Supplement

10
CBSE

INFORMATION TECHNOLOGY

Skill Education | CODE 402

Based on 2024-25 Curriculum

Based on Windows & LibreOffice

Subject
Specific Skills

ORANGE

SUPPLEMENT

10 CBSE

INFORMATION TECHNOLOGY

CODE 402 | Skill Education

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<Roll No.> .....</Roll No.> <Age> .....</Age>

<School> .....

.....</School>

Based on Windows & LibreOffice

ORANGE

Published by:

Orange Education

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New Delhi-110002

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Website: www.orangeeducation.in

IE Code: 0511063121

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SYLLABUS

INFORMATION TECHNOLOGY (CODE – 402)

JOB ROLE: DOMESTIC DATA ENTRY OPERATOR

CLASS – X

Total Marks: 100 (Theory-50 + Practical-50)

Domestic Data Entry Operator in the IT-ITeS Industry is also known as Data Entry Operator. Individuals are responsible to provide daily work reports and work on daily hour bases. The individual is responsible for electronic entry of data from the client side to the office site or vice-versa. Individual tasks vary depending on the size and structure of the organization. This job requires the individual to have a thorough knowledge of various technology trends and processes as well as have updated knowledge about database management systems and IT initiatives. The individual should have fast and accurate typing/data encoding. This job involves working in a personal computer, and appropriate software to enter accurate data regarding different issues like retrieving data from a computer or to a computer.

Course Outcome

On completion of the course, students should be able to:

- Apply effective oral and written communication skills to interact with people and customers;
- Identify the principal components of a computer system; Demonstrate the basic skills of using computer;
- Demonstrate self-management skills;
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- Work safely on the computer.
- Start the computer.
- Open and use the related software.
- Exit from the software.
- Shut down the computer.
- Use the computer for data entry process.
- Collect all necessary information about the query.
- Log any decision about the query on the data entry tracking form.
- Follow Rules and guidelines for data entry.
- Handle queries.
- Undertake data entry with speed and accuracy.
- Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.

Course Objectives

In this course, the students will be introduced to the fundamental concepts of digital documentation, digital spreadsheet, digital presentation, database management and internet security.

The following are the main objectives of this course:

- To familiarize the students with the world of IT and IT enabled services.
- To provide in-depth training in use of data entry, internet and internet tools.
- To develop practical knowledge of digital documentation, spreadsheets and presentation.
- To enable the students to understand database management systems and have updated knowledge about digital record keeping.
- To make the students capable of getting employment in Private Sector, Public Sector, Ministries, Courts, House of Parliament and State Legislative Assemblies.
- To develop the following skills:
  - ★ Data Entry and Keyboarding skills
  - ★ The concept of Digital Presentation
  - ★ The concept of Databases
  - ★ The concept of Digital Documentation
  - ★ The concept of Electronic Spreadsheet
  - ★ Internet Technologies

Salient Features

To be a data entry operator/analyst, one requires a lot of hard work and practical hands-on experience. One should have an intensive knowledge of Office applications, computer operations, and knowledge of clerical, administrative techniques and data analysis. Along with this, as a data entry operator/analyst, you will be expected to have fast typing speed, accuracy, and efficiency to perform tasks.

As a data entry operator/analyst, one should improve their computer skills, numerical and literacy skills. These skills can help one expand into a new career path in the future

SCHEME OF UNITS

This course is a planned sequence of instructions consisting of units meant for developing employability and vocational competencies of students of Class X opting for skill subject along with other subjects.

The unit-wise distribution of hours and marks for class X is as follows:

	UNITS	NO. OF HOURS for Theory and Practical		MAX. MARKS for Theory and Practical
PART A	**Employability Skills**			
	Unit 1: Communication Skills-II	10		2
	Unit 2: Self-Management Skills-II	10		3
	Unit 3: ICT Skills-II	10		1
	Unit 4: Entrepreneurial Skills-II	15		3
	Unit 5: Green Skills-II	05		1
	Total	**50**		**10**
PART B	**SUBJECT SPECIFIC SKILLS**	**Theory**	**Practical**	**Marks**
	Unit 1: Digital Documentation (Advanced)	12	18	8
	Unit 2: Electronic Spreadsheet (Advanced)	15	23	10
	Unit 3: Database Management System	18	27	12
	Unit 4: Maintain Health, Safety and Secure Working Environment	15	22	10
	Total	**60**	**90**	**40**
PART C	**PRACTICAL WORK**			
	Practical Examination			20
	• Advanced Documentation	5 Marks		
	• Advanced Spreadsheets	5 Marks		
	• Databases	10 Marks		
	• Viva Voce	10 Marks		10
	Total			**30**
PART D	**PROJECT WORK/FIELD VISIT** Any Interdisciplinary Real World Case Study to be taken. Summarized data reports of same can be presented in base. Input should be taken using forms and output should be done using reports using base. Documentation of the case study should be presented using writer.			10
	PORTFOLIO/ PRACTICAL FILE: (Portfolio should contain printouts of the practical done using Writer, Calc and Base with minimum 5 problems of each)			10
	Total			**20**
	GRAND TOTAL	**200**		**100**

EMPLOYABILITY SKILLS

UNIT	LEARNING OUTCOMES	THEORY	PRACTICAL
COMMUNICATION SKILLS – II	1. Demonstrate knowledge of various methods of communication	1. Methods of communication • Verbal • Non-verbal • Visual	1. Writing pros and cons of written, verbal and non-verbal communication 2. Listing do's and don'ts for avoiding common body language mistakes
	2. Provide descriptive and specific feedback	1. Communication cycle and importance of feedback 2. Meaning and importance of feedback 3. Descriptive feedback - written comments or conversations 4. Specific and non-specific feedback	1. Constructing sentences for providing descriptive and specific feedback
	3. Apply measures to overcome barriers in communication	1. Barriers to effective communication – types and factors 2. Measures to overcome barriers in effective communication	1. Enlisting barriers to effective communication 2. Applying measures to overcome barriers in communication
	4. Apply principles of communication	1. Principles of effective communication 2. 7 Cs of effective communication	1. Constructing sentences that convey all facts required by the receiver 2. Expressing in a manner that shows respect to the receiver of the message 3. Exercises and games on applying 7Cs of effective communication
	5. Demonstrate basic writing skills	1. Writing skills to the following: • Sentence • Phrase • Kinds of Sentences • Parts of Sentence • Parts of Speech • Articles • Construction of a Paragraph	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject
SELF-MANAGEMENT SKILLS – II	1. Apply stress management techniques	1. Meaning and importance of stress management 2. Stress management techniques – physical exercise, yoga, meditation 3. Enjoying, going to vacations and holidays with family and friends 4. Taking nature walks	1. Exercises on stress management techniques – yoga, meditation, physical exercises 2. Preparing a write-up on an essay on experiences during a holiday trip
	2. Demonstrate the ability to work independently	1. Importance of the ability to work independently 2. Describe the types of self-awareness 3. Describe the meaning of self-motivation and self-regulation	1. Demonstration on working independently 2. goals 3. Planning of an activity 4. Executing tasks in a specific period, with no help or directives 5. Demonstration on the qualities required for working independently

INFORMATION AND COMMUNICATION TECHNOLOGY SKILLS – II	1. Distinguish between different operating systems	1. Classes of operating systems 2. Menu, icons and task bar on the desktop 3. File concept, file operations, file organization, directory structures, and file-system structures 4. Creating and managing files and folders	1. Identification of task bar, icons, menu, etc. 2. Demonstration and practicing of creating, renaming and deleting files and folders, saving files in folders and sub-folders, restoring files and folders from recycle bin
	2. Apply basic skills for care and maintenance of computer	1. Importance and need of care and maintenance of computer • Cleaning computer components • Preparing maintenance schedule • Protecting computer against viruses • Scanning and cleaning viruses and removing SPAM files, temporary files and folders	1. Demonstration of the procedures to be followed for cleaning, care and maintenance of hardware and software
ENTREPRENEURIAL SKILLS- II	1. List the characteristics of successful entrepreneur	1. Entrepreneurship and society 2. Qualities and functions of an entrepreneur 3. Role and importance of an entrepreneur 4. Myth about entrepreneurship 5. Entrepreneurship as a career option	1. Writing a note on entrepreneurship as career option 2. Collecting success stories of first generation and local entrepreneurs 3. Listing the entrepreneurial qualities – analysis of strength and weaknesses 4. Group discussion of self-qualities that students feel are needed to become successful entrepreneur 5. Collect information and related data for a business 6. Make a plan in team for setting up a business
GREEN SKILLS – II	1. Demonstrate the knowledge of importance, problems and solutions related to sustainable development	1. Definition of sustainable development 2. Importance of sustainable development 3. Problems related to sustainable development	1. Identify the problem related to sustainable development in the community 2. Group discussion on the importance of respecting and conserving indigenous knowledge and cultural heritage 3. Discussion on the responsibilities and benefits of environmental citizenship, including the conservation and protection of environmental values 4. Preparing models on rain water harvesting, drip / sprinkler irrigation, vermin-compost, solar energy, solar cooker, etc.

SUBJECT SPECIFIC SKILLS

UNIT	LEARNING OUTCOMES	THEORY	PRACTICAL
DIGITAL DOCUMENTATION (ADVANCED)	ApplyStyles in the document	• Styles/ categories in Writer • Styles and Formatting window • Using Fill Format. • Creating and updating new style from selection • Load style from template or another document. • Creating a new style using drag-and-drop. • Applying styles.	• List style categories in Writer. Select the style from the Styles and Formatting window. • Use Fill Format to apply a style to many different areas quickly. • Create and update a new style from a selection. • Load a style from a template or another document. • Create a new style using drag-and drop.
	Insert and use images in document	• Options to insert image to document from various sources. • Options to modify, resize, crop and delete an image. • Creating drawing objects, setting or changing its properties. Resizing and grouping drawing objects. • Positioning image in the text.	• Insert an image to document from various sources. • Modify, resize, crop and delete an image. • Create drawing objects • Set or change the properties of a drawing object • Resize and group drawing objects • Position the image in the text
	Create and use template	• Templates in Writer. • Using predefined templates. • Creating a template. • Set up a custom template. • Using a template • Changing to a different template. • Updating a Document	• Create a template. • Use predefined templates. • Set up a custom default template. • Update a document. • Change to a different template. • Use the Template. • Update the document.
	Create table of contents	• Table of contents. Hierarchy of headings. Customization of table of contents. • Character styles. Maintaining a table of contents.	• Create a table of contents. • Define a hierarchy of headings. • Customize a table of contents. • Apply character styles. • Maintain a table of contents.
ELECTRONIC SPREADSHEET (ADVANCED)	Analyse data using scenarios and goal seek.	• Using consolidating data. Creating subtotals. • Using "what if" scenarios. Using "what if" tools • Using goal seek and solver.	• Use consolidating data • Create subtotals • Use "what if" scenarios Use "what if" tools • Use goal seek and solver

	Link spreadsheets data	• Setting up multiple sheets. Creating reference to other sheets by using keyboard and mouse.
		• Creating reference to another document by using keyboard and mouse.
		• Relative and absolute hyperlinks
		• Hyperlinks to the sheet.
		  ○ Linking to external data.
		  ○ Linking to registered data sources.
			• Setup multiple sheets by inserting new sheets.
			• Create reference to other sheets by using keyboard and mouse.
			• Create references to other documents by using keyboard and mouse.
			• Create, Edit and Remove hyperlinks to the sheet.
			• Link to external data.
			• Link to registered data source.

	Share and review a spreadsheet	• Setting up a spreadsheet for sharing. • Opening and saving a shared spreadsheet. • Recording changes. • Add, Edit and Format the comments. • Reviewing changes – view, accept or reject changes. Merging and comparing.	• Set up a spreadsheet for sharing. • Open and save a shared spreadsheet. • Record changes. • Add, Edit and Format the comments. • Review changes – view, accept or reject changes. • Merge and compare sheets.
	Use Macros in spreadsheet	• Using the macro recorder. • Creating a simple macro. • Using a macro as a function. • Passing arguments to amacro. • Passing the arguments as values. • Macros to work like built-in functions. • Accessing cells directly. • Sorting the columns using macro.	• Demonstrate the use of a macro recorder. • Create a simple macro. • Use a macro • Pass arguments to a macro • Pass the arguments as values • Write the macros that act like built – in functions • Access cells directly • Sort the columns using macro.

DATABASE MANAGEMENT SYSTEM	Appreciate the concept of Database Management System	• Concept and examples of data and information, • Concept of database, • Advantages of database, • Features of database, • Concept and examples of Relational database, • Concept and examples of field, record, table, database, • Concept and examples of Primary key, composite primary key, foreign key, • Database management system (DBMS) software • Relational Data base management system (RDBMS) software.	• Identify the data and information, • Identify the field, record, table in the database, • Prepare the sample table with some standard fields. • Assign the primary key to the field, • Identify the primary key, composite primary key, foreign key.
	Create and edit tables using wizard and SQL commands	• Introduction to LibreOffice Base • Database objects – tables, queries, forms, and reports of the database, • Terms in database – table, field, record, • Steps to create a table using table wizard • Data types in database., • Option to set primary key Table Data View dialog box	• Start the LibreOffice Base and observe the parts of main window, • Identify the data base objects • Create the sample table in any category using wizard, • Practice to create different tables from the available list and choosing fields from the available fields. • Assign data types of fields, Set primary key, • Edit the table in design view, Enter the data in the fields.
	Perform operations on table	• Inserting data in the table, • Editing records in the table, • Deleting records from the table, • Sorting data in the table, • Referential integrity, • Creating and editing relationships – one to one, one to many, many to many • Field properties	Demonstrate to: • Insert data in the table, • Edit records in the table, • Delete records from table, • Sort data in the table, • Create and edit relationships - one to one, one to many, many to many, • Enter various field properties.
	Retrieve data using query	• Database query, • Defining query, • Query creation using wizard, • Creation of query using design view, • Editing a query, • Applying criteria in query – single field, multiple fields, using wildcard, • Performing calculations, • Grouping of data, • Structured Query Language (SQL).	• Prepare a query for given criteria, • Demonstrate to create query using wizard, and using design view, • Edit a query, • Demonstrate to apply various criteria in query – single field, multiple fields, using wild card, • Performing calculations using query in Base, • Demonstrate to group data, • Use basic SQL commands,
	Create Forms and Reports using wizard	• Forms in BASE. • Creating form using wizard, • Steps to create form using Form Wizard, • Options to enter or remove data from forms • Modifying form, • Changing label, background, • Searching record using Form, • Inserting and deleting record using Form, • Concept of Report in Base, • Creating Report using wizard, • Steps to create a Report using Wizard.	• Illustrate the various steps to create Form using Form Wizard, • Enter or remove data from Forms, • Demonstrate to modify Forms, • Demonstrate to change label, background, • Search record using Form, • Insert and delete record using Form View, • Illustrate the various steps to create Report using Report Wizard, • Demonstrate various examples of Report.

MANAGING HEALTH AND SAFETY	Maintain workplace safety	• Basic safety rules to follow at workplace – Fire safety, • Falls and slips, Electrical safety, Use of first aid. • Case Studies of hazardous situations.	• Practice to follow basic safety rules at workplace to prevent accidents and protect workers ○ Fire safety, • Falls and slips, Electrical safety, Use of first aid.
	Prevent Accidents and Emergencies	• Accidents and emergency, • Types of Accidents, • Handling Accidents • Types of Emergencies.	• Illustrate to handle accidents at workplace, • Demonstrate to follow evacuation plan and procedure in case of an emergency.
	Protect Health and Safety at work	• Hazards and sources of hazards, • General evacuation procedures, • Healthy living.	• Identify hazards and sources of hazards, • identify the problems at workplace that could cause accidents, • Practice the general evacuation procedures in case of an emergency.

Content from Existing Book

New	Unit / Sub Unit	Old	Page No
Part A	Employability Skills		17–121
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Unit 2	Self-Management Skills-II	**Unit 2**	49-65
Unit 3	ICT Skills-II	**Unit 3**	66-90
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Unit 5	Green Skills-II	**Unit 5**	107-120
Part B	Subject Specific Skill		
Unit 4	Managing Health & Safety	**Unit 4**	373-380

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Part B: Subject Specific skills

UNIT

1

Digital Documentation (Advanced)

TOPICS COVERED

- Styles
- Using Drawing Toolbar
- Create and Use Template
- Create and Customise Table of Contents
- Insert and Use Images
- Positioning of a Graphic
- Track Change Feature

In class IX, you learned how to create, format, and edit documents in LibreOffice Writer. In today's world, a professionally styled document is highly valued. There are two ways to create an attractive digital document in Writer: manual formatting or applying styles.

You learned manual formatting by selecting parts of a document, such as pages, paragraphs, or words, and then applying formatting effects using the Text Formatting toolbar. To ensure consistency in formatting different sections with the same style, you had to repeat the steps for each part of the document. Thus, any changes to formatting required repeating the entire process throughout the document.

Manual formatting is popular because it is easy to use and requires less expertise. However, creating a large report with consistent formatting becomes difficult with manual formatting. To avoid inconsistencies and reduce the time and effort spent on formatting a document, we use Styles in Writer.

In this chapter, you will learn how to style a document by using style formats, creating new styles, updating styles, applying styles, and using templates to format the current document.

STYLES

A style is a collection of different formatting saved by a specific name and then applied to different sections of the documents containing text, tables, lists, etc. It saves your time of selecting different sets of formats when working on a long document.

Let us assume that the science teacher has given you a project called “Say No To Single Use Plastic” to be made in LibreOffice Writer. You need to use Font-Algerian, Font Size-20, Colour-Dark Blue, Underline, Bold for the main title. Then for the normal content you want to keep Font-Arial, Size-14, Colour-Black. For the subheadings you want to keep Font- Times New Roman, Size=16, Colour-Grey. With so many variations, such formatting in a project is time-consuming and requires a lot of patience.

Styles help you save your set of formats with a specific name. Whenever a set of formats is needed in a document, using a specific style name helps you accomplish the same set of tasks.

LibreOffice Writer supports different types of styles as given below:

- **Paragraph styles:** They are used for formatting the paragraphs such as text alignment, tab stops, line spacing, and borders, and can include character formatting. Once the page format is decided, the next step is to organise the document content into paragraphs. A paragraph begins and ends by pressing the Enter key.

- **Character styles:** They are used for selected text in a paragraph. It includes font name, font size, bold, italics, underline, superscript, subscript, etc. By using character styles, you can change the appearance of a part of a paragraph without affecting the other part.
- **Frame styles:** Frames are used to format images and text within a document, including features such as borders, backgrounds, and columns. By using frames, a document can be organised into sections, allowing each section to have a distinct appearance. Frames act as containers that can hold text, graphics, and lists.
- **Page styles:** They are used for formatting the pages. It includes margins, headers and footers, borders and backgrounds. A document can have one or many page styles. If a page style is not specified, Writer uses its built-in default page style.
- **List Styles**: They are used for determining the appearance of bulleted or numbered lists, including the type of bullets or numbering, indentation, and spacing.
- **Table Styles:** They are used for determining the appearance of tables, including borders, shading, alignment, and text formatting within table cells.

Using Styles in a Document

Suppose, a user wants to keep the heading aligned to centre in uppercase and blue colour with larger font in several pages of a document. In normal case, he has to apply each of the formatting options (alignment, font, colour) each time on the repetitive content, thus making the process lengthy. But when the related formatting commands are stored in a 'Style', he can apply that 'style' on each selected content to apply all actions at one go.

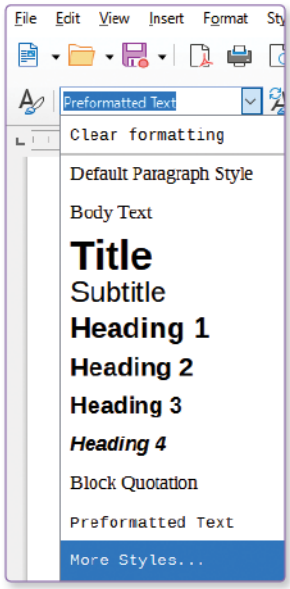
Predefined Heading style(s) act as bookmarks in a document. These bookmarks allow faster browsing in a document.

There are two ways to apply an existing style:

- By using Style pane
- By using Fill Format Mode

The Style Pane

In LibreOffice Writer, Styles pane is used to apply, create, edit, add and remove formatting styles. To apply a style using Styles pane, follow the given steps:



Step 1: Select the text on which you want to apply a style.

Step 2: Click on **Show the Styles Sidebar** icon present on the left corner of the **Formatting (Styles)** toolbar. If the toolbar is not visible then, click on View → Toolbars, and enable → **Formatting (Styles)**.

OR

Click on **Set Paragraph Style** drop-down list at the left end of the **Formatting** toolbar or **Formatting (Styles)** toolbar and click on the **More Styles** option.

OR

Click the **Manage Styles** option from the **Styles** menu in the menu bar.

OR

Click the **Styles** option from the **View** menu in the menu bar.

OR

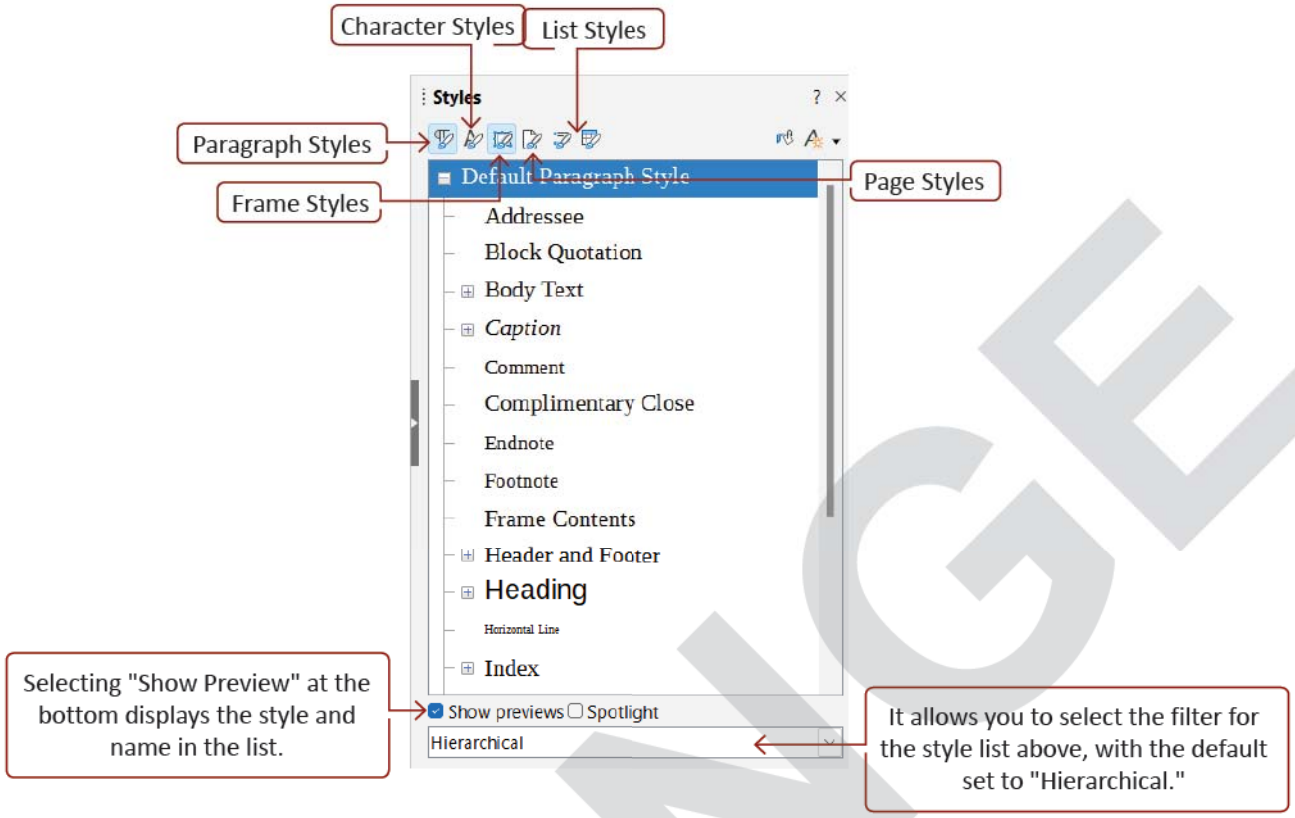
Click the **Styles** icon in the **Sidebar.**

SHORT KEY

To open Styles pane:

F11

The **Styles** pane will open.



Step 3: Select the **Character Styles** icon in the **Styles** pane.

Step 4: Out of the list of **Character Style** displayed, select the **Caption Characters** option. The style will be applied to the text category.

Fill Format Mode

You can apply style quickly by clicking on the **Fill Format Mode** icon ( ) present in the right top corner of the **Style** pane.

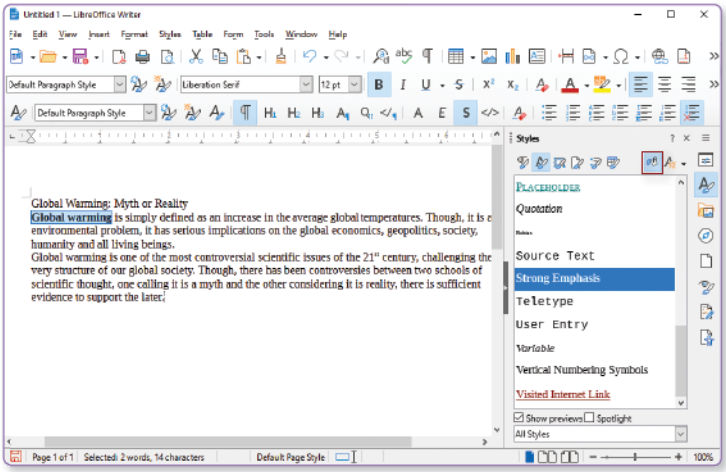
Fill format copies the style of an existing content and then applies to the area selected after that. It is basically a shortcut for applying style. You copy the style using **Fill Format Mode** and then apply it to many scattered characters, paragraphs, lists, etc. in a document.

To apply Styles using Fill Format Mode, follow the given steps:

Step 1: Select the text that has the formatting you want to copy.

Step 2: Open the **Styles** pane. It shows the style that is applied to selected text. Let us take the example of Character Styles—**Strong Emphasis**.

Step 3: Click the **Fill Format Mode** icon present in the right corner of the **Style** pane. This will copy the style.



Now, your cursor will change to a paintbrush icon, indicating that the Fill Format Mode is active.

Step 4: Click on the text where you want to apply the same formatting. The style is copied to the selected text.

You may repeat this step to apply the same style to some other section of the document.

Step 5: Click on **Fill Format Mode** icon again in the **Style** pane to deactivate this mode or press the Esc key.

Creating a New Style

Sometimes we need to apply a style which is not available in the already created style lists. At that time, we can create a new style with our choice of group of formats and save it by a specific name. This newly created user-defined style format will be available only for the current document and cannot be used in some other file because it is not saved in the Style pane.

There are two methods of creating new style which are as follows:

- Creating New Style from the Selection
- Creating New Style by Drag and Drop Method

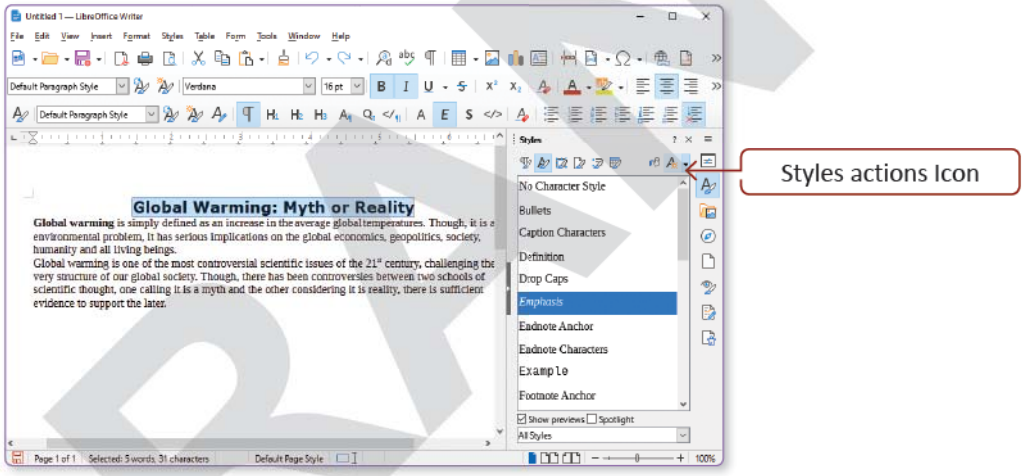
Creating New Style from the Selection

To create a new style, follow the given steps:

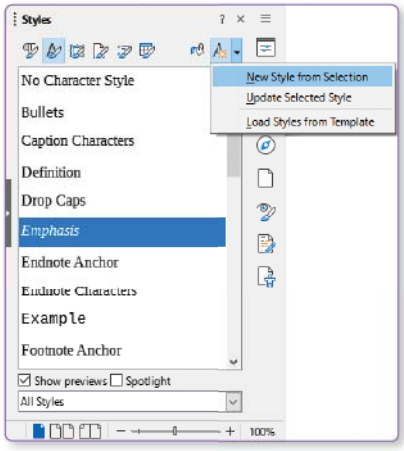
Step 1: Select the text.

Step 2: Apply a group of formats like Font Type: Verdana, Size:16, Font Style: Bold.

Step 3: Open the **Styles** pane and click on **Styles actions** icon.



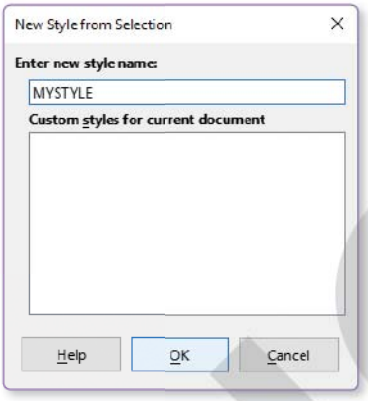
Step 4: Click on the **New Style from Selection** option.



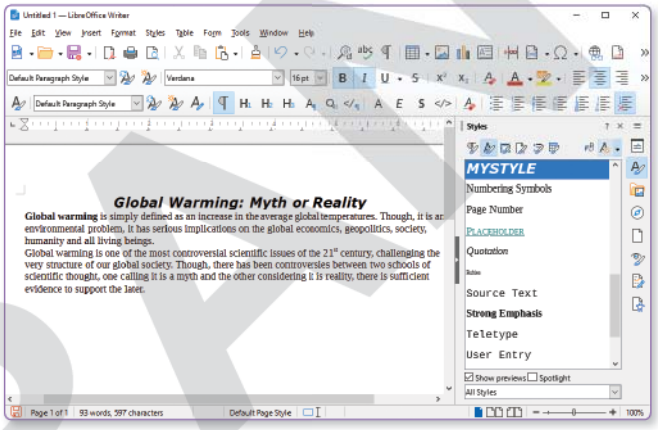
The **New Style from Selection** dialog box opens.

Step 5: Give a new name to this newly created style. Here, we entered **MYSTYLE**.

Step 6: Click on **OK** button to save the style.



Now, the newly create style is displayed in the list in **Style** pane, as shown below:

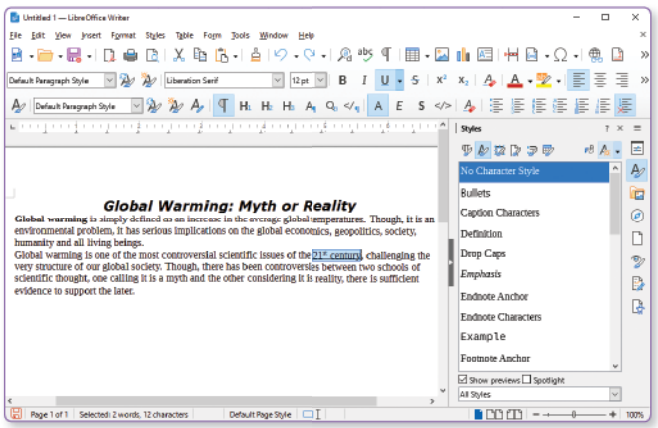


Creating New Style by Drag and Drop Method

The steps to use drag and drop methods are as follows:

Step 1: Open the **Styles** pane.

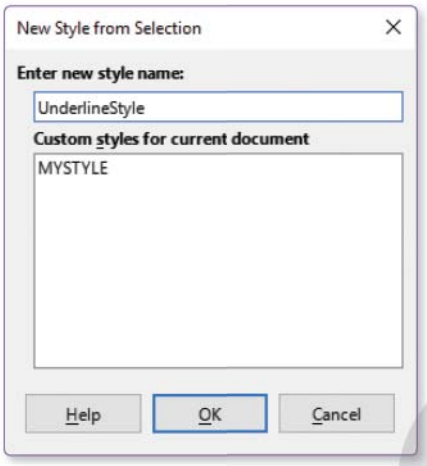
Step 2: Select the text whose style you wish to copy.



Step 3: Drag the text towards **Style** pane. It will open the **New Style from Selection** dialog box.

Step 4: Type new name for the style. Here, we typed **UnderlineStyle**.

Step 5: Click on **OK** button to save it.



Now, the newly create style is displayed in the list in **Style** pane.

To update an existing style, choose the style name from the list. So same method can be used to create or update a style. Drag and drop cannot be used to create a Page style.

Modifying Style

Both the types of styles whether user-defined or predefined, can easily be modified in LibreOffice Writer. Any modification you do in an existing style will be applicable only in the current document. If you wish to apply the changes in other documents, then you need to do the modification in the template or you can copy the modified style into the other documents.

The two different ways used to modify styles which are as follows:

I. Updating a style from a selection

To do this, follow the given steps:

Step 1: Select the text whose style you want to modify.

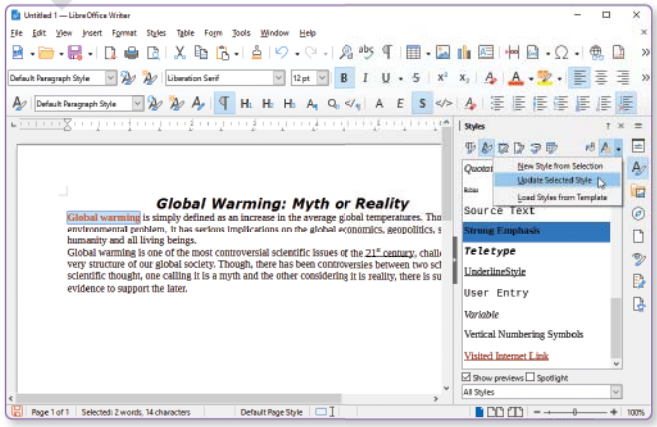
Step 2: Open the **Styles** pane.

The applied style is automatically selected in the **Styles** pane.

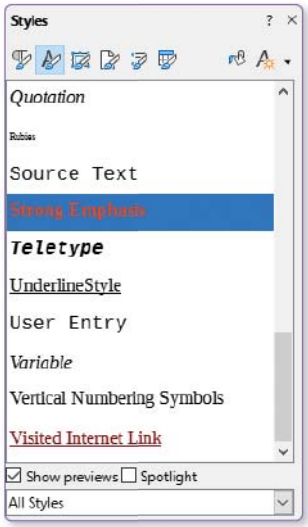
Step 3: Modify the formatting of the selected text.

Step 4: Click on **Styles actions** icon.

Step 5: Select the **Update Selected Style** option from the drop-down list.



The existing style, Strong Emphasis will be updated with new formatting.



II. Load or copy styles from another document or template

It is used to copy styles from an existing template or document. Once copied, in the list of styles, you can create a new document with the same appearance as the existing one. To do this, follow the given steps:

Step 1: Open the **Styles** pane.

Step 2: Click on **Styles actions** icon.

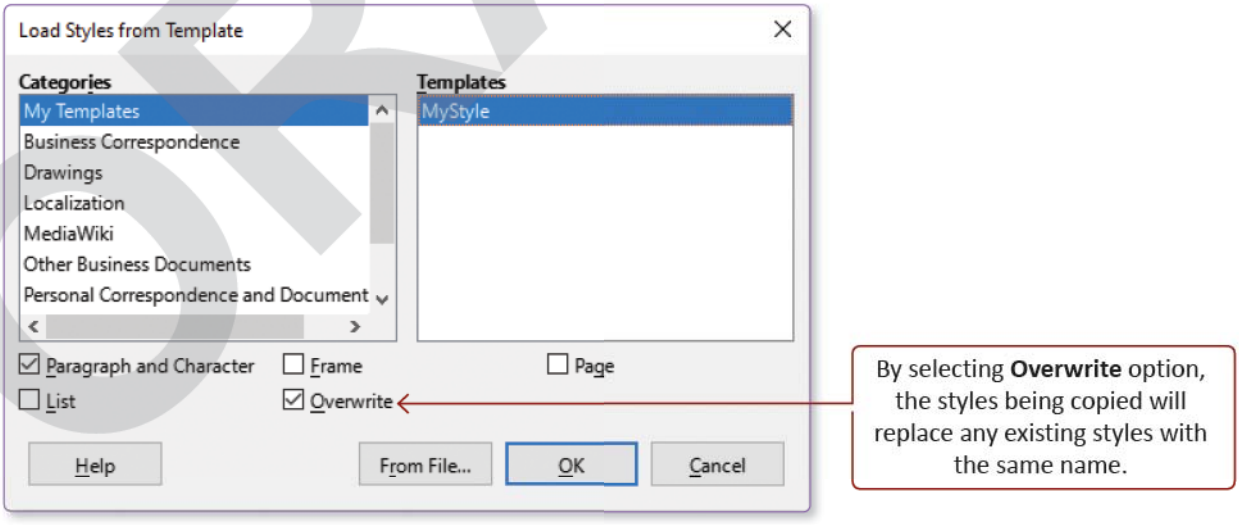
Step 3: Select the **Load Styles from Template** option from the drop-down list.

The **Load Styles from Template** dialog box appears.

Step 4: Select the categories of styles to be copied.

Step 5: Select **Overwrite** if we want the styles being copied to replace any styles of the same names in the document we are copying them into.

Step 6: Click the **OK** button.



If you need to copy styles from a file, then select the **From File** button in the **Load Styles from Template** dialog box instead of the **Template** option. This action prompts an **Open** dialog box where you can pick the desired document from your computer.

Note that whenever a new document is created, the Writer applies default style(s) to it, and the same is displayed in the status bar. It depends on you whether you wish to retain the default style or change it.

INSERT AND USE IMAGES

A well-designed interactive document is simple to read and understand. A word processing application includes many capabilities that allow you to create interactive documents. A document with graphics is usually easier to grasp than a plain written document. Images are available in various forms like drawing, charts, photos, logos, or graphs, which communicate information in a highly efficient manner because our brains can understand and recognise visual information much faster as compare to text or other forms of data. In digital documents, these visual information or images serve as powerful tools for conveying information, enhancing understanding, and engaging readers.

A picture is a digital image, which is represented in finite set of digital values 0 or 1, known as pixels. This digital image, can be downloaded from the internet, scanned using a scanner, picture taken using a digital camera, or create an image using any image software. All these forms of digital images are stored in various types of graphics files with the file extension, such as GIF, JPG, JPEG, PNG, BMP, etc. and can easily be used in LibreOffice Writer.

Inserting an Image File

LibreOffice Writer allows to work on images, shapes, charts and diagrams by providing various tools. The image file saved in a computer can be inserted using any of the given methods:

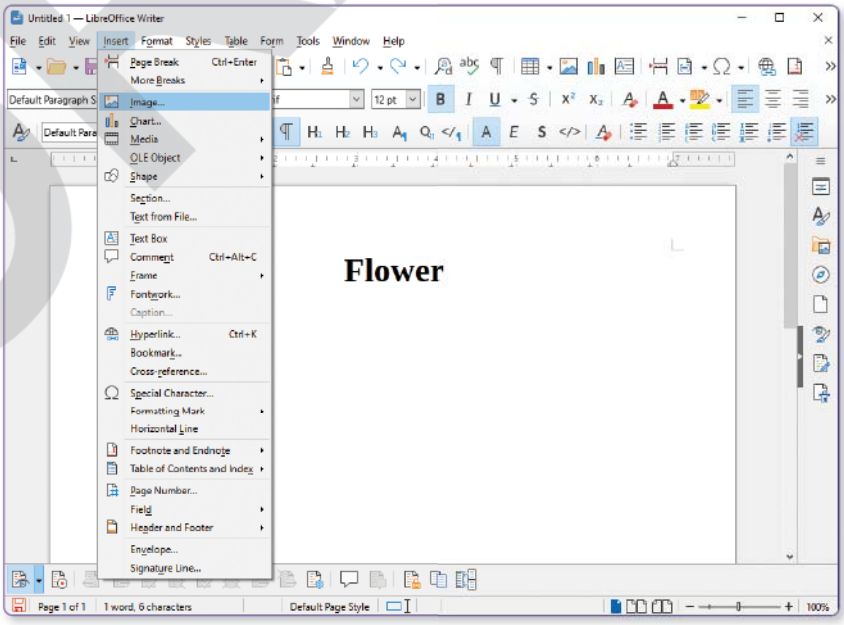
- Inserting an image using Insert menu
- Inserting an image using Drag and Drop method
- Inserting an image using Copy and Paste option
- Inserting an image using a scanner
- Inserting an image by linking
- Inserting an image from LibreOffice gallery

Using Insert Menu

To insert image using Insert menu, follow the given steps:

Step 1: Open the document in which you wish to insert an image.

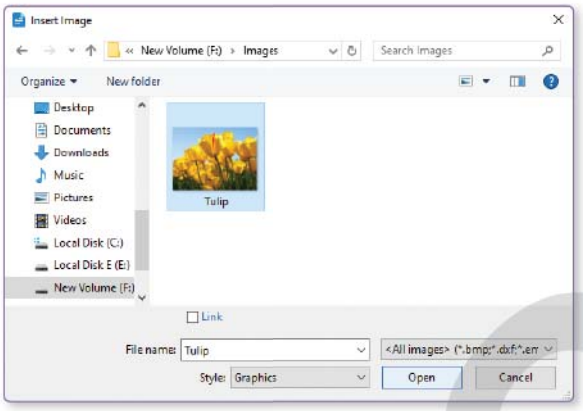
Step 2: Click on **Insert** menu and select the **Image** option.



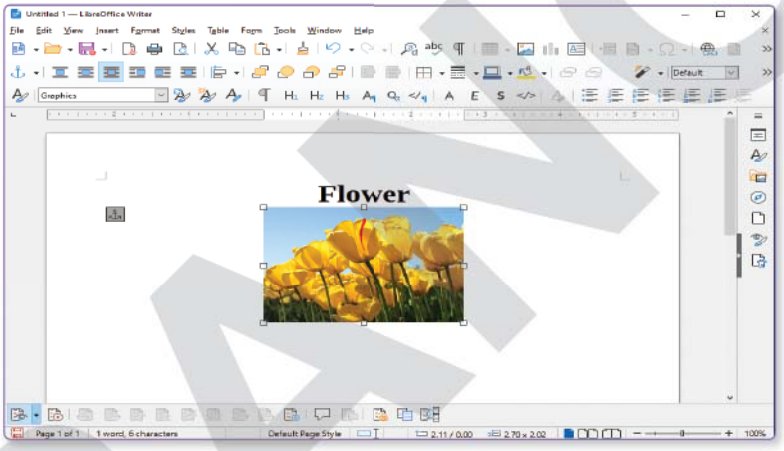
The **Insert Image** dialog box opens.

Step 4: Select a specific folder and subfolder and click on the image file that you wish to insert. In this case, we have selected the **Tulip** image.

Step 5: Click on **Open** button.



The image will be inserted at the desired position.



Notice that the selected image is bordered by eight little squares.

INFO MAIL

Subject: To access the Insert Image dialog box

You can also access the Insert Image dialog box by clicking the **Insert Image** option from the Standard Toolbar.

Using Drag and Drop Method

To insert image using drag and drop method, follow the given steps:

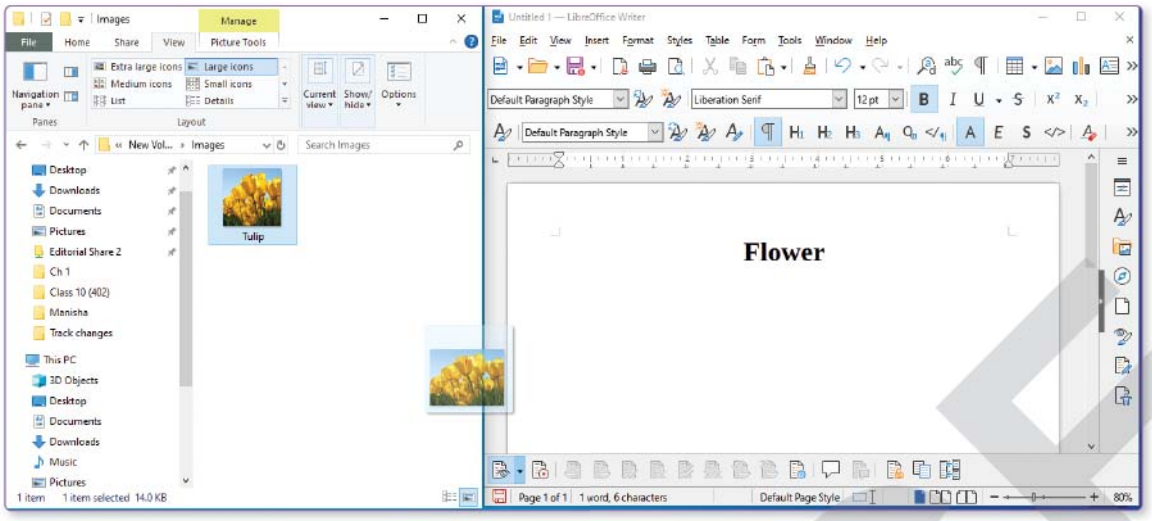
Step 1: Open the document in which you wish to insert an image.

Step 2: Open **File Explorer** and locate the image you want to insert.

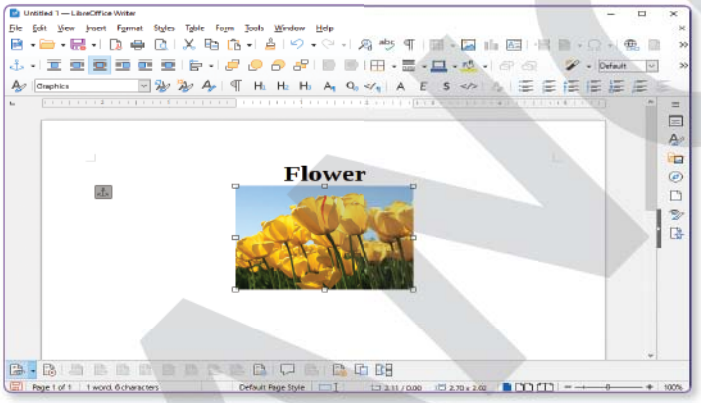
Step 3: Select the file and drag it into the desired place in a document.

SHORT KEY

To open File Explorer:



Step 4: After reaching the desired place, release the left mouse button. You will see the image inserted into that selected place in the document.



Using Copy and Paste Option (Using Clipboard)

To insert image using copy-paste option, follow the given steps:

Step 1: Open the document and select the picture which you wish to copy.

OR

Select the image from the desired location.

Step 2: Click on the **Edit** menu and select the **Copy** option.

The image will be copied to the clipboard.

Step 3: Move to the location where you wish to paste the copied image from the clipboard. Note that if the document is closed before you paste an image then you might lose the image from the clipboard.

Step 4: Click on the **Edit** menu and select the **Paste** option.

SHORT KEY

To copy the content or item

Ctrl + C

SHORT KEY

To paste the copied content or item

Ctrl + P

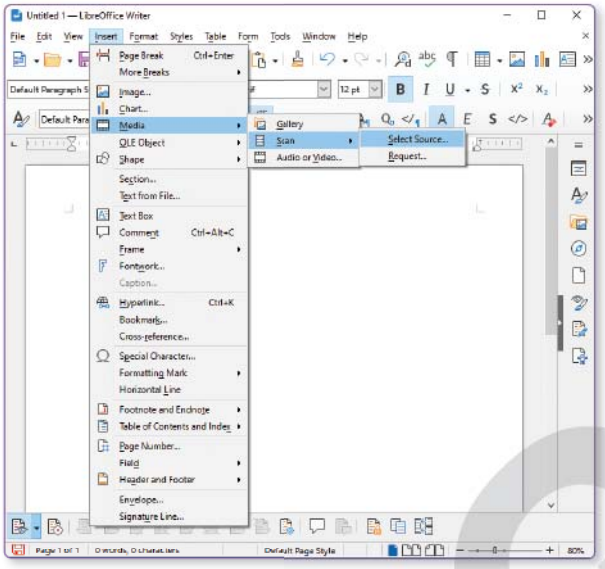
Inserting an Image Using a Scanner

If the scanner is connected to the computer and you wish to insert a scanned image, then this method is the most convenient way of uploading an image and placing it in a document. To do this, follow the given steps:

Step 1: Click on **Insert** menu and select **Media** option. A submenu appears.

Step 2: Select the **Scan** option. A submenu appears.

Step 3: Click on **Select Source** option from submenu.



The **Select Source** dialog box opens.

Step 4: Select the source and then click the **Select** button.

The scanner will be activated and the image will be scanned and uploaded. After this you can place it in the desired location in your document.

INFO MAIL

Subject: To insert picture/image from LibreOffice Draw/Impress:

Step 1: Click in the document where you want to insert the image.

Step 2: Open LibreOffice Draw or Impress document containing the image to be inserted. In this case, we have opened LibreOffice Draw.

Step 3: Select the image in the document.

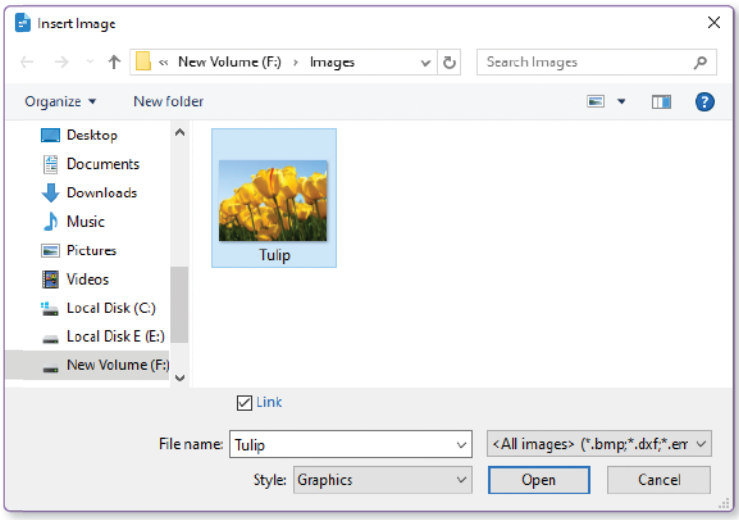
Step 4: Drag image from Draw to Writer.

Inserting an Image by Linking

If you need to put the same picture in a document many times, it's better to save a link to the picture instead of putting the picture directly. When you insert a link, it saves the address of the image instead of the whole image. This reduces the size of the document because it only keeps one copy of the picture in a separate file along with the document.

When you open the document containing the link, the image file is combined with the document where the link was stored and presented to the user.

You can link the image file in the document by clicking the Link check box in the **Insert Image** dialog box, as shown in below figure:



SHORT KEY

To link an image – drag and drop the image while holding the

Ctrl + Shift

From the LibreOffice Gallery

Gallery is a collection of objects like graphics and sound files that can be easily inserted in a document.

The steps to insert an image in the document from Gallery are as follows:

Step 1: Click on **Gallery** icon ( ) present on the Sidebar.

OR

Click on the **View → Gallery** option from the menu bar.

OR

Click on the **Insert → Media → Gallery** option from the menu bar.

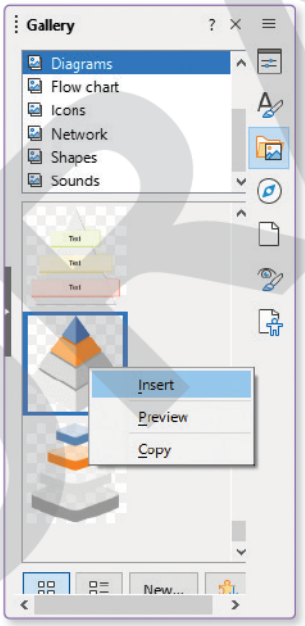
The **Gallery** pane opens.

Step 2: Select the category from the list provided. The images related to the selected category is displayed.

Step 3: Right-click the desired image from the displayed images.

A context menu appears.

Step 4: Click on the **Insert** option from the context menu.



SHORT KEY

To open the Gallery pane:

Alt + 3

OR

Right-click the desired image and click on the **Copy** option from the context menu. Then, paste the copied image in the document.

OR

Select the desired image and then drag and drop to the document.

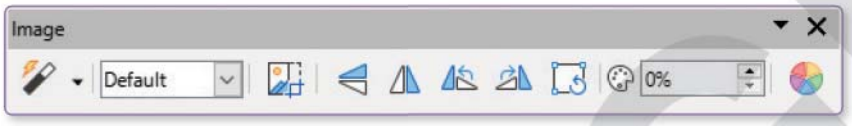
Step 5: Click on the **Gallery** icon in the **Sidebar** to close the **Gallery** pane. Or, click the **Close** (×) button in the Gallery pane.

Modifying an Image

When you insert a new image, you may need to modify it to suit the document. Modifying an image means to make changes in an image like crop, resize, add border, etc. Here we will discuss the use of the Image toolbar for resizing, cropping, and a workaround to rotate a picture.

Using an Image Toolbar

As soon as an image is inserted or selected in a document then the Image toolbar automatically appears on the screen. If in case it is not visible, then go to **View** menu and select the **Toolbars → Image** option. Using the Image toolbar, you can edit the image in different ways.

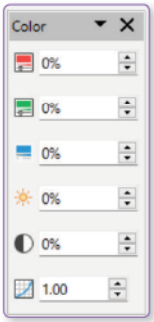


The tools on the Image toolbar are given below:

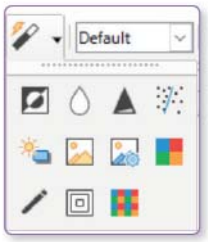
	Filter	It is also known as an image filter bar. It has various filters which can be used on the selected image.
Default	Image Mode	It helps you to change the modes of the image to Grayscale, Black/ White, and Watermark.
	Crop Image	It crops an image. By removing unwanted background elements and create a focus on your desired object in the image.
	Flip Vertically	It flips the selected image vertically by 180 degree.
	Flip Horizontally	It flips the selected image horizontally by 180 degree.
	Rotate 90^0 Left	It rotate the selected image 90 degree to left.
	Rotate 90^0 Right	It rotate the selected image 90 degree to right.
	Rotate	It rotates the image at any degree in any direction.
0%	Transparency	It helps you to change the transparency of the image selected. Useful for creating watermark or making transparent to keep it as a background.
	Color	It helps you edit the colour properties of the image selected. Red, Blue or Green colour can be modified or adjustment for brightness, contrast and gamma can be made.

Using Color Tool

Clicking on the Color button will display the colour drop down list as shown in figure.



It consists of six components in the drop-down list. One can increase or decrease the percentage of these components. The first component represents the three primary colours Red, Green and Blue, respectively. The fourth component represents the Brightness, fifth component represents the Contrast and last sixth component represents the Gamma.



Using Filter Tool

The Filter tool has a drop-down arrow which expands to show various filters that can be applied on the selected picture. The effect of these graphics filters are given below:

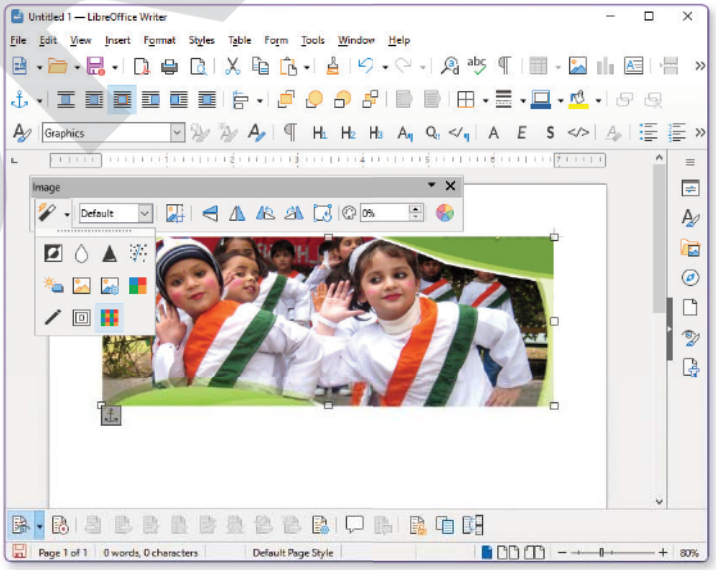
	Invert	For a grayscale it inverts the brightness. For coloured image it inverts the colours.
	Smooth	It softens the contrast of the image.
	Sharpen	It increases the contrast of the image.
	Remove Noise	It removes single pixels from the image.
	Solarization	It makes the image wholly or partially reverse in the tone. Used in photographs. Dark appears light and light appears dark.
	Aging	It brings the impact of time with the age.
	Posterize	It makes the image appear like a poster with less colour combinations.
	Pop Art	It displays the image in the modern art style.
	Charcoal Sketch	It give a charcoal effect to the image.
	Relief	It displays a dialog box to adjust the light source to give a shadow effect.
	Mosaic	It displays the image as a group of pixels.

Follows the given steps to use Filter tool:

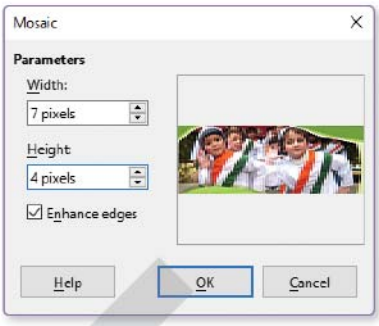
Step 1: Insert an image in a Writer document. The **Image** toolbar appears.

Step 2: Click on the **Filter** tool. A drop-down menu appears containing different icons of filter effects.

Step 3: Click on the desired filter effect. In this case, we have clicked on the **Mosaic** effect.



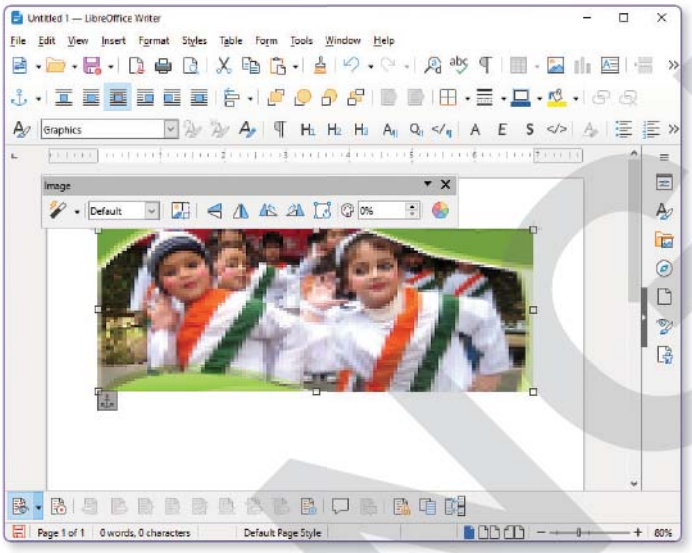
The **Mosaic** dialog box appears.



Step 4: Change the **Height** and **Width** values in the respective boxes.

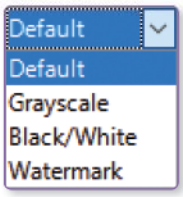
Step 5: Click on the **OK** button.

The **Mosaic** filter will apply on the image.



Using Image Mode Tool

The Image Mode tool helps you change the mode of the image. It contains following options:



- **Default:** It is default displayed and brings no changes to the graphic object.
- **Grayscale:** It changes the image into grayscale.
- **Black/White:** It converts the pixels of the image into black and white depending on the brightness of the pixel.
- **Watermark:** It increases the transparency of the image to give it a watermark effect.

Follow the given steps to use the Image Mode tool:

Step 1: Select the image in the document on which you want to apply Image Mode tool. The **Image** toolbar appears.

Step 2: Click on the **Image Mode** tool. A drop-down menu appears.

Step 3: Select each option one by one and see the effect on the image.

Grayscale

Black/White

Watermark

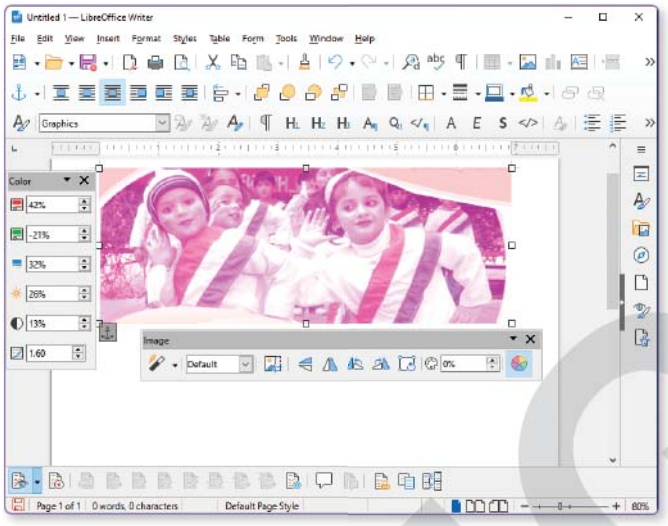
Changing the Image Colours Using Color Tool

Color tool present on the Image toolbar helps you to change the RGB colour combinations along with brightness, contrast, and gamma of the image. Follow the given steps to use the Color tool:

Step 1: Select the image in the Writer document.

Step 2: Click on the **Color** tool from the **Image** toolbar. The **Color** toolbar appears with **Red**, **Green**, **Blue**, **Brightness**, **Contrast**, and **Gamma** options.

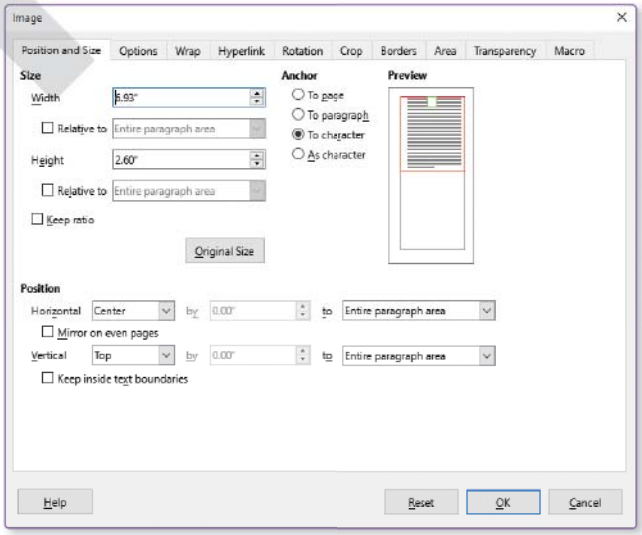
Step 3: Change the values according to your requirement in respective boxes. As you change the value of any option the effect of t he change appears on the image.



Using Image Dialog Box to Edit an Image

We can also edit an image by using the **Image** dialog box. We can open the **Image** dialog box by right-clicking on the image and selecting the **Properties** option or by pressing the **F4** key from the keyboard, as shown below:

It will open an **Image** dialog box as shown below:



The **Image** dialog box has the following tabs that can be used to make different adjustments to the image inserted:

- **Position and size:** Changes the size, position, and anchor of the image.
- **Option:** Assign a name to the image, set the alternative text for mouse hover, and protect image against modifications.
- **Wrap:** Deals with the text around the image as well as the spacing between the image and text.
- **Hyperlink:** Links URL to an image or establish an image map.
- **Rotation:** Flips the image horizontally or vertically as well as rotate the image.
- **Crop:** Crops the image (cut the unwanted portion), scale the image and set its size.
- **Borders:** Add border to the image, format it, and apply shadow on it.
- **Area:** Modifies the background of the image.
- **Transparency:** Specifies the transparency for the image as well as sets the gradient options.
- **Macros:** Assigns macros to the image.

Cropping an Image

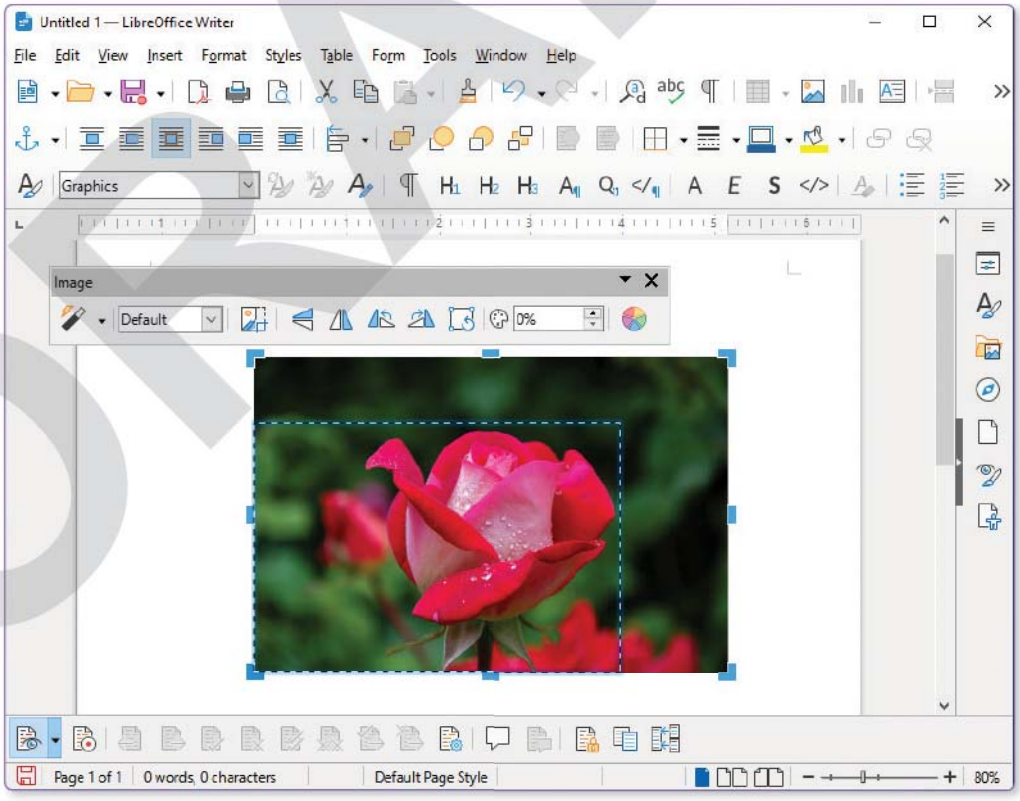
Cropping an image involves removing unwanted portions of the image to focus on a specific area or to improve its composition. It is equivalent to using a scissor to cut the unwanted part. To crop an image, perform the following steps:

Step 1: Select the image in the Writer document.

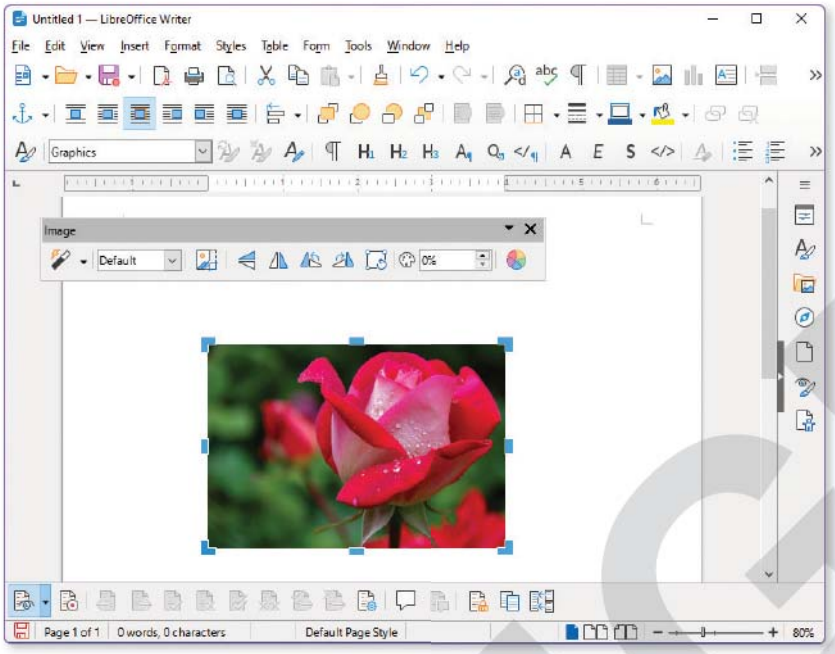
Step 2: Click on the **Crop Image** tool from the **Image** toolbar.

Notice that, the eight little squares surrounding the image will be transformed into blue handles.

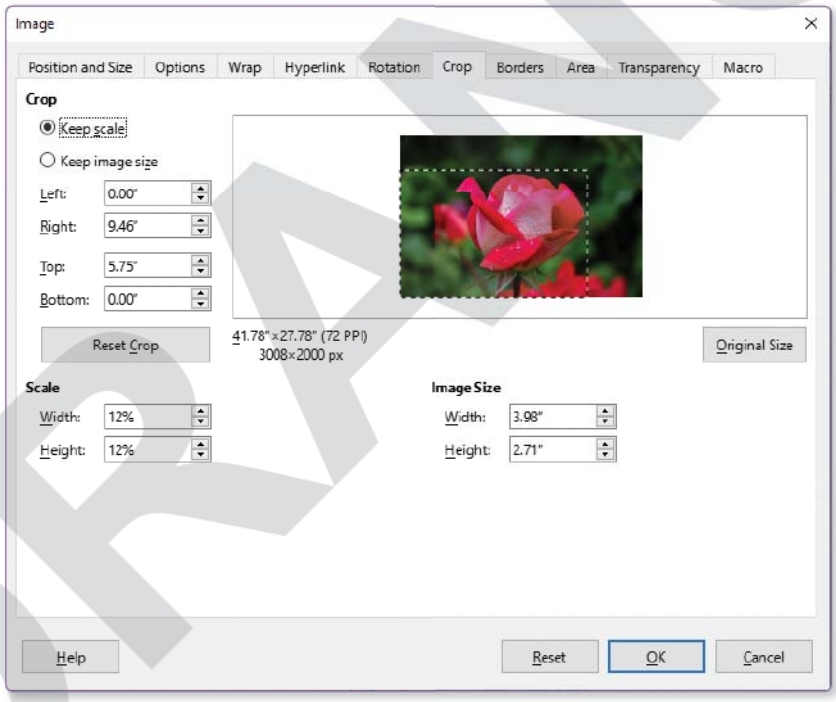
Step 3: Click and drag the handles on the image to adjust the crop region as desired. You can crop from any side or corner, as shown in below figure:



The image is cropped, as shown in below figure:



You can also crop an image by using the Image dialog box, as shown in below figure:



The options available for cropping in the Image dialog box are as follows:

- **Keep Scale:** It means the resizing of an image will not occur when the cropping of an image is done. This will cut the unwanted part of the image without altering its size.
- **Keep image size:** The image size will enlarge when the green handles are dragged towards outwards. The image size will be reduced when dragged towards inwards.
- **Left, Right, Top, and Bottom:** Cropping will occur from left, right, top and bottom by typing the values. These values will work according to the choice made between **Keep scale** and **Keep image size**.
- **Width and Height:** The Width and Height fields are given both for **Scale** and for **Image Size**. You can alter depending on the option selected.

Rotating an Image

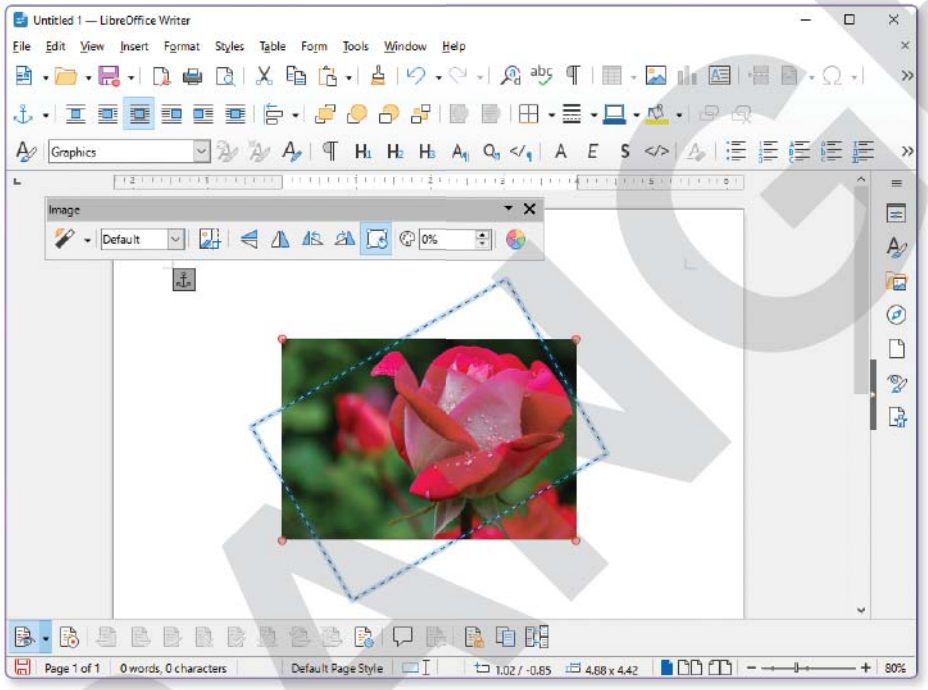
Rotating an image in LibreOffice Writer serves multiple purposes, including alignment for better integration with text, enhancing visual appeal by adding dynamism to the layout, proficiently managing space limitations, drawing attention to specific details within the image, etc. To rotate an image, perform the following steps:

Step 1: Select the image in the Writer document.

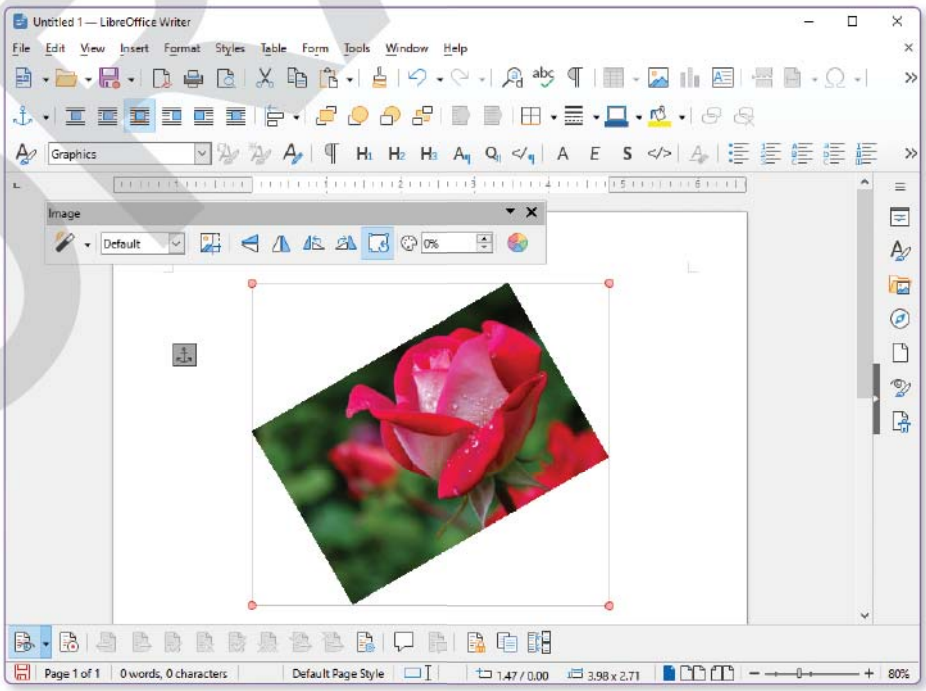
Step 2: Click on the **Rotate** tool from the **Image** toolbar.

Notice that, the four dots (handles) appears surrounding the four corners of the image.

Step 3: Click and drag the handles on the image to rotate an image. You can rotate an image from any handles, as shown below:



The image gets rotated, as shown in the below figure:



Resize an Image

Sometimes an image size is required to be altered in a document either by increasing its size or by decreasing its size. Resizing is the process of reducing or enlarging the size of the image. The resizing of a picture will alter the resolution of a picture. The steps to change the size of the image are as follows:

Step 1: Select the image in the document.

Notice that the selected image is bordered by eight little squares.

Step 2: Place the mouse pointer over one of the square so that it changes to a double headed arrow.

Step 3: Drag the double headed arrow in the direction of resizing the image. If you drag it inwards the size of the image decreases. If you drag it outwards the size of the image increases. By dragging the corner handles, one can resize both the width and the height of the image simultaneously, while the other four handles only resize one dimension at a time.

Step 4: If you wish to keep the original proportions of the picture then press the **Shift** key and click on any one of the corner square and then drag it. After doing the desired change, release the mouse button.

Delete an Image

To delete an image, perform the following steps:

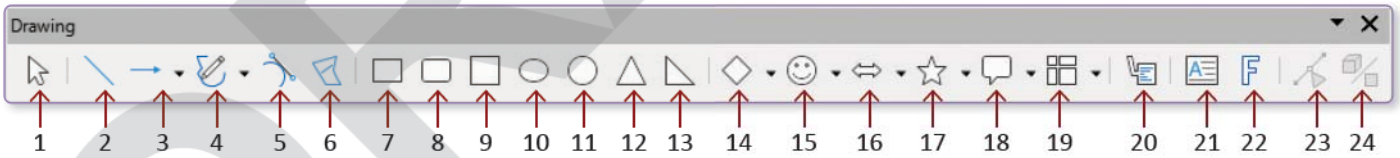
Step 1: Select the image in the document that you want to delete.

Step 2: Press the **Delete** key.

The image is deleted from the document.

USING DRAWING TOOLBAR

The Drawing Toolbar is a collection of tools used for drawing objects and giving effects to these objects. A set of drawing tools available in Writer are easy to use and help in creating good-quality designs, diagrams, and drawings. Once When you create the drawings, you can directly place them in the document. These diagrams can also be copied or imported into other packages. You can open the Drawing toolbar by clicking the **View → Toolbars → Drawing** option from the menu bar. Following are the different tools in the Drawing toolbar:

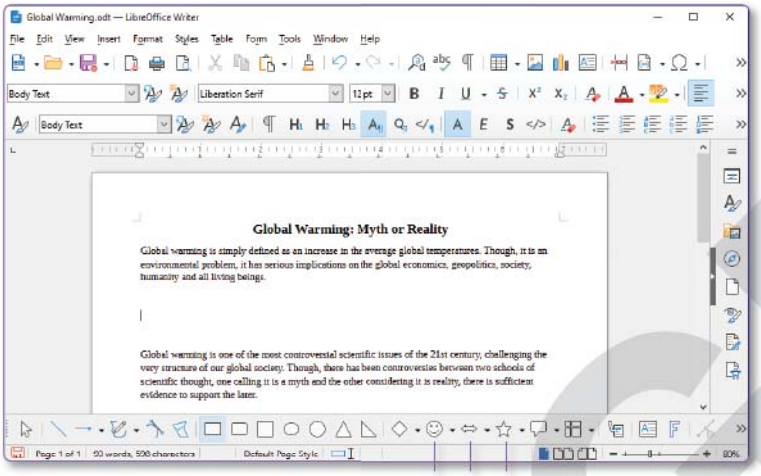


1. Select
2. Insert Line
3. Line and Arrows
4. Curves and Polygons
5. Curve
6. Polygon
7. Rectangle
8. Rectangle Rounded
9. Square
10. Ellipse
11. Circle
12. Isosceles Triangle
13. Right Triangle
14. Basic shapes
15. Symbol shapes
16. Block Arrows
17. Stars and Banners
18. Callouts Shapes
19. Flowcharts
20. Callouts
21. Insert Textbox
22. Insert Fontwork Art
23. Toggle Point Edit Mode
24. Toggle Extrusion

Let us make a rectangle using the Rectangle tool. To do this, perform the following steps:

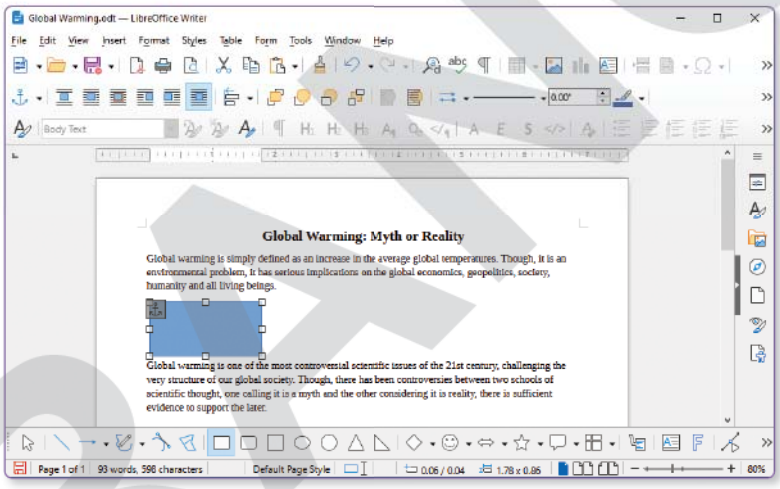
Step 1: Move to the location in the document where you wish to draw a rectangular.

Step 2: Select the **Rectangle** tool from the **Drawing** toolbar.



The mouse pointer changes to a thin plus sign.

Step 3: Drag and then release the mouse button to create a rectangular shape of an appropriate size.



The mouse pointer is still with a thin plus sign which means you can draw as many shapes as you want.

Step 4: Click on the **Select** tool on the Drawing toolbar or press the **Esc** key to get your original mouse pointer shape.

Resizing a Drawing Object

Sometimes you may want to change the size of drawing to accommodate it at a particular place in the document. This can be done either by changing its size only or by changing its shape and size both.

An object drawn using a Drawing toolbar can be resized using two different ways, which are:

- Using Handles of the Object
- Using Format Menu

Using Handles of the Object

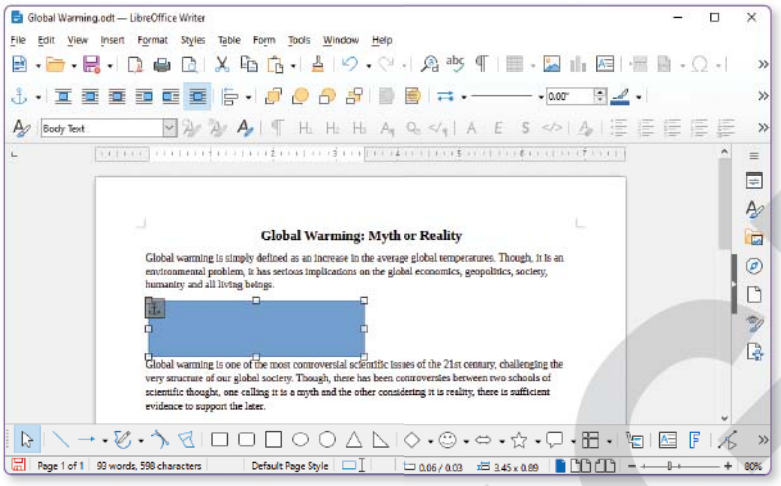
This process is similar to the steps we used to resize an image, which are as follows:

Step 1: Select the object to make it active with the handles (little square) around the edges.

Step 2: Place the mouse pointer over one of the edges so that it changes to a double headed arrow.

Step 3: Drag the double headed arrow in the direction of resizing the object. If you drag it inwards the size decreases. If you drag it outwards the size of the image increases.

Step 4: If you wish to keep the original proportions of the picture then press Shift + click on any one of the corner handles and then drag it. After doing the desired change, release the mouse button.



Using Format Menu

To resize a drawing using Format menu, follow the given steps:

Step 1: Select the object that you want to resize.

Step 2: Click on **Format → Text box and Shapes → Position and Size** option from the menu bar.

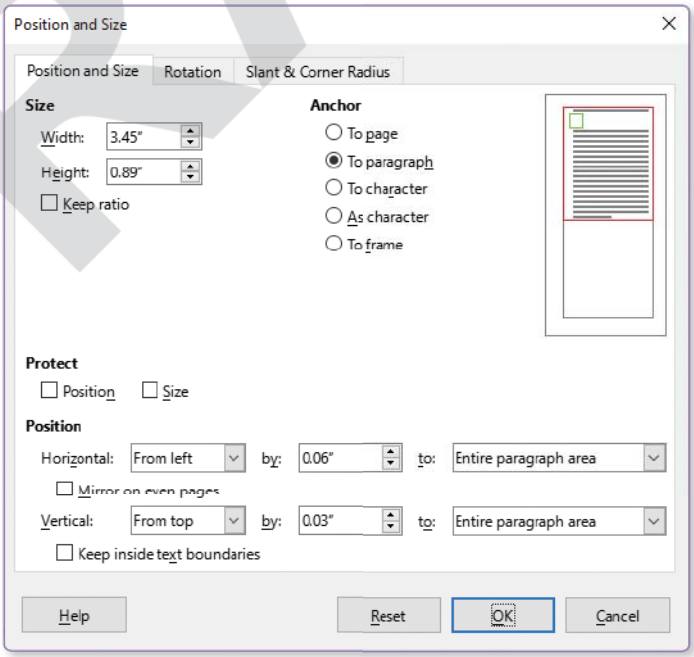
OR

Right-click the object and then select the **Position and Size** option from the context menu.

The **Position and Size** dialog box will appear.

Step 3: Specify the width and height of the object in the **Width** and **Height** text boxes, respectively under the **Size** category.

Step 4: If the **Keep ratio** check box is checked, then the proportion of the object is maintained at the time of resizing.



Find on Google

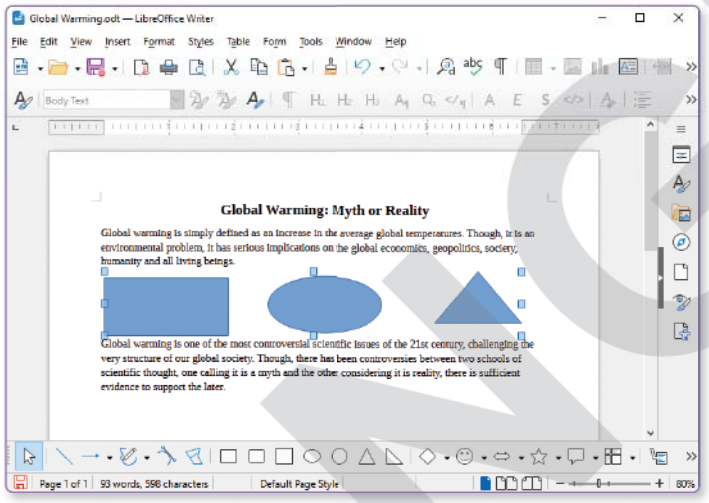
Is the FontWork Gallery available in LibreOffice Writer?

Grouping the Drawing Objects

Grouping of the drawing objects is the process of combining two or more objects to behave as one object. It becomes easier to move, cut or copy the grouped objects. The number of objects grouped can easily be ungrouped.

The steps to group the objects are as follows:

Step 1: Select multiple objects by using mouse click and holding the **Shift** key.



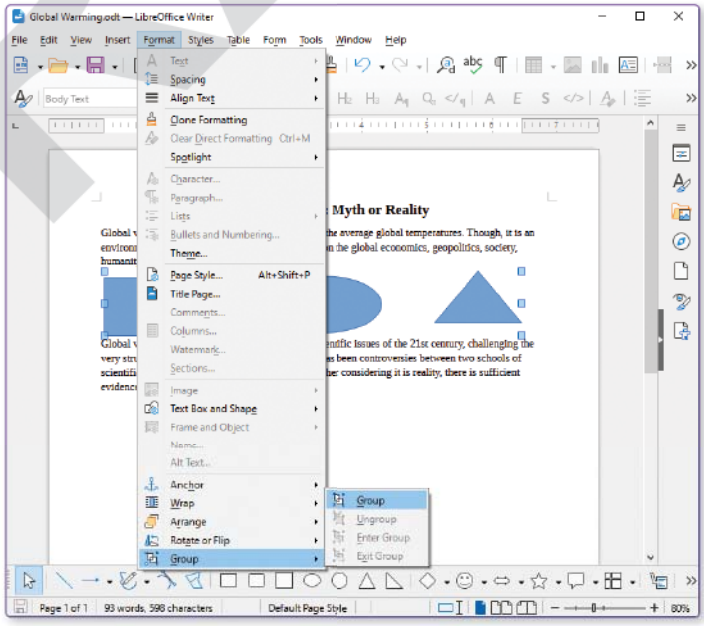
Step 2: Click on the **Format** → **Group** option and then select the **Group** option from the sub menu.

OR

Right-click on the selected objects and then select the **Group** option from the context menu.

OR

Select the **Group** option from the **Drawing Object Properties** toolbar.



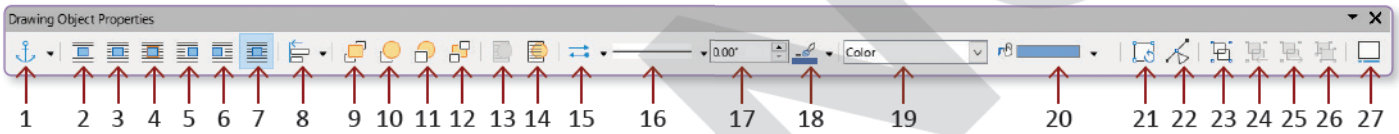
The selected objects get grouped into one object.

In LibreOffice Writer, the options you mentioned relate to working with grouped objects, such as images or shapes.

- **Group:** This option allows you to select multiple objects, such as images or shapes, and group them together as a single object. Once grouped, you can move, resize, or manipulate them as a single entity.
- **Ungroup:** If you've previously grouped objects together and want to edit them individually again, you can use the "Ungroup" option. This separates the grouped objects back into their original individual components.
- **Enter Group:** This option is used to enter the editing mode of a grouped object. When you have a grouped object selected, you can use "Enter Group" to access and edit the individual components of the group.
- **Exit Group:** This option is often used when you're editing objects within a group. When you're inside a grouped object, such as when you've double-clicked on a group to enter it, "Exit Group" allows you to exit the group editing mode and return to the main document editing mode.

Changing Properties For Drawing Objects

Whenever an image or a graphical object is inserted in a document then its properties like colour, contrast, brightness etc. can easily be modified using the Drawing Object Properties toolbar. You can access it by clicking on the **View → Toolbars → Drawing Object Properties** option. It is a floating toolbar, and can be placed anywhere on the screen, as shown in below figure:



1. Select Anchor for Object
2. None
3. Parallel
4. Optimal
5. Before
6. After
7. Through
8. Align Objects
9. Bring to Front
10. Forward One
11. Back One
12. Send to Back
13. To Foreground
14. To Background
15. Arrow
16. Line Style
17. Line Thickness
18. Line Color
19. Area Style/Filling
20. Fill Color
21. Rotate
22. Toggle Point Edit Mode
23. Group
24. Ungroup
25. Enter Group
26. Exit Group
27. Insert Caption

The steps to use the tools from the above toolbar are:

Step 1: Draw a line using a Drawing toolbar.

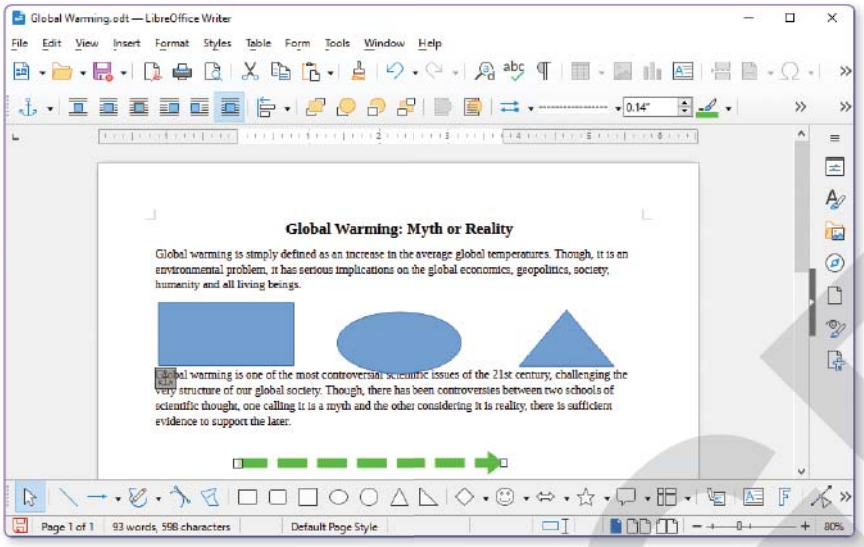
Step 2: Select the line with the square on its edges.

Step 3: Select the **Line Style** tool present on the **Drawing Object Properties** toolbar to change the style of the line. It will display the list of different line styles like dotted, dash, thick, double, etc.

Step 4: Specify the width of the line in the **Line Thickness** text box present on the **Drawing Object Properties** toolbar.

Step 5: Choose the colour for the line in the **Line Color** option on the **Drawing Object Properties** toolbar.

The specified settings are applied to the object, as shown in the below figure:



After the changes are done, click on any other part of the document to remove the square handles from the line drawn. Changes done in properties of an object, before creating it, are available only for current session.

POSITIONING OF A GRAPHIC

Whenever you place any graphic in a document then the given four settings play an important role:

- Anchoring
- Arrangement
- Alignment
- Text wrapping

These settings can be accessed from different ways:

- **For both image and objects:** Click on the **Format** menu in menu bar and then select the **Arrange**, **Wrap**, **Anchor** from the list.
  OR
- **For both image and objects:** Right-click on the graphics in the document and then select the desired option (**Align Objects**, **Arrange**, **Wrap**, **Anchor**) from the context menu.
  OR
- **For both image and objects:** Click on the object and then select the desired option from the **Drawing Object Properties** toolbar.
  OR
- **For Image:** You can use anchor and wrap features of the image from the **Position and Size** and **Wrap** tabs, respectively of the **Image** dialog box. You can access this dialog box by selecting an image and then clicking on the **Format → Image → Properties** option from the menu bar or right-click on the image and select the **Properties** option from the context menu.
  OR
- **For object:** You can anchor the object from the **Position and Size** tab of the **Position and Size** dialog box. You can access this dialog box by selecting an object and then select **Format → Text Box and Shape → Positions and Size** option from the menu bar or right-click on the object and select the **Positions and Size** option from the context menu.

Anchoring

Anchoring refers to the reference point for the graphics. An image always has an anchor point. It specifies the relationship between the graphic and the text surrounding it. Anchoring allows an image to retain its position to a page, paragraph, character or frame. So whenever a page, paragraph, character or frame is aligned, the anchored image moves along with it.

The following anchoring options are available in the LibreOffice Writer:

- **To Page:** The object or image remains in the same position in relation to the page margins. It does not move after adding or deleting text or other images. This method is useful when the object or image is not required to be visually associated with a particular piece of text.
- **To Paragraph:** The object or image is visually associated with a paragraph and moves along the paragraph too. It may be placed in the margin or another location.
- **To Character:** The object or image is associated with a character but is not in the text sequence. It moves with the c but can be placed in the margin or another location.
- **As Character:** The object or image is placed in the document like any other character, and therefore, affects the height of the text line and the line break. The graphic moves with the paragraph as we add or delete text before the paragraph. This method is useful for keeping screenshots in sequence in a procedure (by anchoring them as a character in a blank paragraph) or for adding a small (inline) icon in sequence in a sentence.
- **To Frame:** If the object or image has been placed in a frame, we can anchor the graphic in a fixed position inside the frame. The frame can then be anchored to a page, paragraph or character as required.

When an image is inserted, an anchor icon appears on the left side of image. We can position an anchored item by dragging the item to another location.

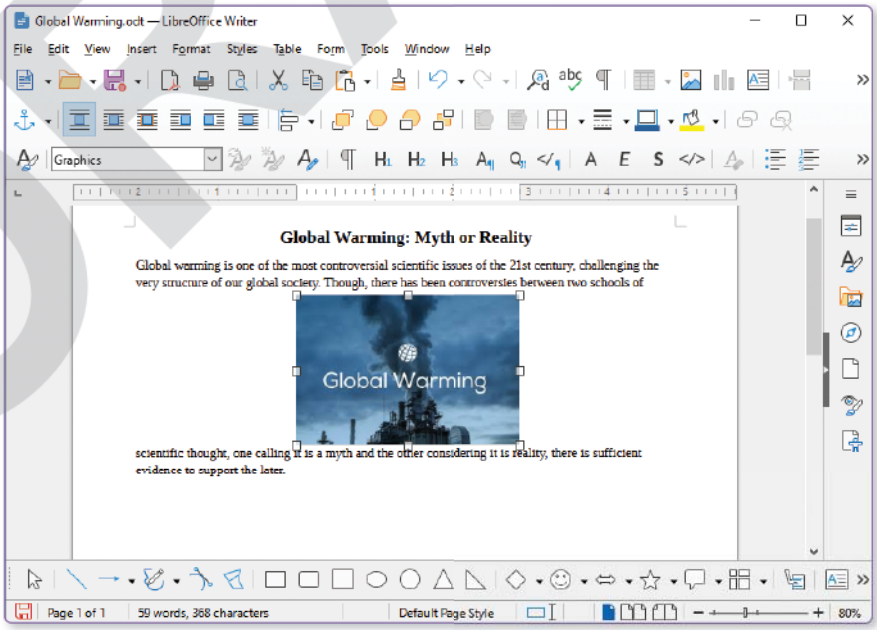
To change the anchoring options of an image, perform the following steps:

Step 1: Right-click on the image and select the **Anchor** option from the context menu.

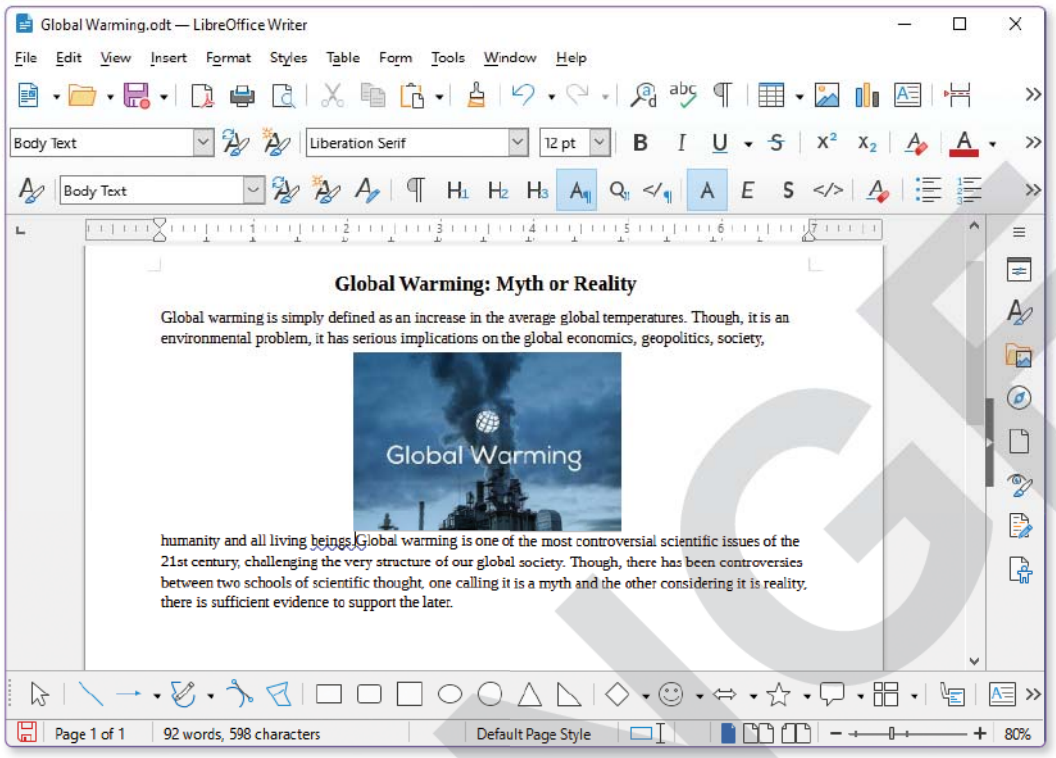
A sub-menu appears on the screen.

Step 2: Select the desired anchor option from the submenu.

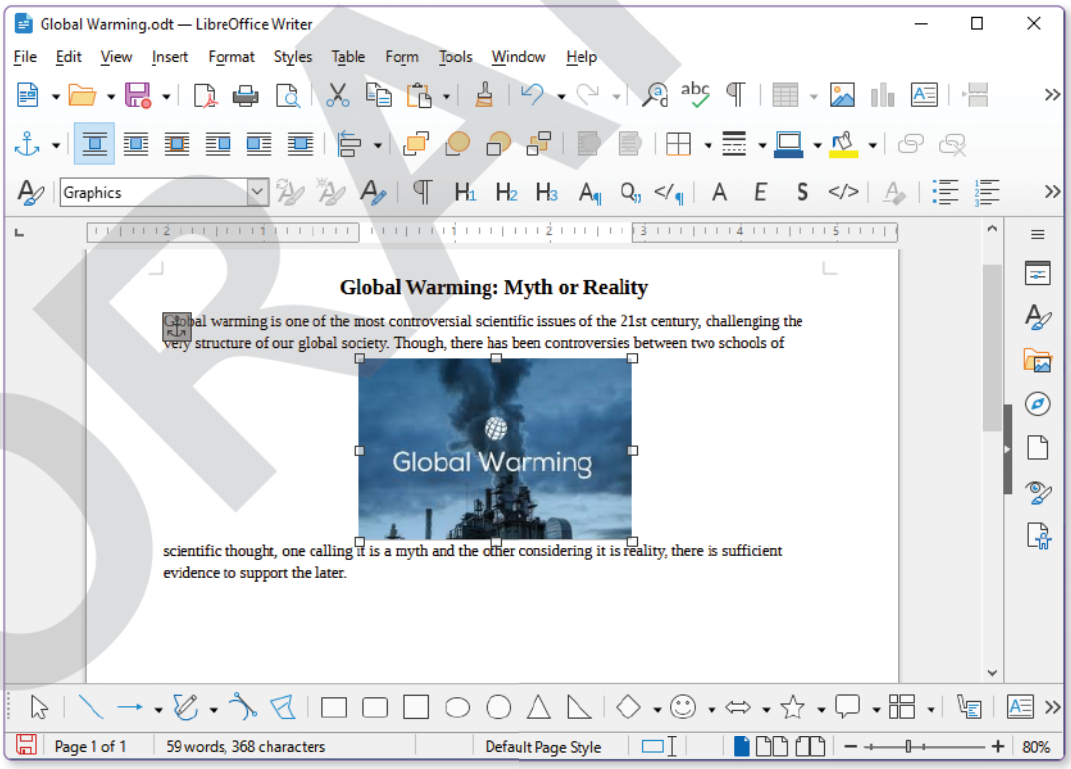
To Page: In the below figure, the image is anchored to page:



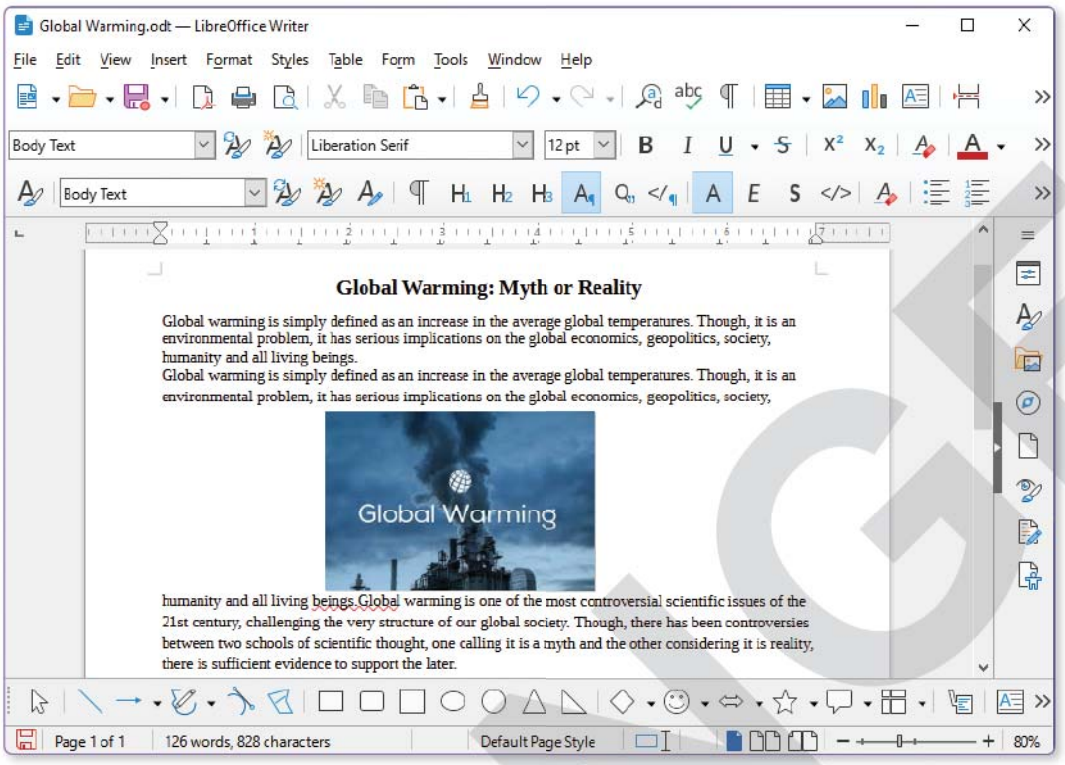
Now, when we add a new paragraph in the document. The position of image remains fixed in its position but the paragraph moves, as shown in below figure:



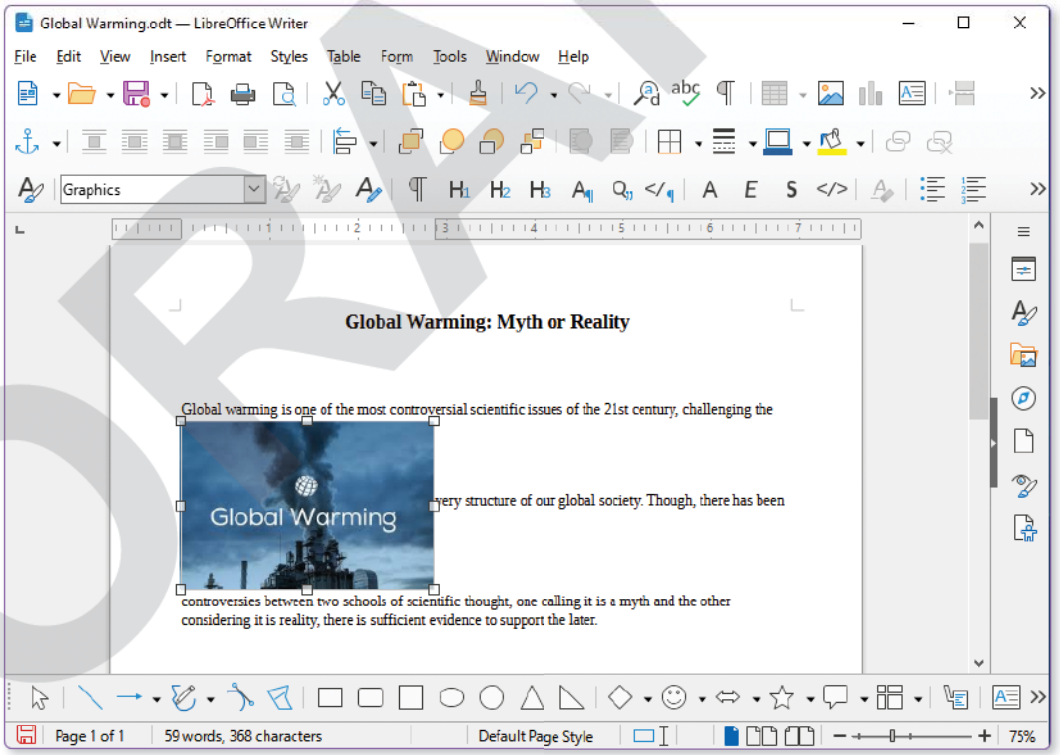
To Paragraph: In the below figure, the image is anchored to paragraph:



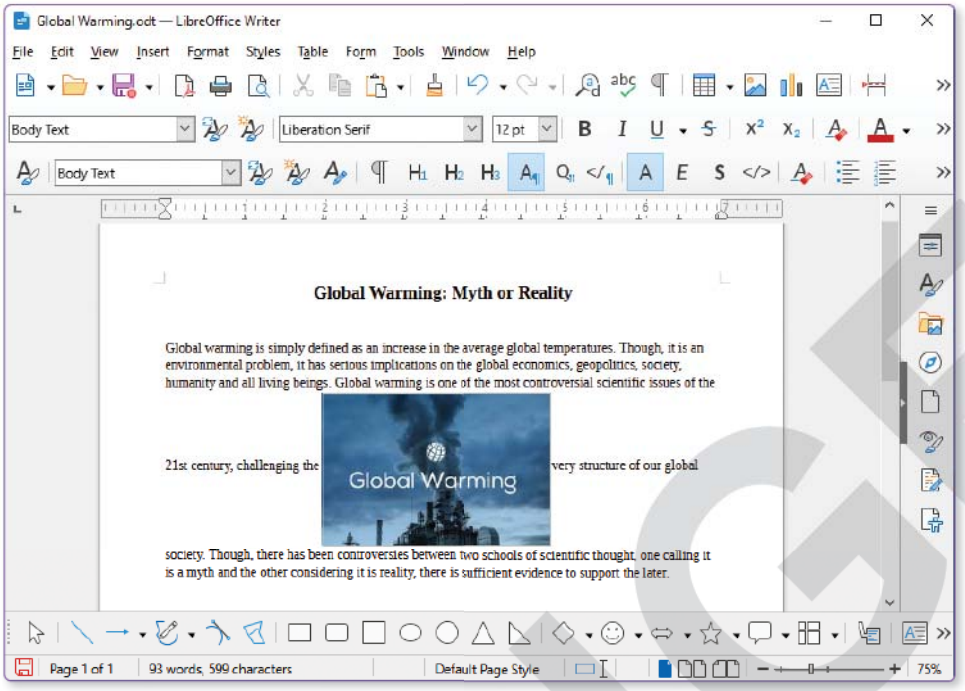
Now, when we add a new paragraph in the document. The image shifts downwards with paragraph, as shown in below figure:



As Character: In the below figure, the image is anchored as character:



Now, when we add a new paragraph in the document. The image with character, as shown in below figure:



Arrangement

Arrangement refers to the order in which objects or image appear relative to each other. Arrangement controls how graphics are stacked upon each other or relative to the text. In a document with multiple graphics or objects, the arrangement setting determines which objects are in front of or behind others.

The Drawing Object Properties toolbar consists of six arrangement tools as explained below:

- **Bring to Front:** This option moves the selected object to the front of all other objects, making it visible above everything else.
- **Forward One:** This brings the selected object one layer forward, making it more visible compared to objects behind it but still potentially obscured by objects in front of it.
- **Back One:** This sends the selected object one layer backward, making it less visible compared to objects in front of it but still potentially covering objects behind it.
- **Send to Back:** Conversely, this option sends the selected object to the back of all other objects, making it appear behind everything else.
- **To Foreground:** Moves the drawing object in front of the text.
- **To Background:** Moves the drawing object behind the text

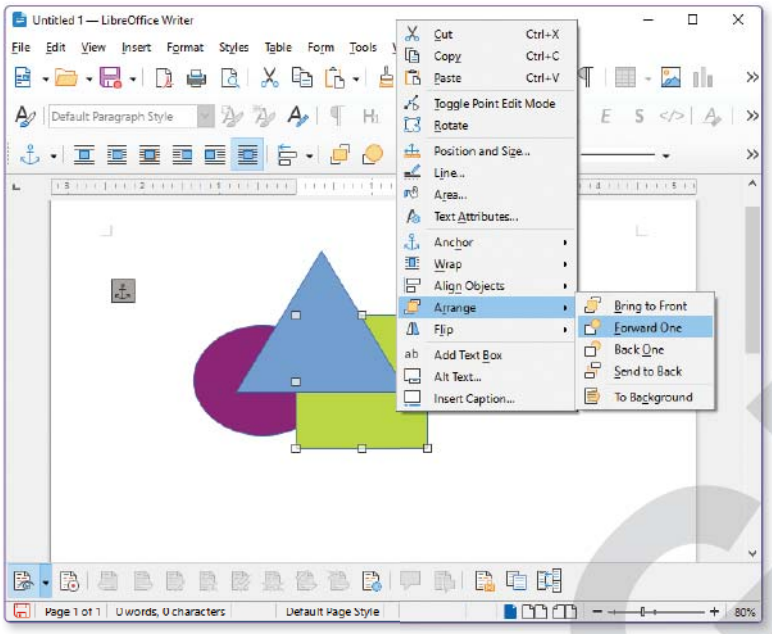
To arrange graphics in the document, perform the following steps:

Step 1: Open the document containing an image or object that overlap each other.

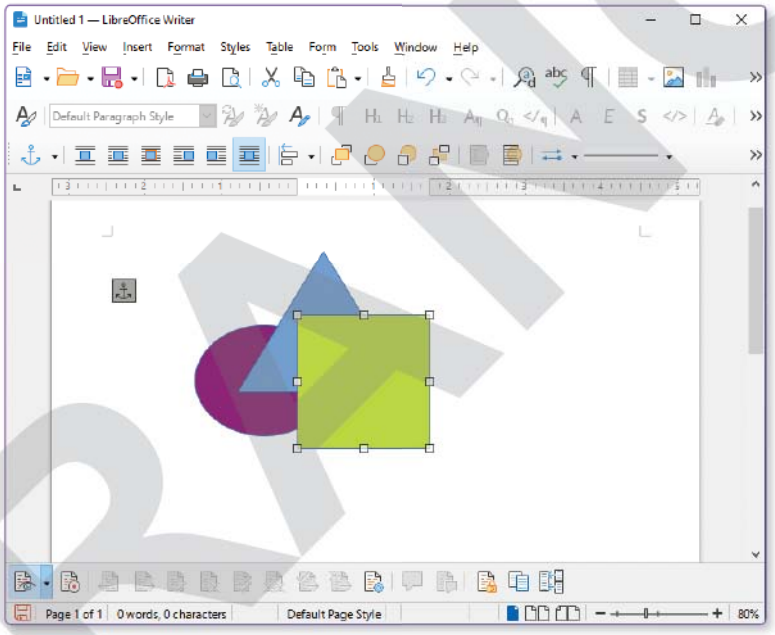
Step 2: Right-click on the image or object that you want to arrange and select the **Arrange** option from the context menu.

A sub-menu appears on the screen.

Step 3: Select the desired arrangement option from the submenu. In this case, we have selected **Forward One** option, as shown in below figure:

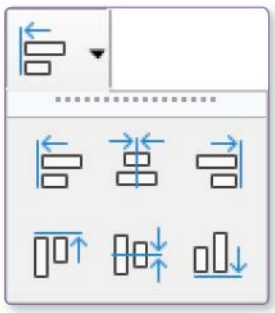


The selected object moves one layer forward in the stack, as shown in below figure:



Alignment

Alignment refers to the vertical or horizontal placement of a graphic in relation to the chosen anchor point. You can align objects horizontally, vertically, or both. This setting helps in creating a neat and organised layout by ensuring that graphics are positioned consistently. In LibreOffice Writer, you can align objects and images horizontally and vertically using various options:



- **Horizontal Alignment:** It contains three options, which are:
  - **Left Alignment:** Aligns objects or images to the left edge of the page or the nearest margin.
  - **Center Alignment:** Centers objects or images horizontally on the page.
  - **Right Alignment:** Aligns objects or images to the right edge of the page or the farthest margin.

- **Vertical Alignment:** It contains three options, which are:
  - **Top Alignment:** Aligns objects or images to the top edge of the page.
  - **Middle Alignment:** Centers objects or images vertically on the page.
  - **Bottom Alignment:** Aligns objects or images to the bottom edge of the page.

To align image or object, perform the following steps:

Step 1: Open the document containing an image or object.

Step 2: Right-click on the image or object that you want to arrange and select the **Align Objects** option from the context menu.

A sub-menu appears on the screen.

Step 3: Select the desired alignment option from the submenu.

The image or object aligned according to the specified alignment.

Text Wrapping

Text Wrapping allows the placement of image in relation to text. Text Wrapping tools are available under Drawing Object Properties toolbar. Text wrapping is essential for integrating graphics seamlessly into the text flow of a document.

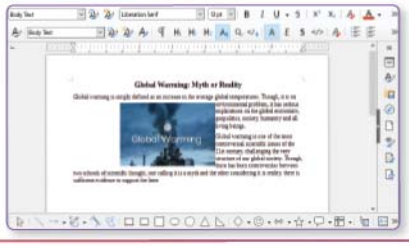
The steps to wrap text are as follows:

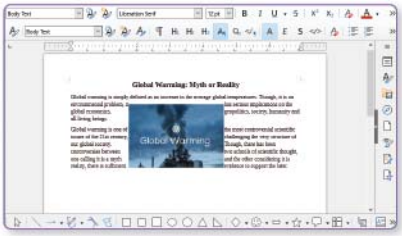
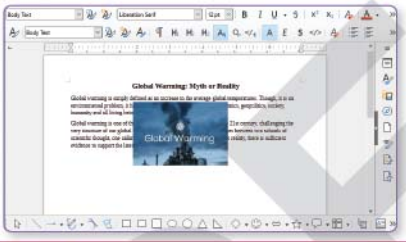
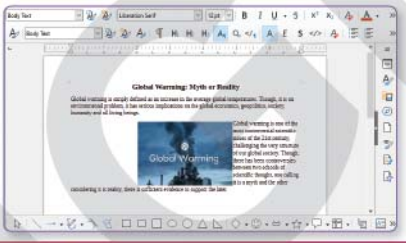
Step 1: Select the image in the document.

Step 2: Right-click on the image and then select the **Wrap** option from the context menu.

As submenu appears.

Step 3: Select the desired wrapping options from the submenu.

Option	Description	Example
None	The text is placed above and below the image.	
Before	The text is placed before the image or left side of the image.	
After	The text is placed after the image or right side of the image.	

Parallel	Text flows around the image. Moving an image will rearrange the text on the page.	
Through	The image comes above the text. In this case the image should have transparency so that the text below it is visible properly.	
Optimal	Optimal prevents text from being placed to the side of the image if the spacing between the image and the margin is less than 2 cm.	

Quiz Bee

Fill in the blanks.

1. _____ menu contains image related options.
2. _____ controls the flow of text around an image.
3. _____ removes the unwanted portion of an image.

CREATE AND USE TEMPLATE

A template is a predefined layout or a blueprint of a document with saved formatting features like font styles, logos, borders, colour pattern, text design, etc. Later a document is created using these pre-defined templates. The advantage of using these templates is that you do not have to waste time in designing a format of the document needed. Formats like training document, meeting agenda document, resume making layout, etc. are already available. You just select them at the time of making a new document and fill the content in the blueprint available.

A template can have:

- Printer settings like the type of a printer, paper type and printing single side or double side.
- Document styles like character, page, frame, lists, etc.
- Headers and footers containing name, logos, signature, greetings, etc.

If you wish to create a new document with a blank layout, then you start a new document with the default blank template.

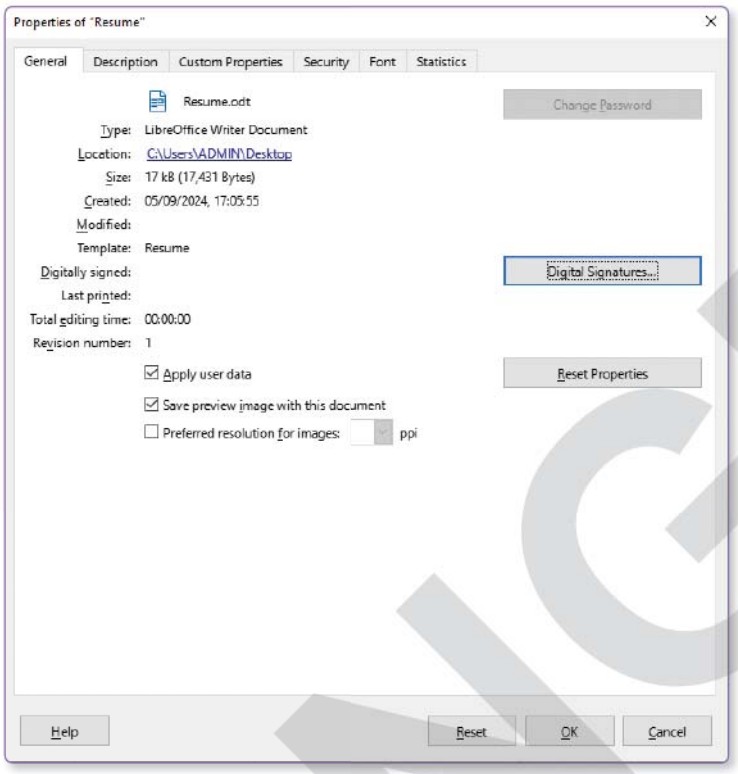
Checking the Template of the Document

To check the template associated with a document in LibreOffice Writer, you can follow these steps:

Step 1: Open the document for which you want to check the associated template in LibreOffice Writer.

Step 2: Click on the **File** menu and then select the **Properties** option.

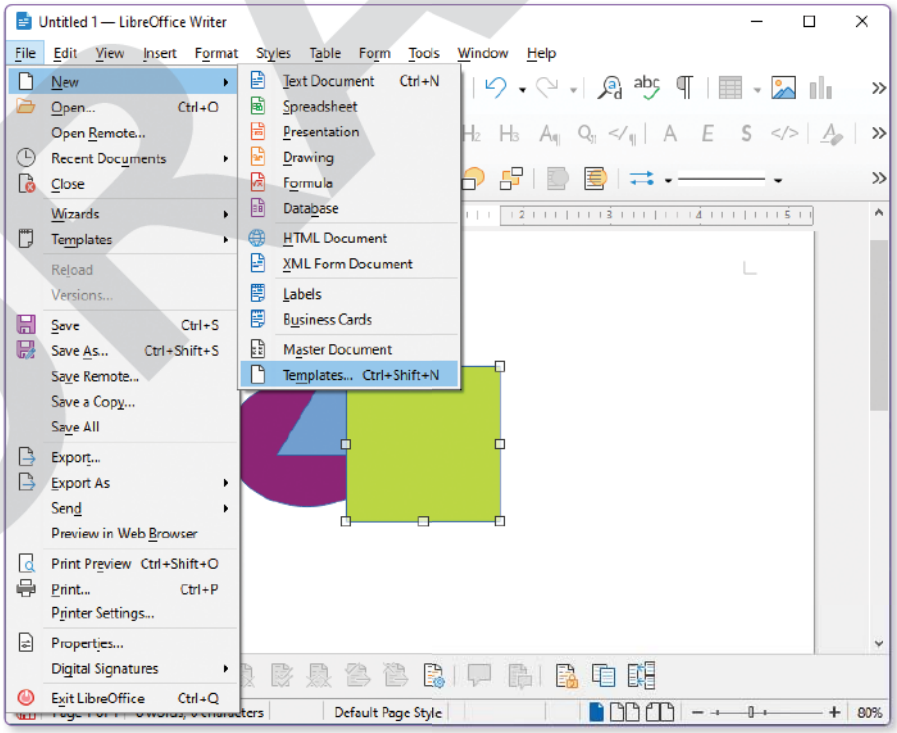
The **Properties** dialog box will open, displaying various information about the document along with the template information, as shown in below figure:



Using an Existing Template

At the time of creating a document if you wish to use a particular template then follow the given steps:

Step 1: Select the **File → New → Templates** option from the menu bar.



The **Templates** dialog box appears containing a list of available templates.

Step 2: Select the template category according to your requirement.

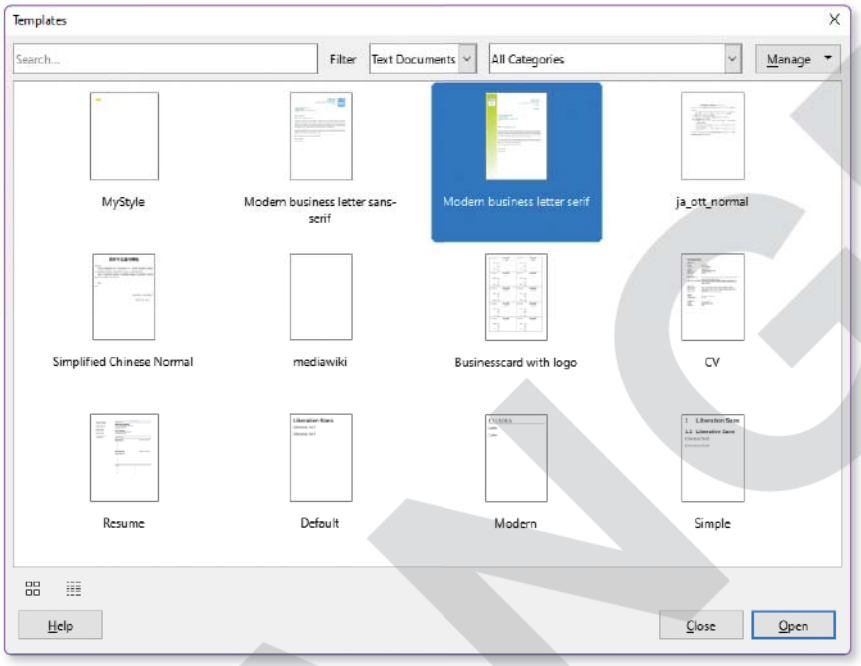
Step 3: Select the desired template. In this case, we have selected **Modern *Business Letter Serif***.

Step 4: Click on the **Open** button.

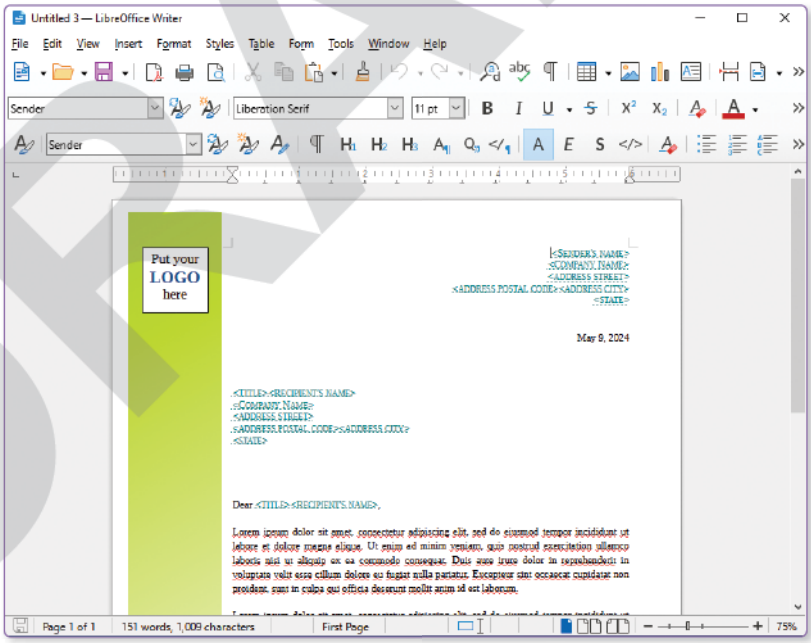
SHORT KEY

To open Templates dialog box:

Ctrl + Shift + N



The document opens with the selected template as shown in below figure:



Creating a Template

A template can be created by using any of the two available methods:

- Creating a template from a document
- Creating a template using a wizard

Creating a Template from a Document

The steps to create a template from a document are as follows:

Step 1: Create a new document or open an existing document.

Step 2: Add the content with the format, content and styles you want.

Step 3: Click on **File** → **Templates** → **Save as Template** option from the menu bar.

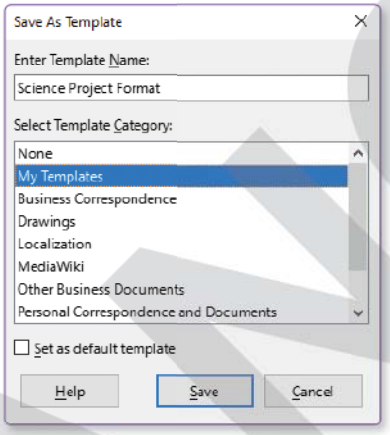
The **Save As Template** dialog box opens.

Step 4: Type the name of the template in the **Enter Template Name** text box.

Step 5: Select the desired category in which the template is saved.

Step 5: Select the **Set as *Default Template*** check box if you want to set this template as default template.

Step 6: Click on **Save** button to save the template.



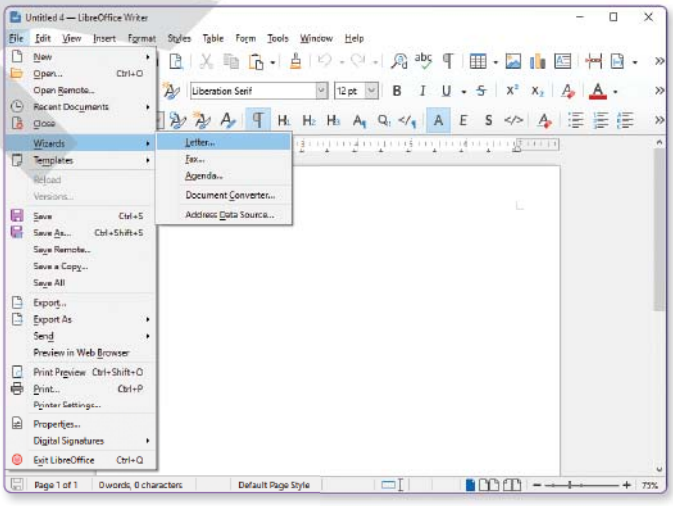
Creating a Template using a Wizard

Wizard is a process of doing work using a step by step dialog box. The steps to create a template using wizard are:

Step 1: Create a document according to your requirement and add the desired text and styles.

Step 2: Click on the **File** menu and then select the **Wizard** option. As submenu appears.

Step 3: Select the desired option based on which you want to create category.



Step 3: Different categories of template will have different sets of dialog boxes appearing. Follow the steps and then save the template.

Using Online Templates

LibreOffice offers a broad pool of online templates that you can access by download from the Internet. After downloading and installing these templates on your computer, they will be available in the Templates dialog box. Perform the following steps to install and use online templates:

Step 1: Click on the **File → Templates → Manage Templates** option from the menu bar of LibreOffice Writer.

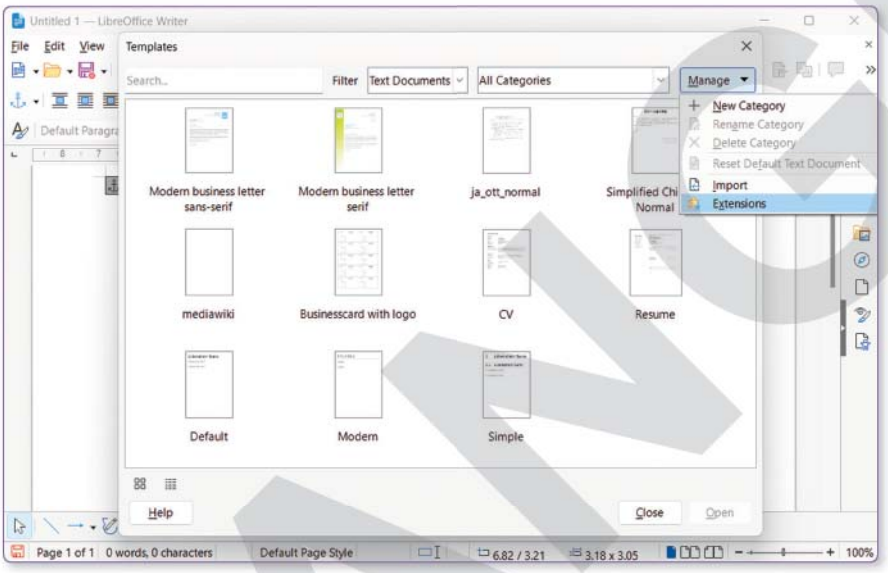
OR

Click on the **File → New → Templates** option from the menu bar.

The **Templates** dialog box appears.

Step 2: Click on the **Manage** button.

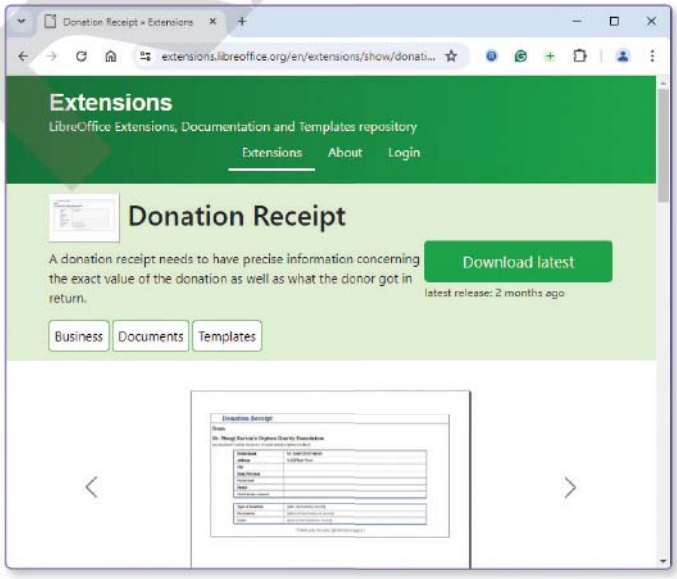
Step 3: Select the **Extension** option.



The Extensions: Templates dialog box opens with a set of templates.

Step 4: Choose the desired template and click on the **Website** link. A web page opens in your web browser with the desired template.

Step 5: Click on the **Download latest** button.



Step 6: Open the LibreOffice Writer document.

Step 7: Click on the **File → Open** option from the menu bar.

The **Open** dialog box opens.

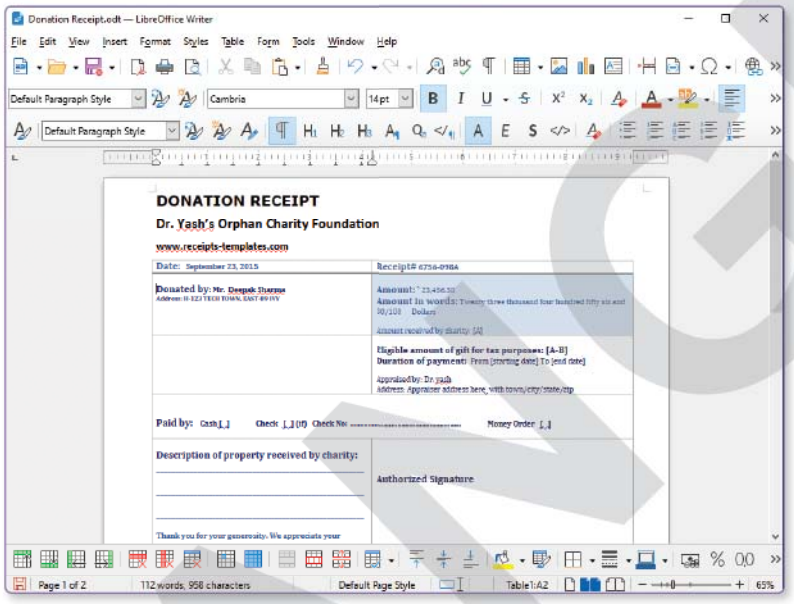
Step 8: Navigate the location and select the downloaded template.

Step 9: Click on **Open** button.

The template file Donation Receipt.ott will open.

Step 10: Edit the document according to your requirement.

Step 11: Save the file as text file **Donation Receipt.odt**, as shown below:



Setting a Custom Template as a Default Template

A default template is automatically used when creating a new document. This default template can be changed by making any other template made by the user as a default template by following the given steps:

Step 1: Click on **File → Templates → Manage Templates** option from the menu bar.

OR

Click on **File → New → Templates** option from the menu bar.

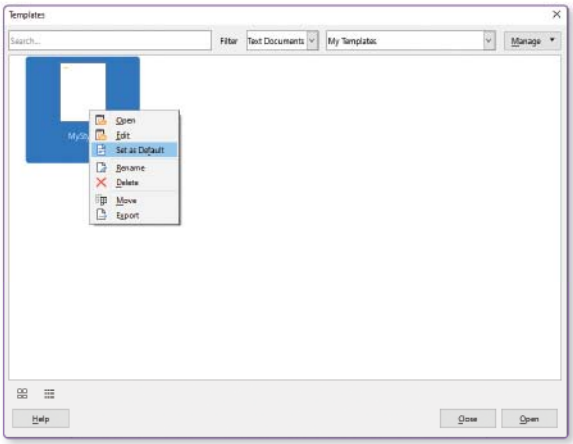
The **Templates** dialog box opens.

Step 2: Select the folder containing the saved template you wish to use. In this case, we have selected **My Template**.

Step 3: Right-click the template that you want to set as default.

Step 4: Select the **Set as Default** option from the content menu.

Step 5: Click on **Close** button in the **Templates** dialog box.



Now, the **MyStyle** template is set as a default template. Next time whenever you create a new document by using **File → New** option, this custom template will be the default template.

Importing a Template

After downloading and saving a template into any file or folder, you can import it to make it appear in the list of templates within the Templates dialog box.

To import the template, perform the following steps:

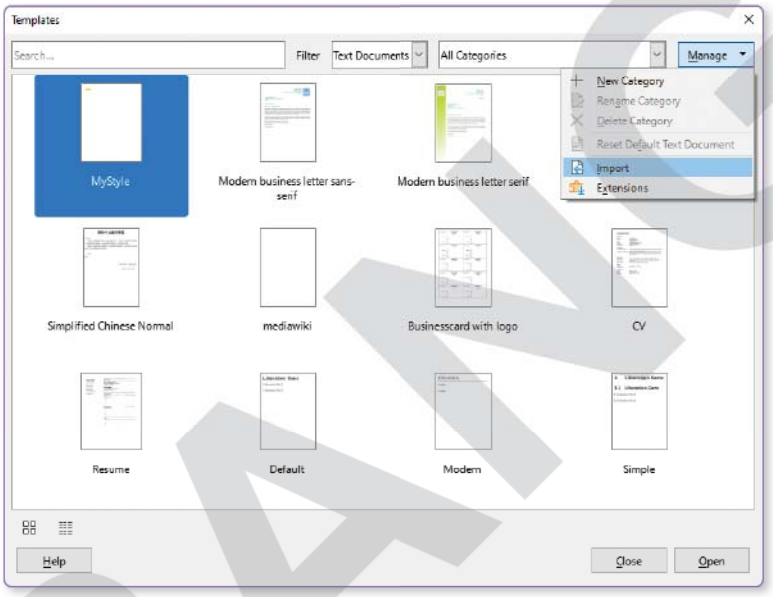
Step 1: Click on **File → Templates → Manage Templates** option from the menu bar.

OR

Click on **File → New → Templates** option from the menu bar.

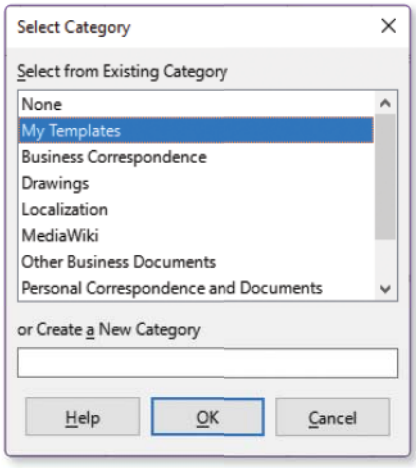
The **Templates** dialog box opens.

Step 2: Click **Manage** button in the dialog box and select the **Import** option from the drop-down list, as shown in below figure:

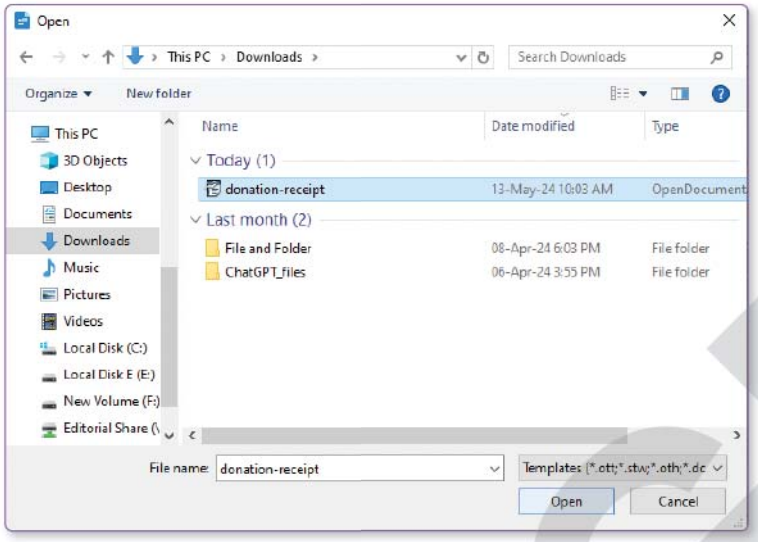


The **Select Category** dialog box will open.

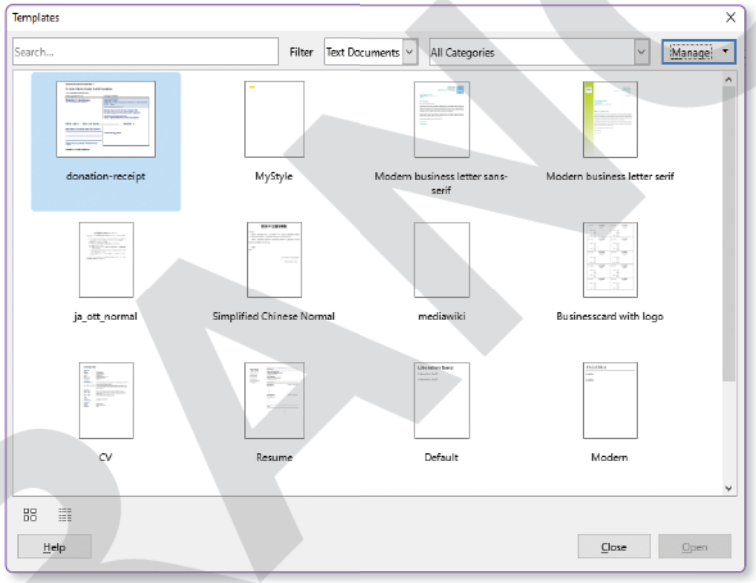
Step 3: Select the category from the **Select from Existing Category** list box in which you add the new template into any existing category. Otherwise, type the name of the new category in the **Create a New Category** text box, as shown in below figure:



Step 4: Click on **OK** button.



The selected file will be added to the list of templates as shown in below figure:



Changing to a Different Template

To change to a different template, follow the steps given below:

Step 1: Choose **File** → **New** → **Template**. The **Templates** dialog box opens.

Step 2: Select the template you want to open.

Step 3: Click on the **Open** button to open it.

OR

Double-click on the template to open it.

Now you can use the template according to your requirement.

Editing a Template

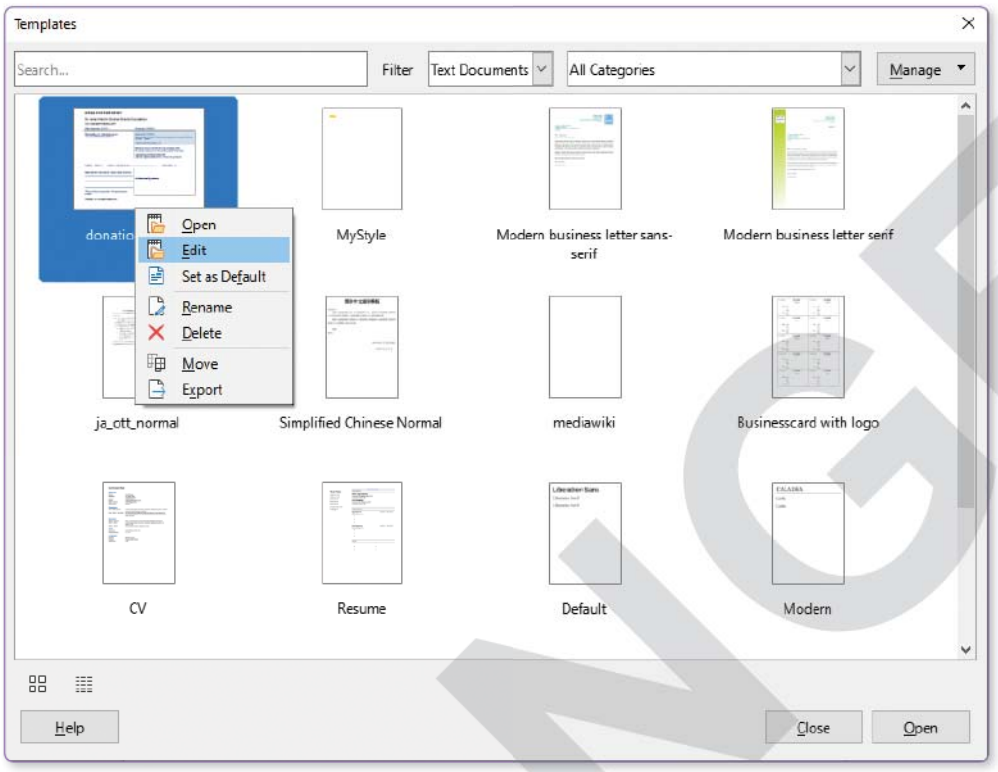
After creating a template, you can make desired changes in it according to your requirement. To do so, perform the following steps:

Step 1: Click on the **File** → **Templates** → **Manage Templates** option from the menu bar.

The **Templates** dialog box will be displayed.

Step 2: Right-click on the template that you want to edit.

Step 3: Select the **Edit** option from the context menu.



The template file will be opened.

Step 4: Make the desired changes and save the file.

Once this template is applied to any document, the edited file will be utilised.

You can also edit the template, by performing the following steps:

Step 1: Click on the **File** → **Templates** → **Edit Template** option from the menu bar.

The **Open** dialog box opens.

Step 2: Navigate the location and select the desired file that you want to edit.

Step 3: Click the **Open** button.

The template file will be opened.

Step 4: Make the desired changes and save the file.

Once this template is applied to any document, the edited file will be utilised.

Setting up a Custom Template as Default Template

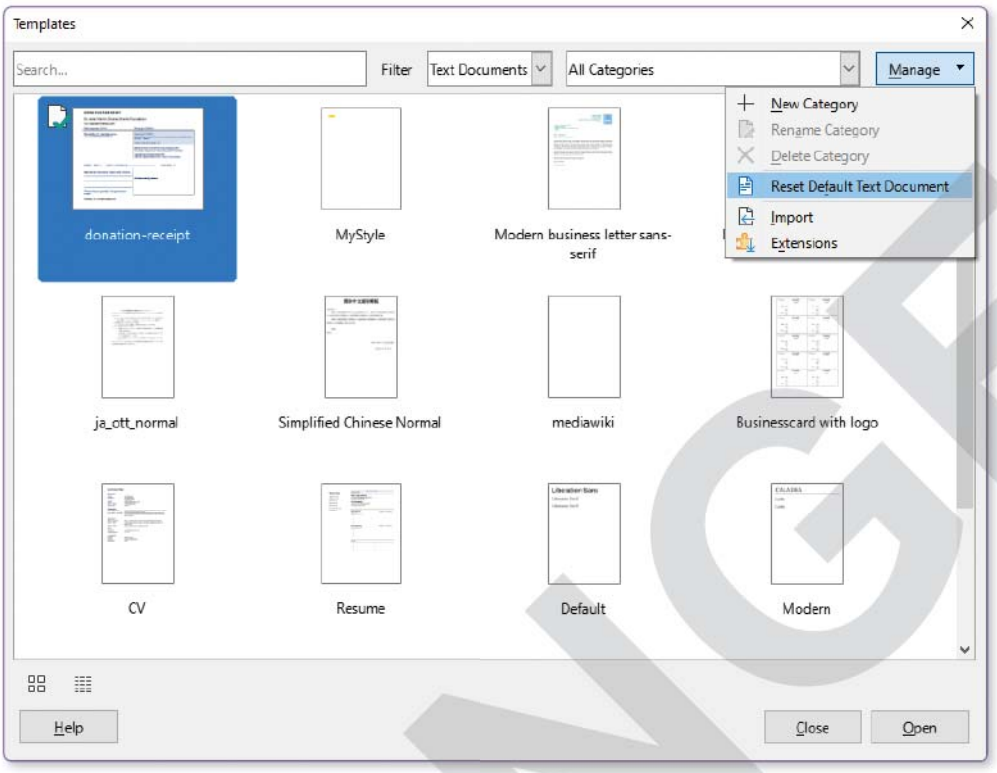
Any document can be set as a default template by following the given steps:

Step 1: Click on the **File** → **Templates** → **Manage Templates** option from the menu bar. This will open the **Templates** dialog box.

Step 2: Right-click the template that you want to reset to default template and select the Reset default option from the context menu.

OR

Click the **Manage** button in the dialog box and select the **Reset Default Text Document** option from the drop-down list, as shown in below figure:



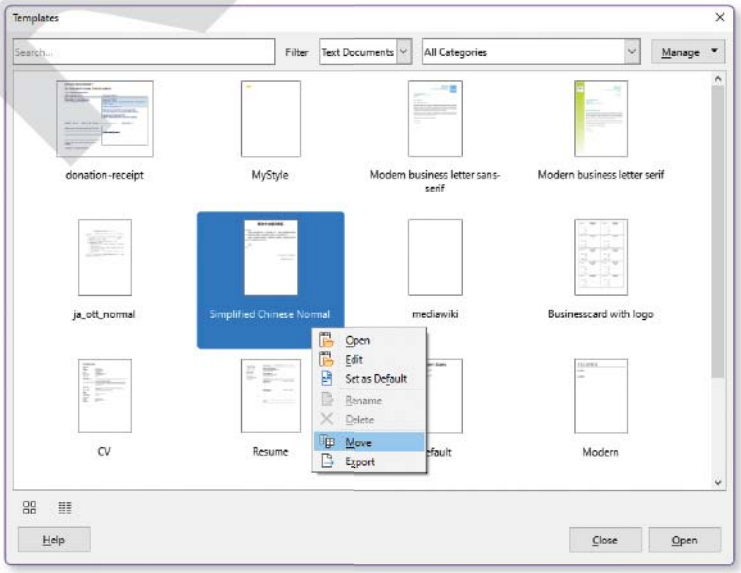
Whenever next time you create a new document using the **File → New** option from the menu bar, then the document will be using the LibreOffice default template.

Moving a Template

When you hover the mouse pointer over any of the templates in the Templates dialog box, a tooltip will appear showing the name of the template and its corresponding category. In LibreOffice Writer, you can move a template from one category to another. To do so, perform the following steps:

Step 1: Click on the **File → Templates → Manage Templates** from the menu bar. The **Templates** dialog box opens.

Step 2: Right-click the template that that you want to move and select the **Move** option from the context menu.



The **Select Category** dialog box opens.

Step 3: Select the category from the **Select from Existing Category** list box in which you add the new template into any existing category. Otherwise, type the name of the new category in the **Create a New Category** text box.

Step 4: Click the **OK** button.

The template is moved from one category to another.

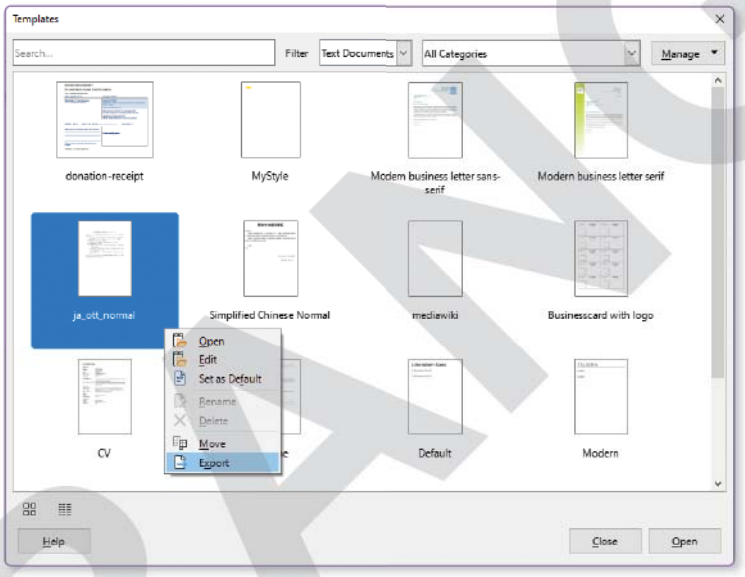
Exporting a Template

Exporting templates in LibreOffice Writer lets users create a consistent format for their documents, which they can share with others. This ensures uniformity across documents, saves time, and maintains branding or style guidelines within an organisation. It also allows users to share their designs more widely, encouraging collaboration and making document creation more efficient.

To export a template, perform the following steps:

Step 1: Click on the **File → Templates → Manage Templates** from the menu bar. The **Templates** dialog box opens.

Step 2: Right-click the template that you want to export and select the **Export** option from the context menu.



The **Select Folder** dialog box opens.

Step 3: Navigate the location by selecting the folder where you want to export the desired template.

Step 4: Click on the **Select Folder** button.

The template is exported to the specified location.

Applying Templates to a Blank Document

You can apply the template from the available template list to any blank document. To do so, perform the following steps:

Step 1: Click on the **File → New → Text Document** from the menu bar. A blank document is opened.

Step 2: Click on the **File → Templates → Manage Templates** from the menu bar. The **Templates** dialog box opens.

Step 3: Select the template that you want to open and select the **Open** button.

The template will be opened in a new window.

Step 4: Select the entire content of the template by pressing the **Ctrl+A** shortcut key and pressing the **Ctrl+C** shortcut key to copy the selected content.

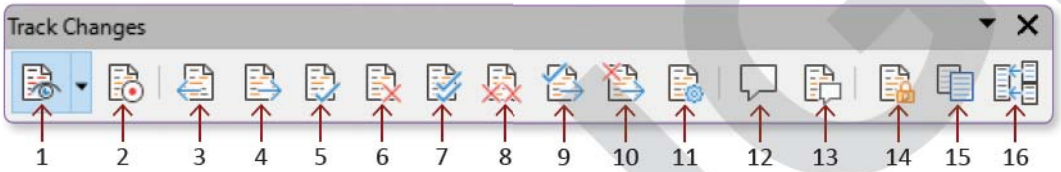
Step 5: Open the blank document and paste the copied content of the template by pressing the **Ctrl+V** shortcut key.

Step 6: Modify the template according to your requirement and save it as a text file.

TRACK CHANGES FEATURE

Track Changes is a feature that facilitates the process of commenting, modifying, and reviewing a document among multiple users. A document prepared by one user must be reviewed and modified by themselves or other users. If any changes are made to the source document directly, the originality of the file may be discarded. Instead, the Track Changes feature in Writer provides a different approach for keeping track of all changes made to the source document. The author who initially prepare the document can approve or reject all of the recorded changes. Additionally, the Track Changes features allows us to enter comments while examining a document.

The Track Changes toolbar contains various tools that help to track the changes made by different users. You can view the **Track Changes** toolbar by selecting the **View → Toolbars → Track Changes** option from the menu bar. The **Track Changes** toolbar will appear in the bottom left corner of the Writer window, as shown in below figure:



The various buttons present on the Track Changes toolbar are as follows:

1. **Show Track Changes:** Displays modifications made in the document by various users.
2. **Record Track Changes:** Activates the Track Changes feature. After activating this feature, any modification will be marked in the document.
3. **Previous Track Changes:** Moves to the previous tracked change in the document.
4. **Next Track Changes:** Moves to the next tracked change in the document.
5. **Accept Track Change:** Allows you to accept the selected tracked change, incorporating it into the document.
6. **Reject Track Change:** Allows you to reject the selected tracked change, removing it from the document.
7. **Accept All Tracked Change:** Accepts all tracked changes currently displayed in the document according to the selected filter criteria.
8. **Reject All Tracked Change:** Rejects all tracked changes currently displayed in the document according to the selected filter criteria.
9. **Accept Track Change and select the next one:** Accepts the currently selected tracked change and automatically moves to the next change in the document.
10. **Reject Track Change and select the next one:** Rejects the currently selected tracked change and automatically moves to the next change in the document.
11. **Manage Track Changes:** Opens a Manage Changes dialog box where you can manage tracked changes, including accepting or rejecting multiple changes at once, viewing a list of changes, and adjusting settings related to tracking changes.
12. **Insert Comment:** Allows you to add comment in a document.
13. **Insert Track Change Comment:** Allows you to provide feedback or clarification on a specific change made to the document.
14. **Protect Track Changes:** Locks the document to prevent further changes from being made while still allowing tracked changes to be accepted or rejected.
15. **Compare Non-Track Changed Document:** Allows you to compare non-track changed documents, visually inspect content side by side

16. **Merge Track Changed Document:** Allows you to merge track-changed documents, review and accept/reject changes, resolve conflicts, then save the merged document.

Preparing a Document for Review

The Track Changes feature is utilised when a document is distributed among one or more people for review or editing. So, before distributing the document, ensure that any changes made are recorded. This ensures that, once the review is completed, the original author of the document has an option to accept or reject the changes made. Author can ensure that no user can stop the track changes feature by protecting the document using password.

To do this, perform the following steps:

Step 1: Create a new document in LibreOffice Writer.

Step 2: Select the **Edit → Track Changes → Protect** option from the menu bar.

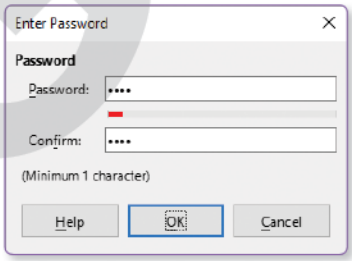
OR

Click the **Protect Track Changes** button in the **Track Changes** toolbar.

The **Enter Password** dialog box will appear.

Step 3: Enter the same password in **Password** and **Confirm** text box.

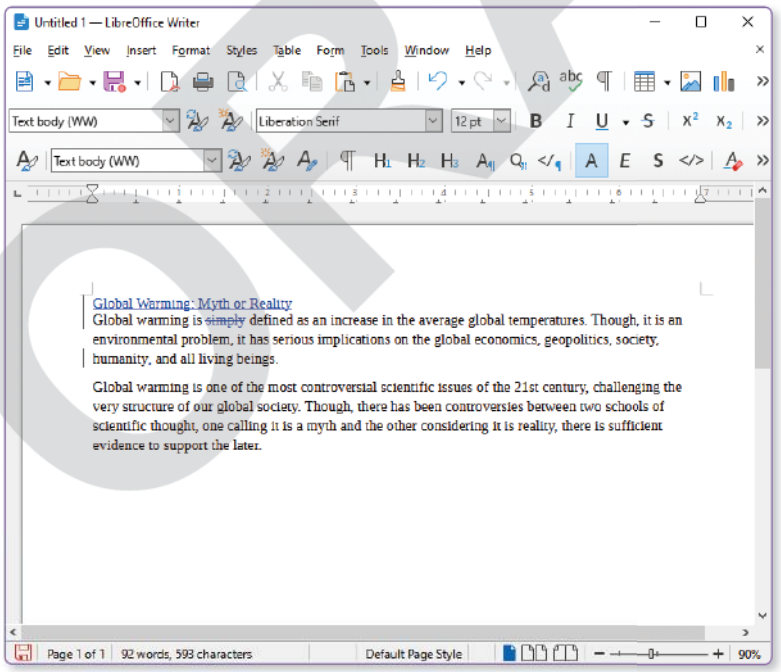
Step 4: Click on the **OK** button.



After the document has been protected with a password, any attempt by a user to disable the Track Changes feature will prompt Writer to request the password.

Recording Changes

Once Track Changes is activated, reviewers can commence recording changes in the document. To do so, select the **Edit → Track Changes → Record** option from the menu bar, or you can also select the **Record Track Changes** button from the **Track Changes** toolbar. Upon selecting the Record option, Track Changes becomes active. Now, the modification done by the user is recorded in the document. Any deleted content will appear as strikethrough text, while any added content will be displayed in a different colour, as shown in below figure.

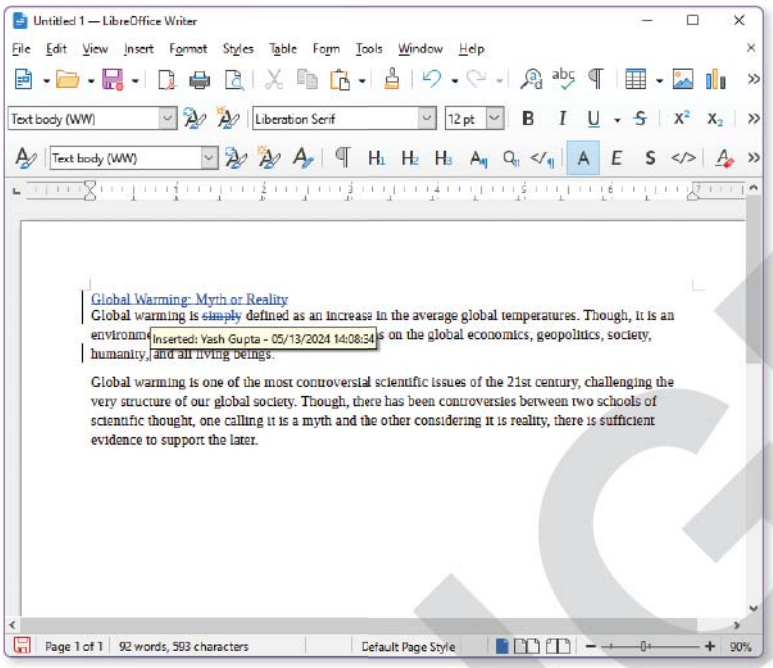


SHORT KEY

To start recording the changes is:

Ctrl + Shift + C

When you hover your cursor over any of the changes, a tool tip appears that provides an information about the author, the modification made, the date and time of the change done as shown in below figure.



To stop recording, disable the record changes by selecting the **Edit → Track Changes → Record** option.

Accepting and Rejecting Changes

Once the changes are made by all the reviewers, the original author may accept or reject them. To do this, follow the steps given below.

Step 1: Open the reviewed document.

Step 2: Click on the change made and then select **Accept Track Change** or **Reject Track Change** button, respectively in the **Track Changes** toolbar to accept or reject a change.

OR

Click on the change made and then select the **Edit → Track Changes → Accept** or **Reject** option, respectively in the menu bar to accept or reject a change.

Step 3: Click the **Accept All Tracked Changes** or **Reject All Tracked Changes** button, respectively in the **Track Changes** toolbar to accept or reject all the changes made in the document.

OR

Select the **Edit → Track Changes → Accept All** or **Reject All** option, respectively in the menu bar to accept or reject all the changes made in the document.

You can also accept or reject changes by using the Manage Changes dialog box. To do this, perform the following steps:

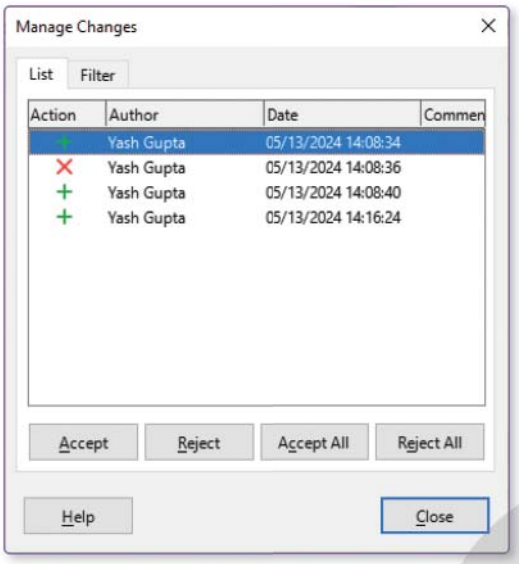
Step 1: Open the reviewed document.

Step 2: Click on the Manage Track Changes button in the **Track Changes** toolbar.

OR

Select the **Edit → Track Changes → Manage** option in the menu bar.

The **Manage Changes** dialog box opens. It contains the details of all the changes made in the document.



Step 3: Click on the **Accept** or **Reject** button to accept or reject the changes made, respectively.

Step 4: Click on the **Accept All** or **Reject All** button to accept or reject all the changes made, respectively.

Adding Comments

The Track Changes feature can also be used to add comments during reviewing or editing. For this, click where you want the comment to appear in the document.

Then, follow the steps given below to add comments in a document:

Step 1: Select the **Insert → Comments** option from the menu bar to insert comment in the document.

OR

Click the **Insert Comments** button in the **Track Changes** toolbar.

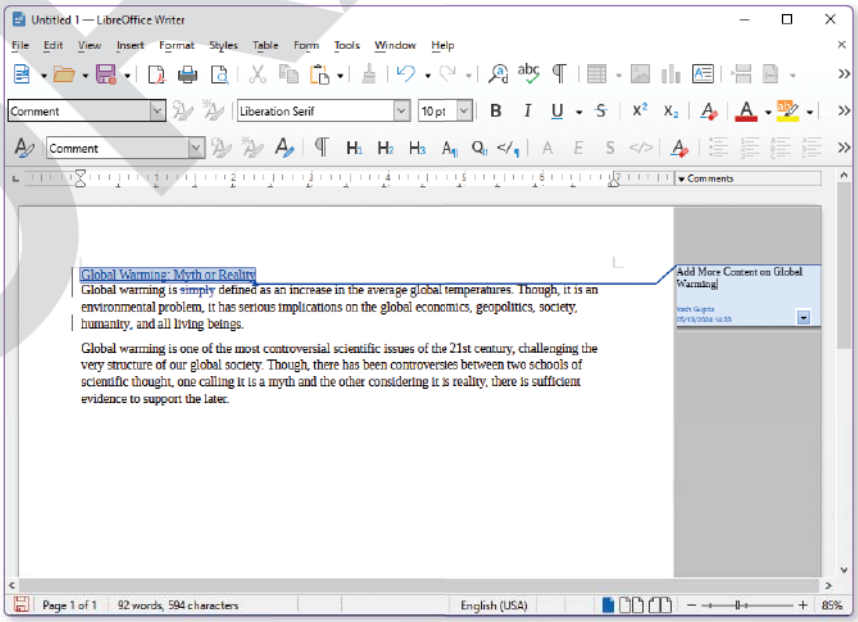
A comment box will be inserted on the right side of the window. It will have the name of the author or reviewer and date and time of the comment being made.

SHORT KEY

To insert comment in the document:

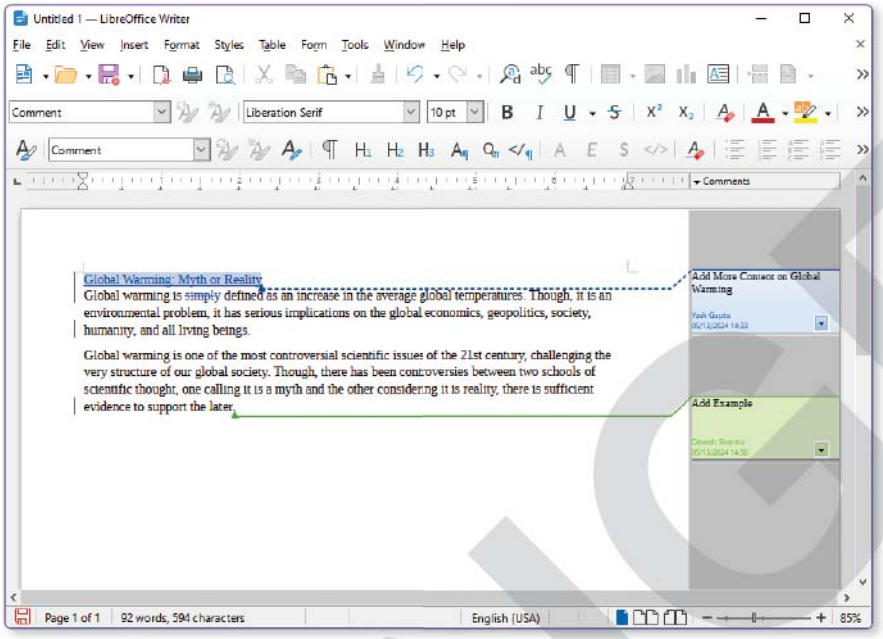
Ctrl + Alt + C

Step 2: Type the comment, as shown in below figure:



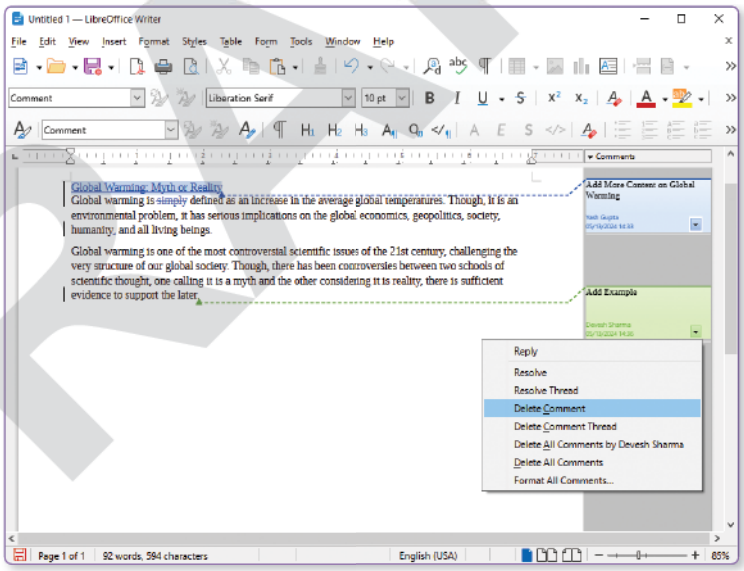
Step 3: Once done click anywhere on the document to deactivate it.

If more than one or two users add comments, the comments from each person will be displayed in various coloured comment boxes:



Deleting Comments

To delete a comment, simply click the down arrow located at the bottom right corner of the comment box. This action will prompt a popup menu to appear, as displayed in the below figure:



From there, you can choose to delete the current comment, all comments by a specific author, or delete all comments entirely. Simply select your desired option for deletion of comment.

Comparing Documents

After reviewers have made changes and provided comments, LibreOffice Writer enables you to compare the original document with the reviewed version. You can then select the option(s) that best suit your needs.

To compare the document, perform the following steps:

Step 1: Open the reviewed document.

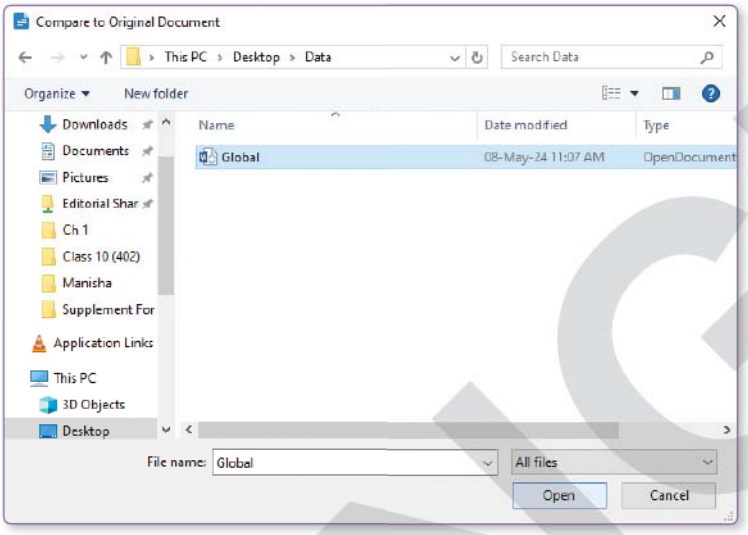
Step 2: Select the **Edit → Track Changes → Compare Documents** option from the menu bar.

OR

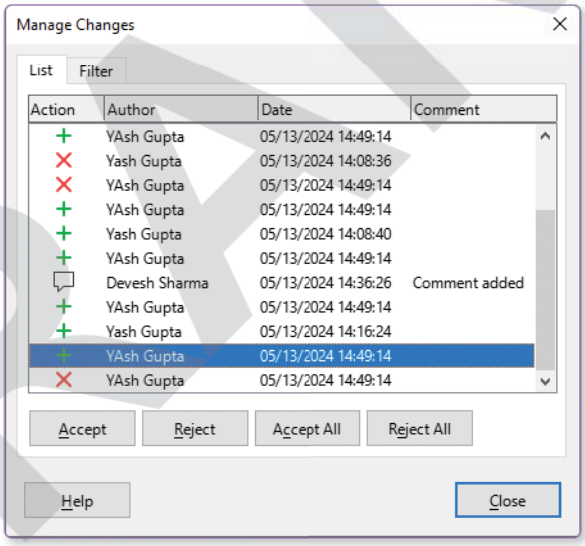
Click the **Compare Non-Track Changed Document** button in the **Track Changes** toolbar.

The **Compare to Original Document** dialog box opens.

Step 3: Browse and select the original file to be compared as shown in below figure:



The **Manage Changes** dialog box is displayed as shown in below figure:



Step 4: Accept or reject the desired changes by clicking the respective buttons.

Step 5: Click the **Close** button to close the dialog box when done.

Step 6: Save the edited file.

CREATE AND CUSTOMISE TABLE OF CONTENTS

Table of content is a list of topics and subtopics that have been covered in the document along with page numbers. The entries or contents of this table are hyperlinked and automatically taken from the headings and sub headings of the document. So by clicking on any topic in the table of contents, we can navigate directly to the selected topic.

You need to be sure before you use this feature that the headings of the documents are at the same level of indentation and are using the same styles.

Defining the Hierarchy of Headings

Heading Numbering defines the hierarchy of headings in a document. LibreOffice Writer supports up to 10 levels of headings H1 to H10. These headings are applied to the headings of the document. Some chapter titles and heading styles provide number to each chapter and heading level, for example, 1, 1.1, 1.2, 2, 2.1, and so on.

Heading Numbering

To apply heading styles to the headings in your document so that they appear in the Table of Contents in LibreOffice Writer, follow these steps:

Step 1: Select the **Tools → Heading Numbering** option from the menu bar. The **Heading Numbering** dialog box appears.

Step 2: Click on the **Numbering** tab.

Step 3: Select 1 for heading 1 in the **Level** list box.

Step 4: Select the numbering style that you want to apply to the selected heading level in the **Number** box.

Step 5: Enter the number at which you want to start the heading numbering for the selected level in the **Start at** box.

Step 6: Select the desired paragraph heading style in the **Paragraph style** box.

Step 7: Select the desired character style in the **Character style** box.

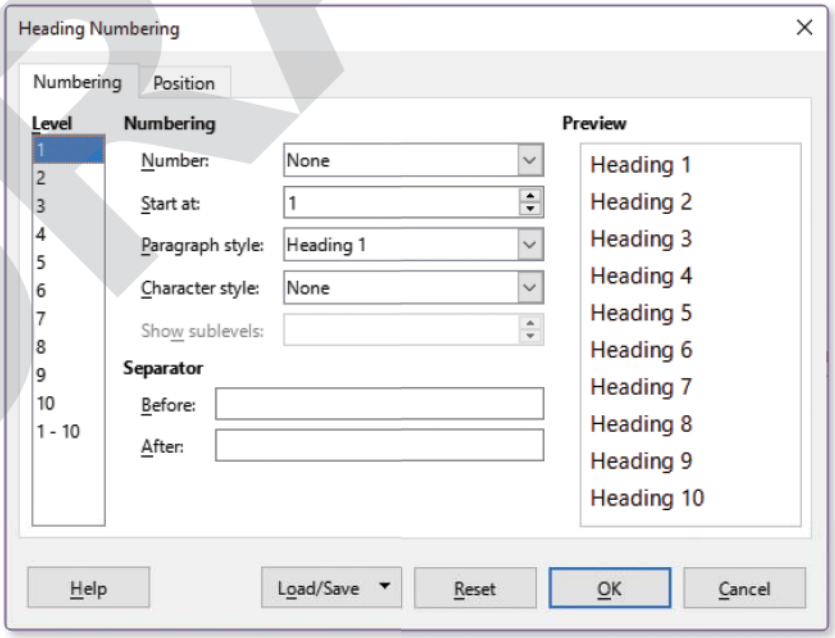
Step 8: Select the number of heading levels to include in the heading numbering in the **Show sublevels** box.

Step 9: Enter the text that you want to display before the heading number in the **Before** text box.

Step 10: Enter the text that you want to display after the heading number in the **After** text box.

Step 11: Repeat step 3 to 10 for specifying heading level to other headings.

Step 12: Click the **OK** button, as shown in below figure:



Heading numbering appears for all the headings.

To remove the automatic heading numbering from a heading:

Step 1: Select the **Tools → Heading Numbering** option from the menu bar. The **Heading Numbering** dialog box appears.

Step 2: Click on the **Numbering** tab.

Step 3: Select 1 for heading 1 in the **Level** list box.

Step 4: Select **None** in the **Number** box.

Step 5: Enter **0** in the **Start at** box.

Step 6: Select **None** in the **Paragraph style** box.

Step 7: Select **None** in the **Character style** box.

Step 8: Repeat step 3 to 7 for specifying heading level to other headings.

Step 9: Click the **OK** button.

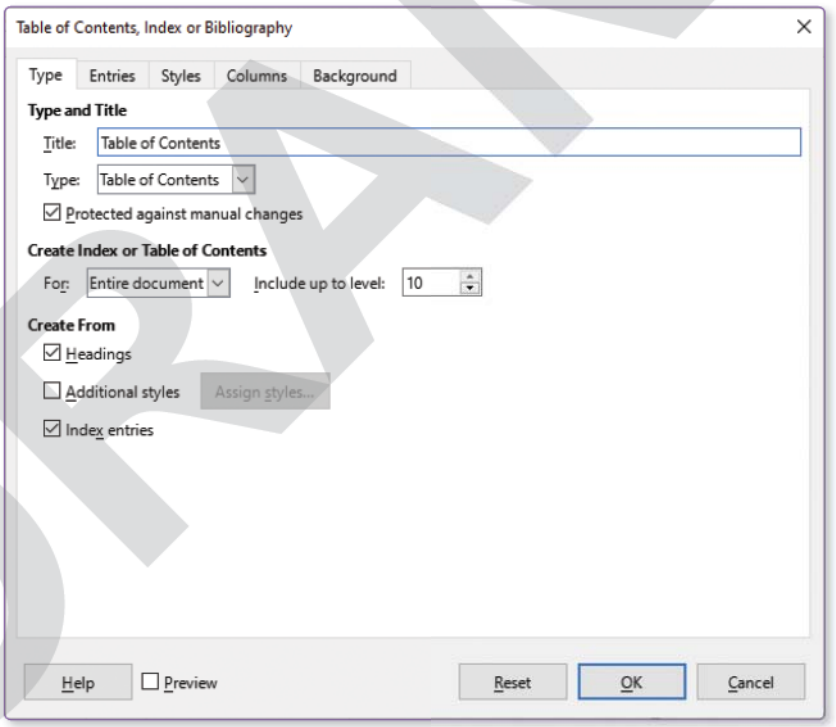
Creating a Table of Contents

To create a new table of contents, follow the steps given below:

Step 1: Move to the place in a document where you wish to insert a table of contents.

Step 2: Select the **Insert → Table of Contents and Index → Table of Contents, Index or Bibliography** option from the menu bar.

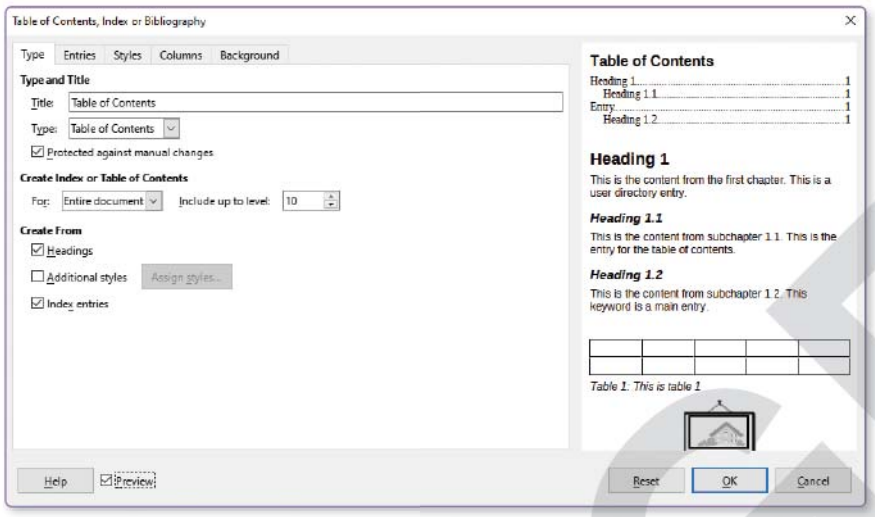
The **Table of Contents, Index and Bibliography** dialog box opens, as shown in below figure:



There are five tabs in this dialog box:

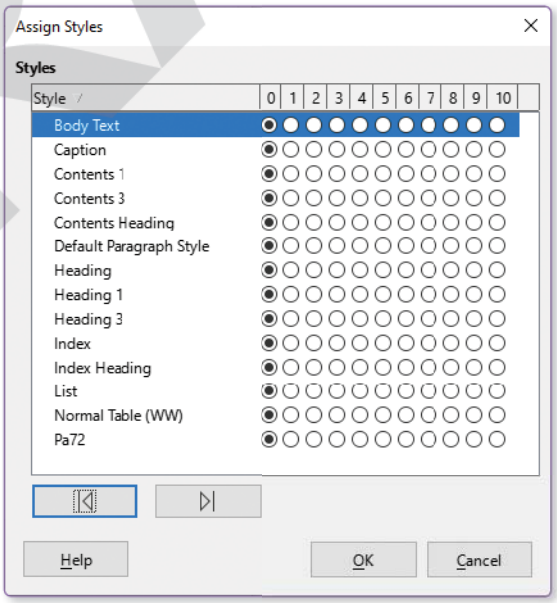
- **Type:** This sets the title and type of the TOC.
- **Entries:** This sets the table of contents entries.
- **Styles:** This format the entries in the table of contents.
- **Columns:** This puts the table of contents in two or more columns if needed.
- **Background:** This gives background colour to the table of contents.

When you select the **Preview** check box, the Preview Pane appears at the right of the dialog box, which displays the preview of the table of contents, as shown in below figure:



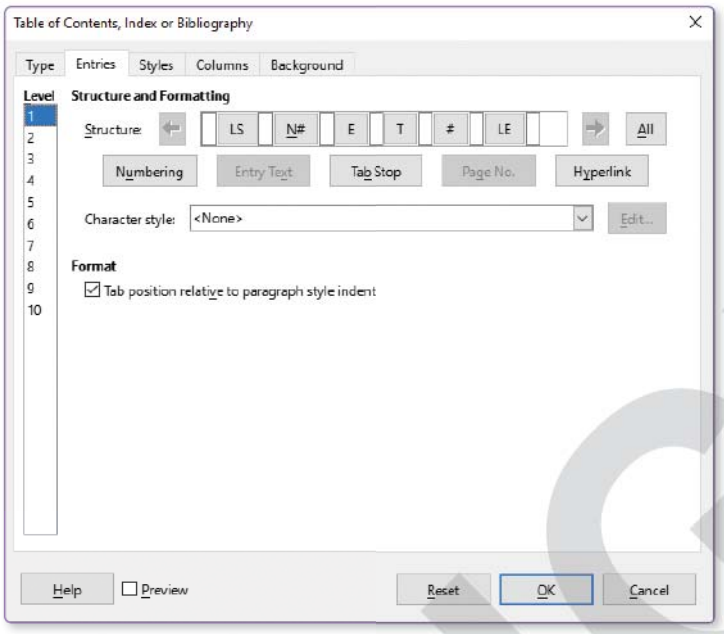
Step 3: The **Type** tab is active by default after opening the **Table of Contents, Index and Bibliography** dialog box to insert the TOC. It contains the various options, which are as follows:

- **Title:** It displays the TOC. By default it is Table of Contents.
- **Type:** Select the type of table of contents from this drop-down list.
- **Protecting against manual changes:** By default, the checkbox for Protected against manual changes check box is selected. This protects the TOC from any accidental change. If this box is unchecked, then the contents of TOC can be changed directly on the document page, just like any other text on the document.
- **For:** This list allows you to create the table of contents for the entire document or a chapter.
- **Include upto level:** Specify the maximum number of heading level for TOC.
- **Create from:** This option provides three check boxes, Headings, Additional styles and Index entries. In the **Headings**, paragraph formatted with the predefined heading styles are added automatically to the table of the contents in order. When you select the **Additional styles**, the **Assign style** button enable, which open the Assign Styles dialog box appears with some additional styles:



- In the **Index entries**, selection will add up the index entries if done using **Insert → Indexes and Tables → Entry option**.

Step 4: Click on the **Entries** tab. The different options of the Entries tab appear. These options are used to format the entries in the table of contents:



To each heading level visible in Level list box, you can add and delete elements, such as chapter no. and also apply character styles to individual elements. If you click on any level then the structure with the elements represented with codes are appears as given below:

- The **N#** button inserts the heading number or list number of the entry.
- The **E** button represents the entry text.
- The **T** button represents a tab stop.
- The **#** button represents the page number.
- The **LS** button represents the start of a hyperlink. (This button does not appear on the default Structure line.)
- The **LE** button represents the end of a hyperlink. (This button does not appear on the default Structure line.)

Each white field on the Structure line represents a blank space.

PURE FACT

If you insert a hyperlink, you must indicate both the beginning and end of the link.

Delete an Element

To delete an element from the **Structure line** given above just click the element button and then press the **Delete** key on your keyboard. For example, to delete a tab stop, click the T button and then press the Delete key.

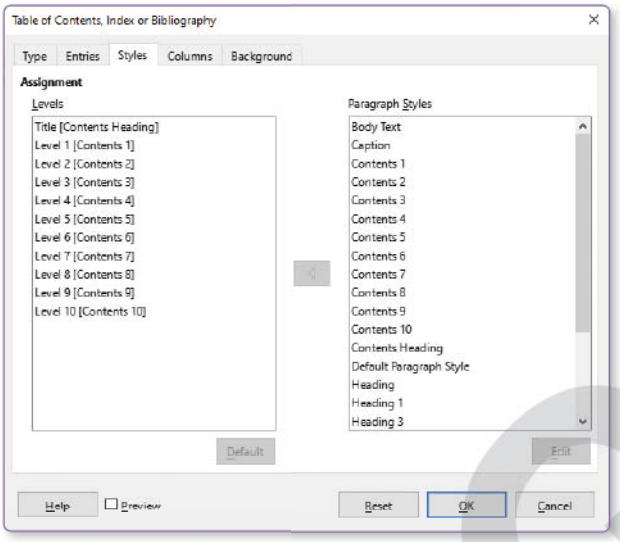
Add an Element

To add an element just place the cursor in the white space to the left of the selected element. Let us add a tab stop, click the white space before the Tab stop button. A button representing the new element appears on the Structure line.

Applying Character Style

The Character Style is used to apply a character style to an element on the Structure line. For this, select the element from the structure line and select the style from the **Character Style** drop-down list.

Step 5: Click on the **Styles** tab. Use this tab to apply paragraph styles to the table of contents. You can apply a different paragraph style to different levels of the table of contents as shown below:



The steps to **apply a paragraph style** to a heading level are as follows:

i. Click on the desired outline level in the **Levels** list box.

ii. Click the paragraph style that you want to apply in the **Paragraph Styles** list box.

iii. Click on the '<' button.

The steps to **remove a paragraph style** from a heading level are as follows:

i. Click on the desired outline level from which you want to remove style in the Levels list box.

ii. Click on Default button below the Levels list box.

The steps to **edit style** are as follows:

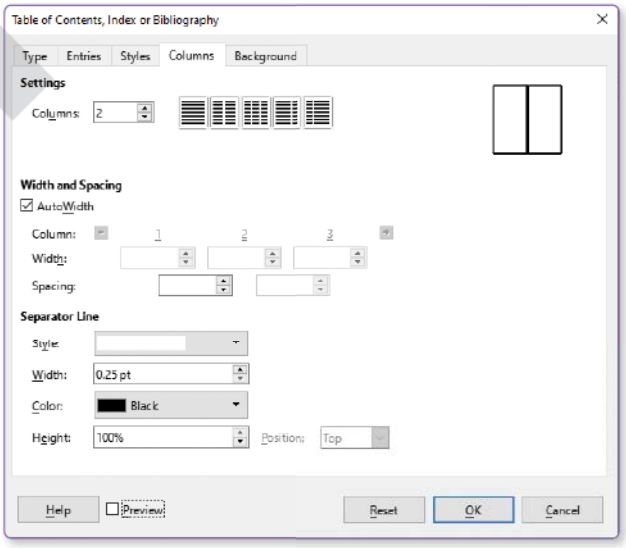
i. Select the desired style in the **Paragraph Styles** list box.

ii. Click on the **Edit** button. The **Paragraph Style** dialog box appears.

iii. Specify the desired setting for the selected paragraph style.

iv. Click on the **OK** button.

Step 6: Click on the **Columns** tab in the **Table of Contents, Index and Bibliography** dialog box. The options related to the **Columns** tab appear.



The description of the options of this tab is as follows:

- **Columns:** This option allows us to divide the table of contents into columns.
- **Column:** This option allows to view columns.
- **Width:** This option allows to set the width of the columns.
- **Spacing:** This option allows to set the spacing between columns.
- **Separator Line:** This allows to set the style, width, colour, and height of the separator line.

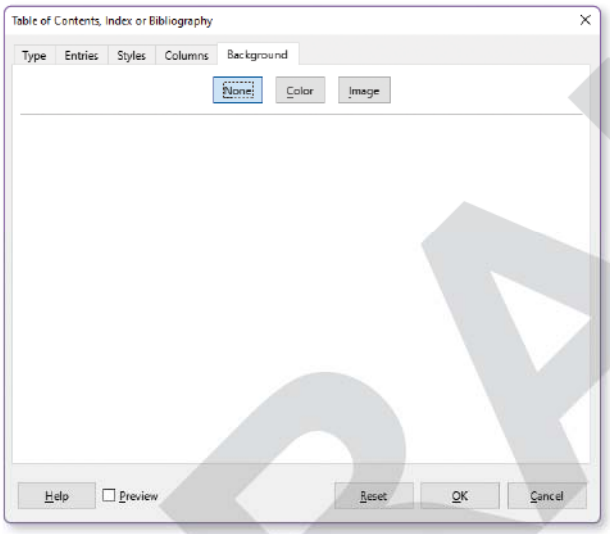
Step 7: Click on the **Background** tab. It is used to add background to the table of contents. You can set the colour as well as the graphics to the background of the table of content. When you click the **None** button, then background colour will be removed. When you click the **Color** button, then you can set the background colour to the table of content. To do this, perform the following steps:

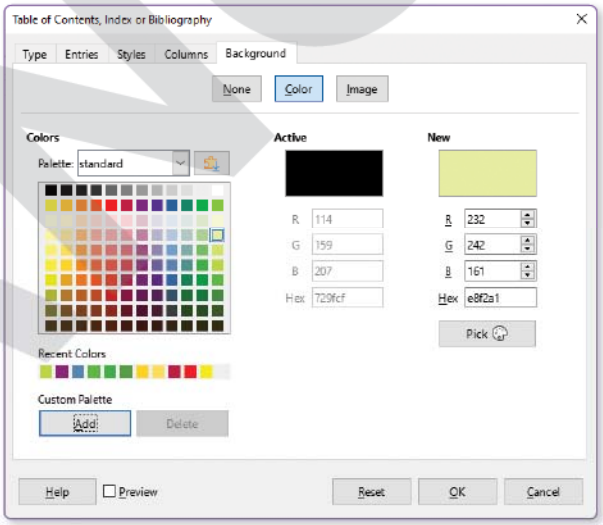
i. Click on the **Color** button. The options related to the background colour is displayed on the **Table of Contents, Index or Bibliography** dialog box.

ii. Select the desired colour from the **Colors** palette.

The selected colour will appear in the **New** section with their RGB value.

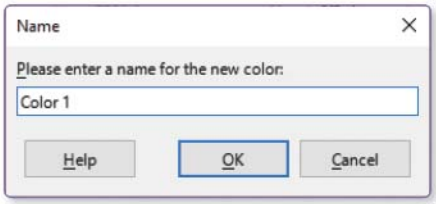
iii. Click on the **Add** button below the **Custom Palette** section to add the selected colour to the custom palette.





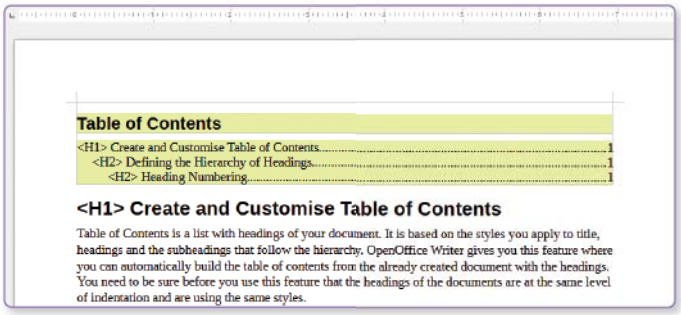
The **Name** dialog box opens.

iv. Type the name for the colour in the **Please enter a name for the new color** text box and click on the **OK** button.



Now, the colour is added to the **Custom** pallet can be reused according to the requirement.

v. Click on the **OK** button to apply the desired colour to the table of content.



When you click the **Image** button, then you can set the graphics as background to the table of content. To do this, perform the following steps:

i. Click on the **Image** button. The options related to the background colour is displayed on the **Table of Contents, Index or Bibliography** dialog box.

ii. Select the desired image from the **Image** list box.

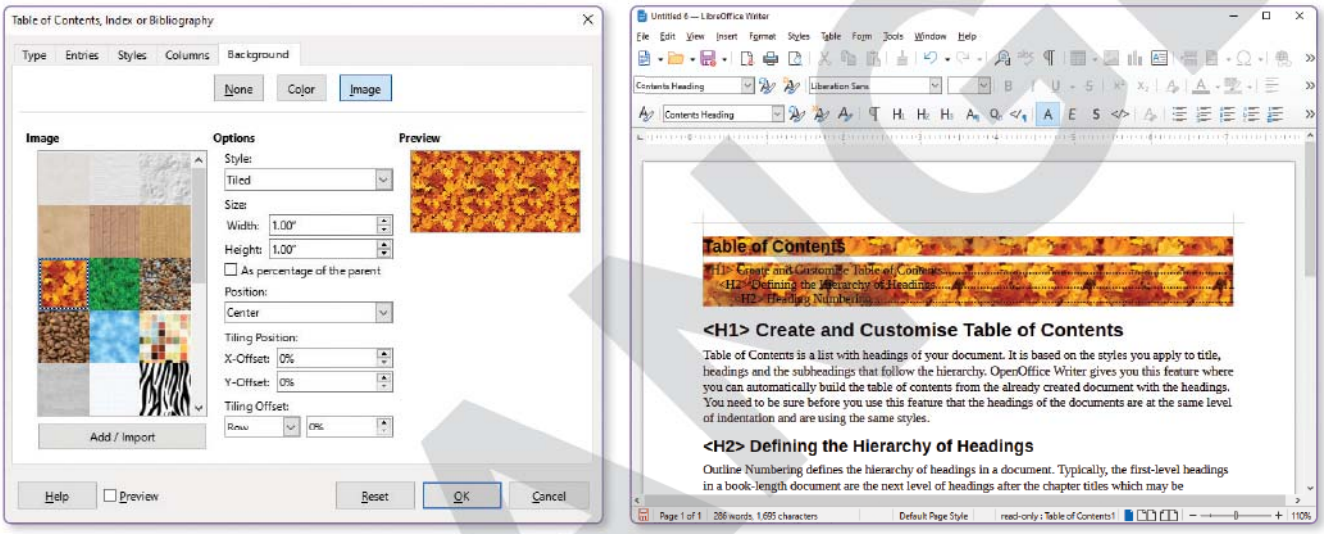
OR

Click on the **Add/Import** button and navigate and select the desired image from the **Add Image** dialog box.

iii. Specify the different settings in the **Options** sections, such as Style, Size (Width and height), Position, Tiling Position, and Tiling Offset.

iv. Click on the **OK** button, as shown in below figure:

The image sets as the background of the table of content, as shown in below figure:



Deleting Colour or Image from the Background

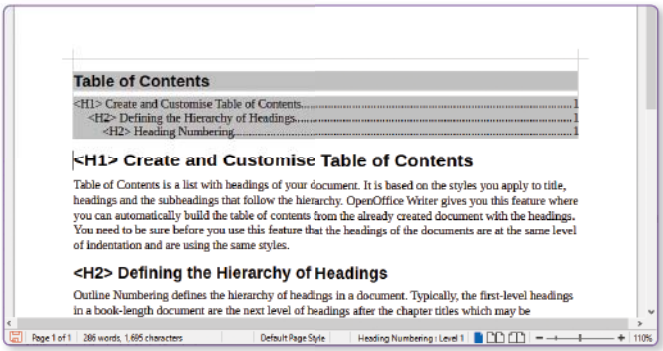
The steps to delete colour or Image from the table of content's background are as follows:

Step 1: Click on the **Background** tab in the **Table of Contents, Index or Bibliography** dialog box.

Step 2: Click the **None** button in the **Background** tab.

Saving the Table of Contents

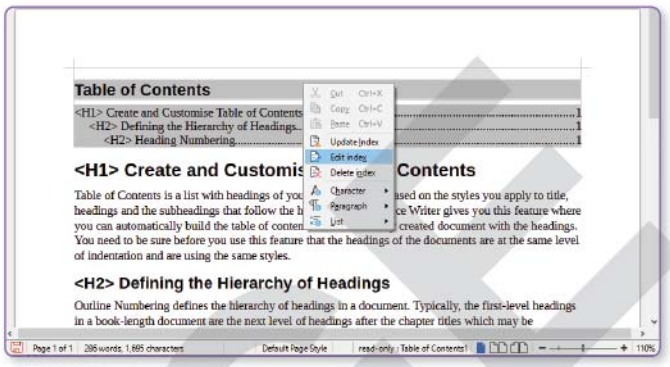
After all the above changes are done in all the five tabs the changes can be saved and implemented by clicking on **OK** button. After this **Table of Contents, Index or Bibliography** dialog box will be closed and the table of contents will appear according to the specified settings, as shown in below figure:



Note that all the headings will appear with page numbers in the TOC. The entries in the TOC are hyperlinked. Moving a mouse pointer over any of the entries will show a tool tip stating to press Ctrl+click to open hyperlink followed by the heading title. Pressing Ctrl+click the cursor will directly move on to the selected section heading.

Customise/Editing a Table of Contents

To edit a table of contents created in a document, follow the given steps:



Step 1: Go to any part of the table of contents.

Step 2: Right-click to open the context menu and select **Edit Index** option.

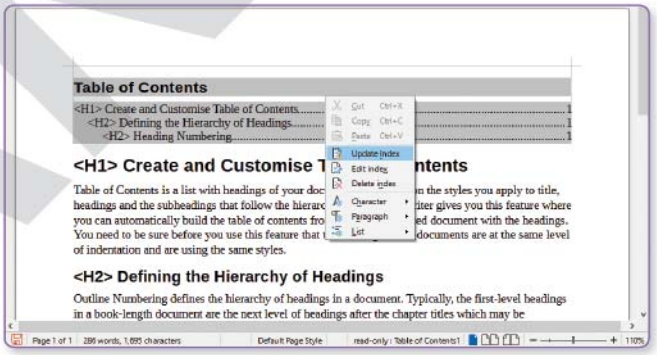
The **Table of Contents, Index or Bibliography** dialog box opens and you can edit and save the table of content using the five tabs as learnt above. The changes made will be reflected in the **Preview** section of the dialog box.

Maintaining a Table of Contents

As we know now that a table of contents is a snapshot of the entire document at any given point of time. If any changes are made to the document section headings or page numbering, it should be reflected in the Table of Contents as well. Maintaining a table of contents consists of updating and deleting the TOC.

Updating a Table of Contents

Sometime, when you update the heading in the table, then you need to update a table of contents created in a document. To do this, follow the given steps:



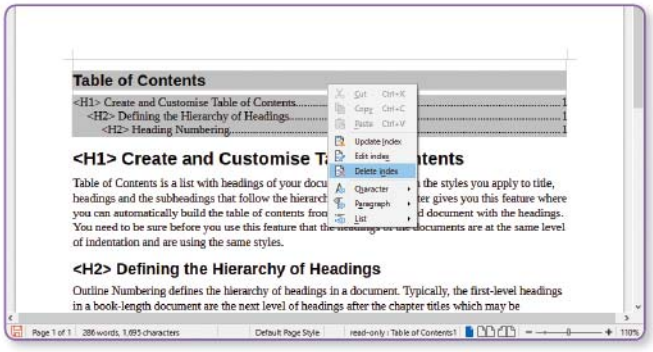
Step 1: Go to any part of the table of contents.

Step 2: Right-click to open the context menu and select **Update Index** option.

The table of contents will be updated.

Deleting a Table of Contents

To delete a table of contents created in a document, follow the given steps:



Step 1: Go to any part of the table of contents.

Step 2: Right click to open the context menu and select **Delete Index** option.

It is always advisable to be double sure before you go for this option as the table of contents will be deleted without any prompt for confirmation.

Quiz Bee

State True or False.

1. You can type the table of contents manually. _____
2. Table of contents displays the headings randomly without any hierarchy. _____
3. LS button doesn't appear on the default Structure line. _____
4. Existing template cannot be edited and reset. _____

REVISIT

- A style is a collection of different formatting saved by a specific name and then applied to different sections of the documents containing text, tables, lists, etc.
- Writer provides various types of styles, which are paragraph styles, character styles, frame styles, page styles, list Styles, and table styles.
- You can apply style quickly by clicking on the Fill Format Mode icon.
- A picture is a digital image, which is represented in finite set of digital values 0 or 1, known as pixels.
- The Image Mode tool helps you change the mode of the image.
- Color tool present on the Image toolbar helps you to change the RGB colour combinations along with brightness, contrast, and gamma of the image.
- Rotating an image in LibreOffice Writer serves multiple purposes, including alignment for better integration with text, enhancing visual appeal by adding dynamism to the layout, proficiently managing space limitations, drawing attention to specific details within the image, etc.
- Resizing is the process of reducing or enlarging the size of the image.
- The Drawing Toolbar is a collection of tools used for drawing objects and giving effects to these objects.
- Grouping of the drawing objects is the process of combining two or more objects to behave as one object.
- Anchoring refers to the reference point for the graphics.
- Arrangement refers to the order in which objects or image appear relative to each other.
- Alignment refers to the vertical or horizontal placement of a graphic in relation to the chosen anchor point.
- Text wrapping allows the placement of image in relation to text.
- A template is a predefined layout or a blueprint of a document with saved formatting features like font styles, logos, borders, colour pattern, text design, etc.
- Wizard is a process of doing work using a step by step dialog box.
- Exporting templates in LibreOffice Writer lets users create a consistent format for their documents, which they can share with others.
- Track Changes is a feature that facilitates the process of commenting, modifying, and reviewing a document among multiple users.
- Table of Content is a list of topics and subtopics that have been covered in the document along with page numbers.
- Heading Numbering defines the hierarchy of headings in a document.

Solved

SECTION A (Objective Type Questions)

A. Choose the correct option.

1. Which of the following acts as a container that can hold text, graphics, and lists?
   a. Frame
   b. Paragraph
   c. Character
   d. Style
2. Which of the following keys is used to start and end a paragraph?
   a. Esc
   b. Spacebar
   c. Enter
   d. Tab
3. _____ are used for determining the appearance of bulleted or numbered lists, including the type of bullets or numbering, indentation, and spacing.
   a. Paragraph
   b. Page
   c. Frame
   d. List
4. _____ is a feature that facilitates the process of commenting, modifying, and reviewing a document among multiple users.
   a. Macros
   b. Track Changes
   c. Templates
   d. Styles
5. The _____ style is used to apply a character style to an element on the structure line.
   a. Character
   b. Table of content
   c. Template
   d. Wizard
6. _____ refers to the reference point for the graphics.
   a. Crop
   b. Rotate
   c. Anchor
   d. Handle
7. _____ refers to the vertical or horizontal placement of a graphic in relation to the chosen anchor point.
   a. Paragraph
   b. Alignment
   c. Margin
   d. Wrap text
8. A _____ is a predefined layout or a blueprint of a document with saved formatting features.
   a. Macro
   b. Wizard
   c. Comparing
   d. Template
9. The transparency of the image increases to give it a _____ effect.
   a. Watermark
   b. Blur
   c. Grayscale
   d. Formatted
10. Which of the following options increases the contrast of the image?
    a. Invert
    b. Sharpen
    c. Solarization
    d. Aging
11. Which of the following steps are to be followed to create a Table of Contents?
    a. File > Table of Contents and Index > Table of Contents, Index or Bibliography > OK
    b. View > Table of Contents and Index > Table of Contents, Index or Bibliography > OK
    c. Insert > Table of Contents and Index > Table of Contents, Index or Bibliography > OK
    d. Format > Table of Contents and Index > Table of Contents, Index or Bibliography > OK

12. Varun wants the name of the school to appear in the middle of the document. Help him to find out the feature to do so?
    a. Watermark b. Template
    c. Style d. Format
13. Which of the following copies the style of an existing content and then applies to the area selected after that?
    a. Fill Format Mode b. Fill Mode
    c. Format Mode d. Insert Mode
14. Which of the following options from the Image toolbar is used to rotate the selected image 90 degree to left?
    a. Rotate 90° Right b. Rotate 90° Left
    c. Rotate d. Flip Horizontally

Ans. 1. a 2. c 3. d 4. b 5. a 6. c 7. b 8. d 9. a 10. b 11. c 12. a 13. a 14. b

B. Fill in the blanks.

1. A _____ is a group of formats saved by a specific name and then applied to different sections of the documents.
2. _____ style(s) act as bookmarks in a document.
3. _____ is a process of doing work using a step by step dialog box.
4. _____ defines the hierarchy of headings in a document.
5. The _____ tool helps you change the mode of the image.
6. In the Filter Tool, _____ displays the image as a group of pixels.
7. _____ pane is used to apply, create, edit, add and remove formatting styles.
8. The _____ option in the Filter tool softens the contrast of the image.

Ans. 1. Style 2. Predefined Heading 3. Wizard 4. Heading Numbering 5. Image Mode 6. Mosaic 7. Styles 8. Smooth

C. Match the following

1. Paragraph Styles	a. Styles
2. F11	b. Open Gallery
3. Smooth	c. Templates
4. Alt+3	d. Tab Stops
5. Insert image	e. Softens the contrast
	f. Drag and Drop

Ans. 1. d 2. a 3. e 4. b 5. f

D. State whether these statements are true or false:

1. Both the types of styles, whether user-defined or predefined, can easily be modified in LibreOffice Writer. _____
2. An image may or may not always have an anchor point. _____
3. Fill Format Mode is basically a shortcut for applying style. _____
4. You cannot link the image file in the document by clicking the Link check box in the Insert Image dialog box. _____
5. Any modification you do in an existing style will be applicable only in the current document. _____

Ans. 1. True 2. False 3. True 4. False 5. True

SECTION B (Subjective Type Questions)

A. Short answer type questions:

1. What are the two ways to apply an existing style?

Ans. There are two ways to apply an existing style:

- By using Style pane
- By using Fill Format Mode

2. What are the two ways of creating new style?

Ans There are two methods of creating a new style which are as follows:

- Creating New Style from Selection
- Creating New Style by Drag and Drop

3. Name the arrangement options that are available in the LibreOffice Writer.

Ans Bring to Front, Forward One, Back One, and Send to Back.

4. What are character styles?

Ans Character styles are used to change the appearance of a part of a paragraph without affecting the other part. It includes font name, font size, bold, italics, underline, superscript, subscript, etc.

5. What is text wrapping?

Ans Text Wrapping allows the placement of image in relation to text. Text wrapping is essential for integrating graphics seamlessly into the text flow of a document.

6. Define the term cropping of an image.

Ans Cropping an image involves removing unwanted portions of the image to focus on a specific area or to improve its composition. It is equivalent to using a scissor to cut the unwanted part.

7. What are the tabs in the Table of Contents, Index and Bibliography dialog box?

Ans There are five tabs in this dialog box:

- Type: This sets the title and type of the TOC.
- Entries: This sets the table of contents entries.
- Styles: This format the entries in the table of contents.
- Columns: This puts the table of contents in two or more columns if needed.
- Background: This gives background colour to the table of contents.

8. Differentiate between Aging and Posterize graphic filters.

Ans Aging: It brings the impact of time with the age.

Posterize: It makes the image appear like a poster with less colour combinations.

B. Long answer type questions:

1. What are the different ways to insert an image?

Ans The image file saved in a computer can be inserted using any of the given methods:

a. Inserting an image using Insert menu
b. Inserting an image using Drag and Drop method
c. Inserting an image using Copy and Paste option
d. Inserting an image using a scanner
e. Inserting an image by linking
f. Inserting an image from LibreOffice Gallery

2. What are the options available under anchoring? Explain.

Ans The following anchoring options are available in the LibreOffice Writer:

- To Page: The object or image remains in the same position in relation to the page margins. It does not move after adding or deleting text or other images. This method is useful when the object or image is not required to be visually associated with a particular piece of text.

- To Paragraph: The object or image is visually associated with a paragraph and moves along the paragraph too. It may be placed in the margin or another location.
- To Character: The object or image is associated with a character but is not in the text sequence. It moves with the c but can be placed in the margin or another location.
- As Character: The object or image is placed in the document like any other character, and therefore, affects the height of the text line and the line break. The graphic moves with the paragraph as we add or delete text before the paragraph. This method is useful for keeping screenshots in sequence in a procedure (by anchoring them as a character in a blank paragraph) or for adding a small (inline) icon in sequence in a sentence.
- To Frame: If the object or image has been placed in a frame, we can anchor the graphic in a fixed position inside the frame. The frame can then be anchored to a page, paragraph or character as required.

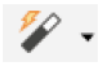
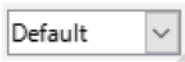
3. Explain the different types of styles supported by LibreOffice Writer.

Ans

- Paragraph styles: They are used for formatting the paragraphs such as text alignment, tab stops, line spacing, and borders, and can include character formatting.
- Character styles: They are used for selected text in a paragraph. It includes font name, font size, bold, italics, underline, superscript, subscript, etc.
- Frame styles: They are used for formatting frames applied to images and text in a document. It includes borders, backgrounds and columns.
- Page styles: They are used for formatting the pages. It includes margins, headers and footers, borders and backgrounds.
- List Styles: They are used for determining the appearance of bulleted or numbered lists, including the type of bullets or numbering, indentation, and spacing.
- Table Styles: They are used for determining the appearance of tables, including borders, shading, alignment, and text formatting within table cells.

4. Explain any four tools from an image toolbar.

Ans

	Filter	It is also known as an image filter bar. It has various filters which can be used on the selected image.
	Image mode	It helps you to change the modes of the image to Grayscale, Black/ White, and Watermark.
	Crop Image	It crops an image.
	Flip Vertically	It flips the selected image vertically.

5. Elaborate the options available for cropping using an Image dialog box.

Ans The options available for cropping using an Image dialog box are as follows:

- Keep Scale: It means the resizing of the image will not occur when the cropping of an image is done. This will cut the unwanted part of the image without altering its size.
- Keep image size: The image size will enlarge when the green handles are dragged towards outwards. The image size will be reduced when dragged towards inwards.
- Left, Right, Top, and Bottom: Cropping will occur from left, right, top and bottom by typing the values. These values will work according to the choice made between Keep scale and Keep image size.
- Width and Height: The Width and Height fields are given both for Scale and for Image size. You can alter depending on the option selected.

C. Competency-based/Application-based questions:

21st Century Skills #Communication #Leadership & Responsibility

1. Arshia wants to invite friends and family for her grandparents 75th birthday celebration. Help her in steps for mailing the invitation letter to all of them using LibreOffice Writer.

Ans. Arshia can use the mail merge feature of the LibreOffice Writer.

2. Vedika wants to design her lab report with specific styles for paragraphs, background, numbering, and graphics. Help her with the steps to design her lab report.

Ans. Vedika can use the Style pane of the LibreOffice Writer to design her lab report.

3. Amrita is celebrating her 14th birthday. She wants to use the mail merge feature to invite friends and family members but is not aware of the files used in the mail merge. Help her by giving an explanation of each file.

Ans. There are three important files involved in this process:

- Main Document: It is the document which has a common letter or the invitation that needs to be sent to multiple recipients. We can either create this before we start with the mail merge process or it can be created in the first step of the mail merge wizard.
- Data Source: It is a data file which contains the mailing address from a database or spreadsheet or tabular data in the OpenOffice Writer.
- Merged File/Form Letter: It is the merged document that will be obtained after the data source file and the main document is merged during the process of Mail Merge.

4. Smridhi wants to design a card for her friend on her birthday. Help her do this by using LibreOffice Writer.
   a. Which toolbar will she use in LibreOffice Writer to do so?
   b. Give the steps to draw a line in the document.
   c. List any two text wrapping options available in a word processing software.
   d. Give the steps to add a watermark effect to an image.
   e. Give the steps to ungroup different objects created in a document.

Ans. a. She may use Drawing toolbar.

b. To draw a line, follow these steps:

Step 1: Click on the Line tool from the Drawing toolbar.

Step 2: Drag on the position where you want to draw a line.

c. Before, After, Parallel, Wrap Through

d. Select the View → Toolbars → Image → Transparency=80%

e. Steps to ungroup objects are as follows:

Step 1: Select the object.

Step 2: Select the Format → Group → Ungroup option.

5. Arshia wants to make consistent formatting of the major portion of the project to save her from using the formatting steps again and again.
   a. Name the feature that will help her improve consistency in a document and also make major formatting changes easy.
   b. Explain any two of its different types.

Ans. a. The feature that will help her improve consistency in a document and also make major formatting changes easy is Styles.

b. Different types of styles are as follows:

- Page styles: Used for formatting the pages. It includes margins, headers and footers, borders and backgrounds.
- Paragraph styles: Used for formatting the paragraphs such as text alignment, tab stops, line spacing, and borders, and can include character formatting.

Assertion and Reasoning Questions:

Direction: Questions 6-7, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions by selecting the appropriate option given below:

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

6. **Assertion (A):** Interactive documents with graphics are easier to understand than plain text documents.
Reasoning (R): Our brains process visual information faster than text.

Ans. a

7. **Assertion (A):** Using styles in LibreOffice Writer saves time when formatting documents.
Reasoning (R): Styles allow you to save a set of formatting options with a specific name and apply them throughout the document.

Ans. a

Unsolved

SECTION A (Objective Type Questions)

A. Choose the correct option.

1. Which of the following file formats cannot be inserted as image into a document?
   a. .PNG
   b. .JPG
   c. .TXT
   d. GIF

2. The _____ tool has a drop-down arrow which expands to show various filters that can be applied on the selected image.
   a. Filter
   b. Drag and Drop
   c. Insert
   d. Gallery

3. Drag and Drop method cannot be used to create a _____ style.
   a. Page
   b. Paragraph
   c. Both a and b
   d. None of these

4. Saurabh has made an advertisement in Writer. He is facing difficulty in positioning the images within the text. Suggest him how he can adjust the image? [CBSE Sample paper 2023]
   a. Wrap text
   b. Crop
   c. Alignment
   d. Layout

5. In the custom styles, each _____ field on the Structure line represents a blank space in a document. [CBSE Sample paper 2023]
   a. Black
   b. White
   c. Blue
   d. Yellow

6. _____ means the resizing of the image will not occur when the cropping of an image is done.
   a. Keep scale
   b. Keep image size
   c. Wrap
   d. Borders

7. Suresh has been assigned a task to create multiple documents such that the first page of every document contains the logo in a particular style. Which feature of LibreOffice Writer can be used to complete the task quickly? [CBSE 2023]
   a. Cell styles
   b. Image
   c. Template
   d. Table of Contents

8. It is a reference point for the graphics which are created while positioning any image. This point could be the page, or frame where the object is either a paragraph, or even a character in a word processor. [CBSE sample paper 2022]
   a. Wrap Text
   b. Anchoring
   c. Alignment
   d. BookMark

9. John has written a book consisting of fifteen chapters. He wanted to make the index of the book. Suggest him the option used to create the index automatically in a word processor. [CBSE sample paper 2022]
   a. Tables
   b. Columns
   c. Styles
   d. Table of Contents

10. In LibreOffice Writer by default, evaluates _____ levels of headings when it builds the table of contents. [CBSE sample paper 2022
    a. 3 b. 10
    c. 7 d. 12
11. _____ styles in a text document affect selected text within a paragraph, such as the font and size of text, or bold and italic formats. [CBSE Sample paper 2021]
    a. Cell b. Paragraph
    c. Formatting d. Character
12. _____ controls how graphics are stacked upon each other or relative to the text. [CBSE Sample paper 2021]
    a. Arrangement b. Alignment
    c. Anchoring d. Wrapping
13. Prisha is a book editor. She wants to change the indentation of all paragraphs, and change the font of all titles in the book. Which feature she should use to make the task easy? [CBSE Sample paper 2021]
    a. Styles b. Templates
    c. Table of contents d. Consolidating
14. Gaurav has inserted an image in a document. He wants to remove the unwanted area of the image. Which option of the LibreOffice Writer will he use to complete the task? [CBSE Sample paper 2021]
    a. Clip art b. Cut
    c. Crop d. Contrast

B. Fill in the blanks.

1. _____ is a collection of objects like graphics and sound files that can be easily inserted in a document.
2. The _____ button inserts the heading number or list number of the entry.
3. _____ option moves the selected object to the front of all other objects.
4. _____ controls how graphics are stacked upon each other or relative to the text.
5. The _____ menu is used to define the hierarchy of headings in a document.
6. In Filter Tool, _____ makes the image wholly or partially reverse in the tone.
7. If the scanner is connected to the computer and you wish to insert a scanned image, then Insert-> _____ option can be used.
8. _____ an image means to make changes in an image like crop, resize, add border, etc.
9. When you apply a _____, you apply a group of formatting effects together in one single step.
10. The _____ option of the Filter tool displays the image in the modern art style.

C. State whether these statements are true or false:

1. Relief option in the Filter tool displays a dialog box to adjust the light source to give a shadow effect. _____
2. A document with text is easier to grasp than a document with graphics. _____
3. It is not possible to create a default template in the LibreOffice Writer. _____
4. A template is a model that you use to create other documents. _____
5. A text always has an anchor point. _____

SECTION B (Subjective Type Questions)

A. Short answer type questions:

1. What is the reference point of graphics?
2. Under which menu, Alignment, Arrange, Wrap feature of an image can be accessed?
3. What is the difference between To Foreground and To Background options while arranging images?

4. Explain any four button used in Table of Contents.
5. Explain any four effects of Filter tool.

B. Long answer type questions:

1. What is the difference between cropping and resizing?
2. Give the steps to crop and image.
3. Write down steps to group different drawing objects together.
4. What is text wrapping? Explain the wrapping options available in LibreOffice Writer.
5. Explain the feature of comparing documents in LibreOffice Writer. Give steps for the same.

C. Competency-based/Application-based questions:

#Communication
#Leadership & Responsibility

1. Shinjini wants to design a birthday card for her friend's birthday. List down the important features she can use to design the birthday card.
2. Advika wants to add a few images in her project. She is not aware of different ways of adding images. Help her by giving some of the different methods of adding an image in a document.
3. Anya is working on a document. She is making her Science project and wants to use few graphical tools of the software:
   a. Give the steps to draw a rectangular box in the document.
   b. List any two text wrapping options available in a word processing software.
   c. Give the steps to give a watermark effect to an image.
   d. Give the steps to group different objects created in a document.
4. ABC publisher wants to add an index in the book. Which feature of LibreOffice Writer will help them to create an index page. Give the steps to use this feature.

Assertion and Reasoning Questions:

Direction: Questions 5-6, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions by selecting the appropriate option given below:

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

5. **Assertion (A):** Text wrapping is essential for integrating graphics seamlessly into the text flow of a document.
   Reasoning (R): Text wrapping tools are found under the Drawing Object Properties toolbar.
6. **Assertion (A):** Track Changes is a useful tool for collaborative document editing in LibreOffice Writer.
   Reasoning (R): Track Changes allows users to modify the source document directly.

UNIT 2

Electronic Spreadsheet (Advanced)

TOPICS COVERED

- Data Consolidation
- Using What If Scenarios
- Using Goal Seek
- Linking Data and Sheet
- Record Changes in a Spreadsheet
- What are Macros?
- Groups and Subtotals
- Using What If Analysis
- Using Solver
- Sharing Spreadsheet
- Comments in Spreadsheet

Data analysis plays a pivotal role in modern organisations for numerous reasons. Data analysis helps organisations in various tasks such as informed decision-making, problem-solving, understanding customer behaviour, improving efficiency, performance evaluation, and risk management. It is required to study the trends of products required in the local and global market. It is an important part of many organisations for planning and taking important decisions for the progress of the company.

The LibreOffice Calc offers several built-in tools for data analysis, which are essential for performing various analytical tasks directly within the spreadsheet software. These tools include Data Consolidation, What-if Analysis, Goal Seek, solver and many more. In this unit we will study about these important data analysis tools.

DATA CONSOLIDATION

In LibreOffice Calc, data consolidation refers to the process of combining data from multiple sheets of the spreadsheet into a single sheet by using different built-in functions like sum(), max(), min(), average(), etc. Data consolidation is used to summarise the information for analysing or reporting purposes. The data of similar type from different sheets in the same spreadsheet is picked up, consolidated and saved for further data analysis.

Before consolidating data, you need to check and ensure the following points:

- Look at each sheet in the spreadsheet and make sure the types of data are the same as what you want to consolidate.
- Make sure the labels on each sheet are the same that you used for consolidation.
- Specify the first column as the main column based on which the data will be combined.

Let us take an example of adding the marks of Unit Test (out of 20), Term 1 Exam (out of 40) and Term 2 Exam (out of 40) stored in three different sheets in the same spreadsheet so that the consolidated marksheet of a student can be generated.

The steps to consolidate data are as follows:

Step 1: Create Sheet1 for Unit Test, Sheet2 for Term 1 Exam and Sheet3 for Term 2 Exam in the spreadsheet.

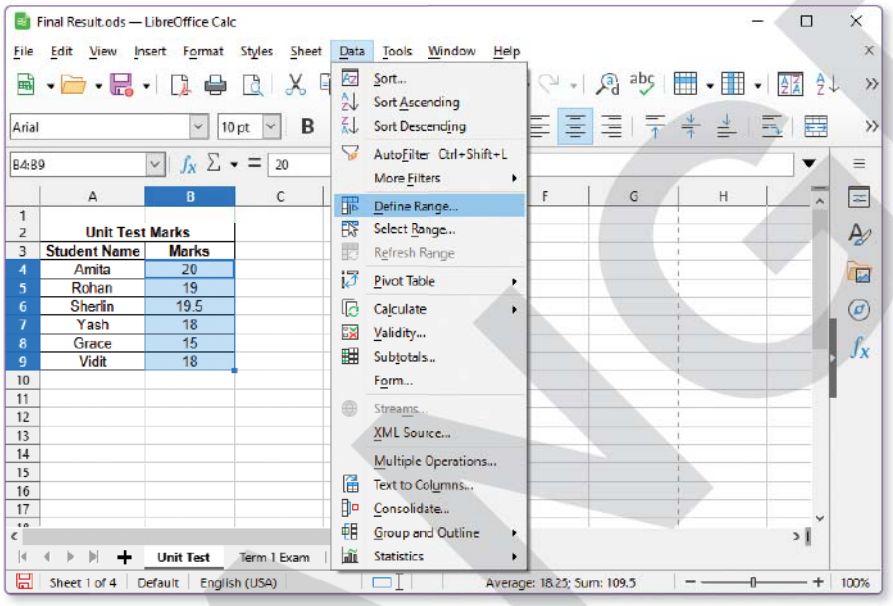
	A	B	C
1			
2	**Unit Test Marks**		
3	**Student Name**	**Marks**	
4	Amita	20	
5	Rohan	19	
6	Sherlin	19.5	
7	Yash	18	
8	Grace	15	
9	Vidit	18	
10			

	A	B	C
1			
2	**Term 1 Exam Marks**		
3	**Student Name**	**Marks**	
4	Amita	38	
5	Rohan	40	
6	Sherlin	35	
7	Yash	39	
8	Grace	40	
9	Vidit	37	
10			

	A	B	C
1			
2	**Term 2 Exam Marks**		
3	**Student Name**	**Marks**	
4	Amita	37	
5	Rohan	39	
6	Sherlin	40	
7	Yash	38	
8	Grace	40	
9	Vidit	36	
10			

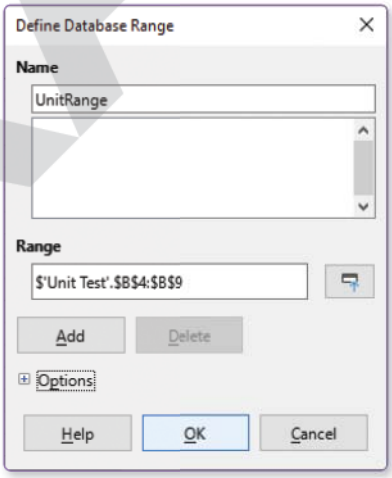
Step 2: Select the range **B4:B9** in the Unit Test sheet.

Step 3: Select the **Data → Define Range** option from the menu bar.



The **Define Database Range** dialog box opens.

Step 4: Specify the range name in the **Name** text box and click on the **OK** button.



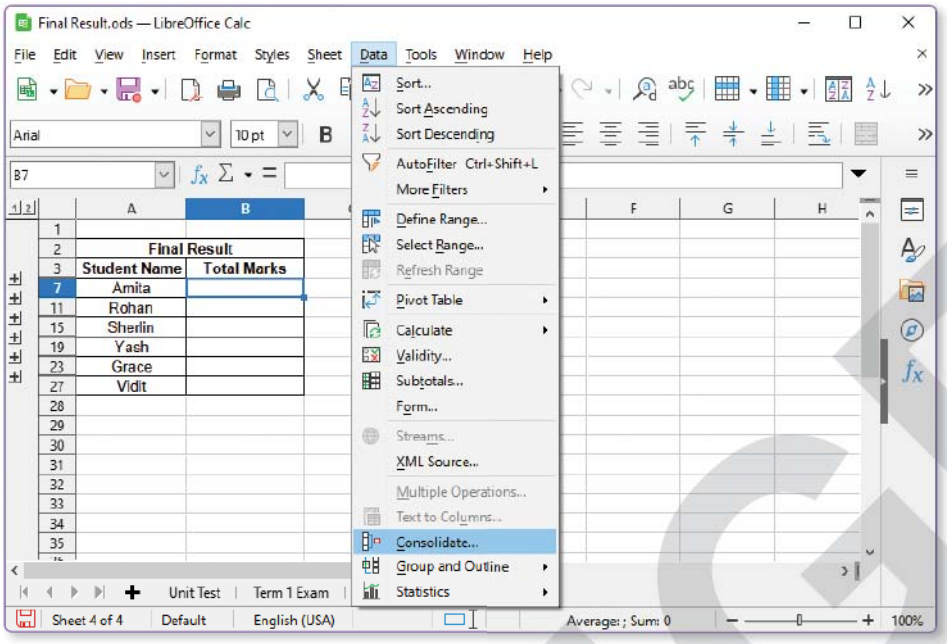
This will give a name to the range you wish to use in the data consolidation.

Step 5: Repeat step 2 to 4 to give a range name for Term 1 Exam and Term 2 Exam sheets.

Step 6: Create Sheet4 and rename it as Final Result for consolidated marks of all three added up to generate the final result.

Step 7: Click on cell **B4**.

Step 8: Select the **Data → Consolidate** option from the menu bar.

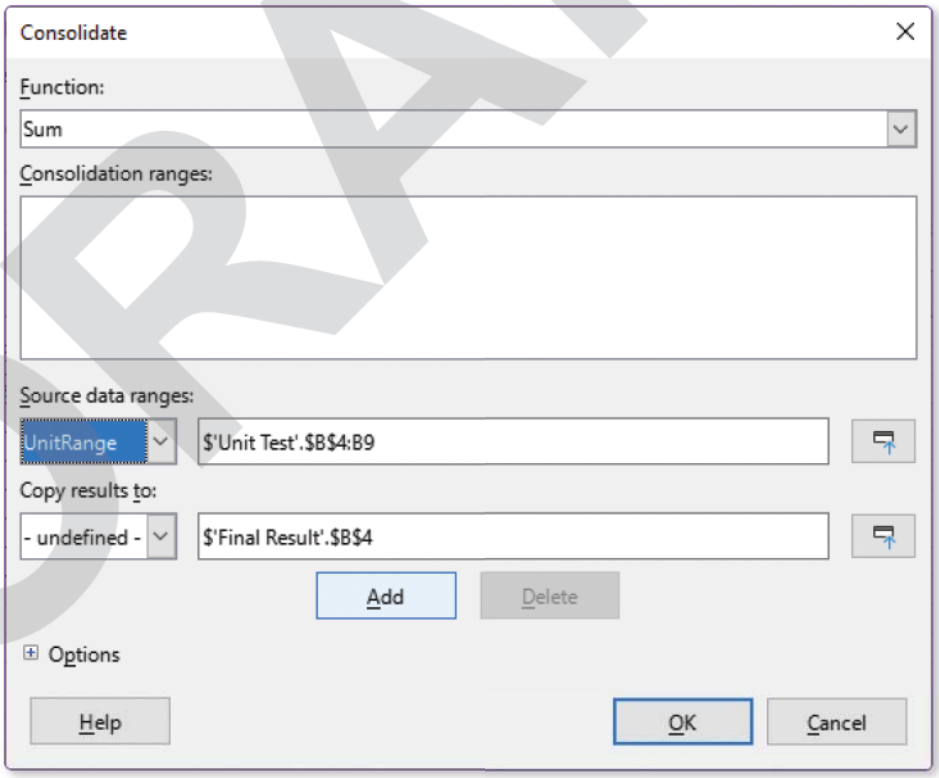


The **Consolidate** dialog box appears. Note that the reference of the cell **B4** of the **Final Result** sheet is displayed in the range **Copy results to** section, which specify where you want to display the result.

Step 9: Click on **Source data range** drop-down list. The data ranges created earlier will be displayed.

Step 10: Select the desired data range names.

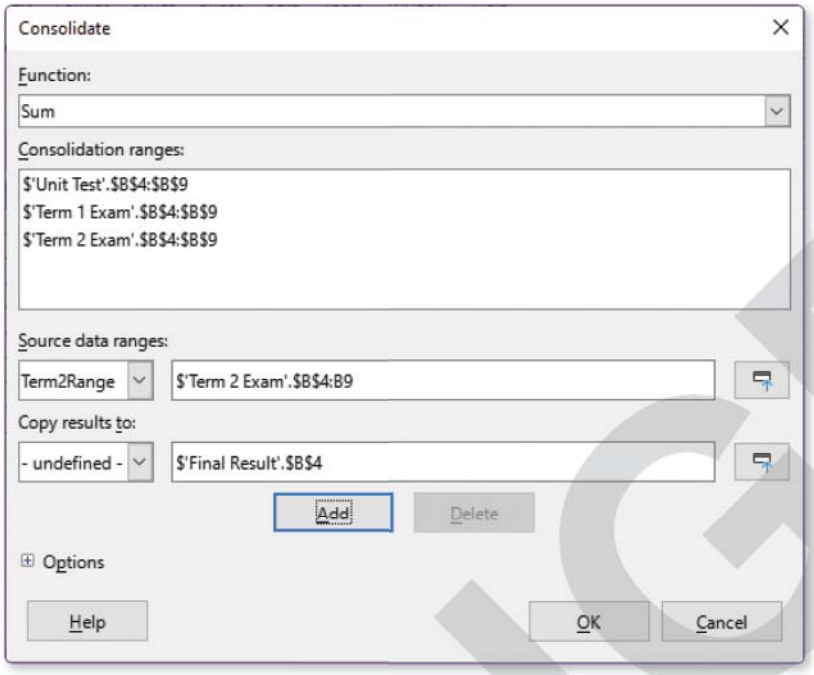
Step 11: Click on the **Add** button.



The data ranges will get added up in the **Consolidation ranges** list box.

Step 12: Repeat steps 9 to 11 to add data ranges needed for data consolidation.

Step 13: Select the required function from **Functions** drop-down list. In this case, we have retained with the default option (i.e. Sum function).

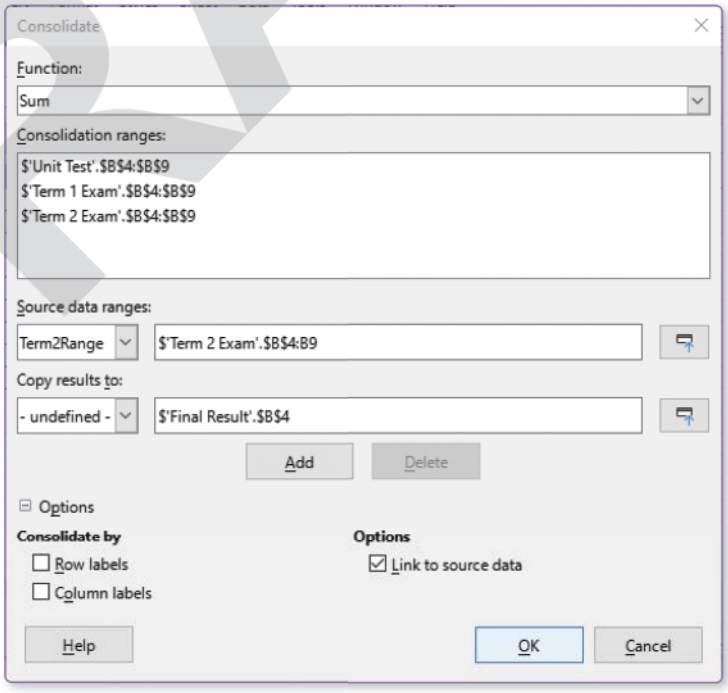


Step 14: Click on the **Options** option. When you click on Options then it will display **Row labels**, **Column labels**, and **Link to source data** checkboxes.

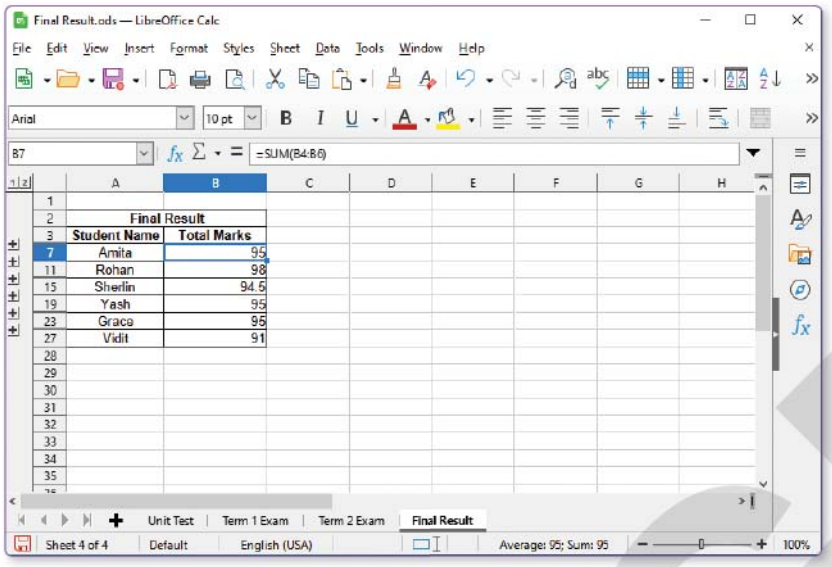
Step 15: Select **Row label** or **Column label** or both checkboxes, if you want to consolidate it by matching the label.

Step 16: Select the **Link to source data** check box. This will link the data consolidated. This will create a dynamic link between the consolidated data and the original source ranges (Unit Test, Term1,Term2). This means that any changes made to the source data will be reflected automatically in the consolidated data.

Step 17: Click on **OK** button.



You will see the consolidated marks in the cells **B4:B9**.



In the above case if any value is changed in source data (Unit Test, Term 1 Exam or Term 2 Exam) then the marks in the Final Result sheet generated will be automatically updated. Try this by changing the marks of Amita in Term 1 Exam from 38 to 40. Did you see any change in the final result generated for Amita?

GROUPS AND SUBTOTALS

In LibreOffice Calc, Groups and Subtotals is a feature that allows users to organise and summarise data within spreadsheets.

You can group rows or columns together to create collapsible sections. This is particularly useful for organising large sets of data, making it easier to navigate and focus on specific parts of the spreadsheet. You can collapse or expand sections to hide or reveal the detailed data within each group.

To group data, perform the following steps:

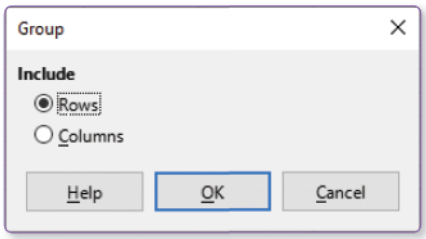
Step 1: Select the **Data → Group and Outline → Group** option from the menu bar. The **Group** dialog box opens.

Step 2: Select the **Rows** radio button to group the data on the basis of rows.

Or

Select the **Columns** radio button to group the data on the basis of columns.

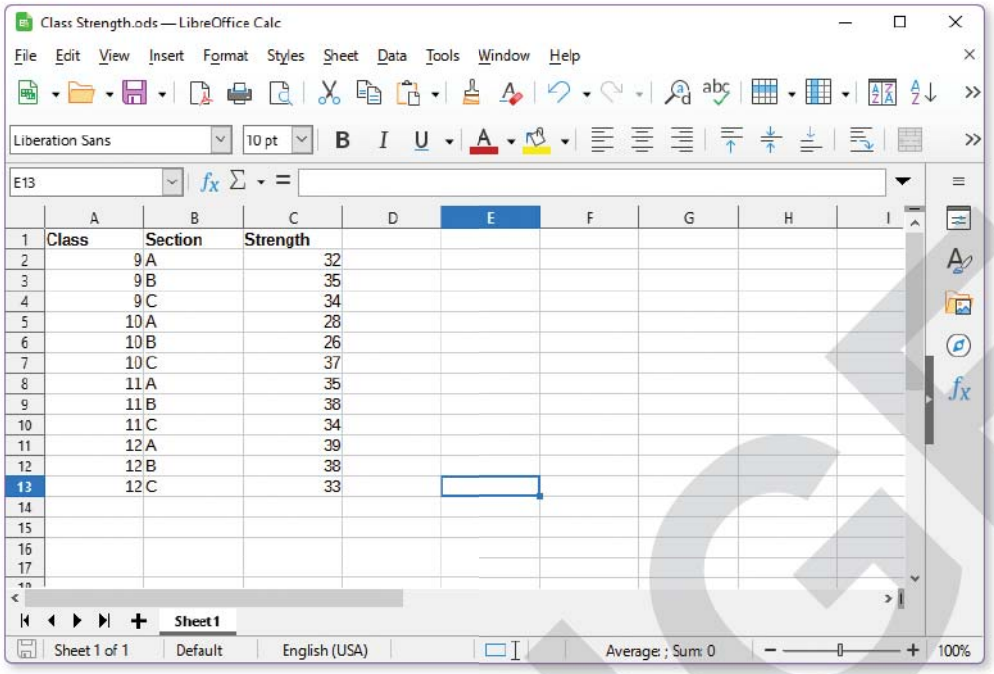
Step 3: Click on the **OK** button.



Creating Subtotals

The Subtotal tool in Calc creates the group automatically and applies common functions like sum, average on the grouped data. It can group subtotals by using category and sorts them in ascending or descending order so that one need not to use filters. For example, you can sum, average, count, etc., the values within each group. This provides a way to generate summary statistics or insights for each section of the data.

Let us take an example of counting the strength class-wise using subtotal as shown in the given spreadsheet:

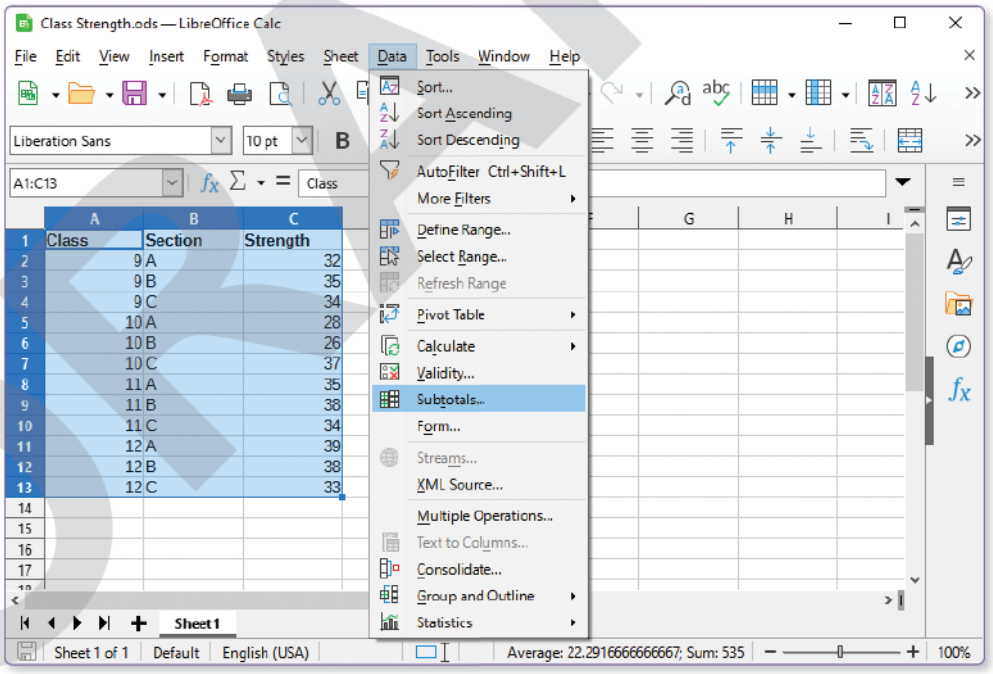


	A	B	C
1	Class	Section	Strength
2	9	A	32
3	9	B	35
4	9	C	34
5	10	A	28
6	10	B	26
7	10	C	37
8	11	A	35
9	11	B	38
10	11	C	34
11	12	A	39
12	12	B	38
13	12	C	33

To insert **Subtotals** values into a spreadsheet, follow the steps given below:

Step 1: Select the range of cells. Ensure that the column labels are created and selected in the range. In the above sheet the range is **A1:C13**.

Step 2: Select the **Data → Subtotals** option from the menu bar.

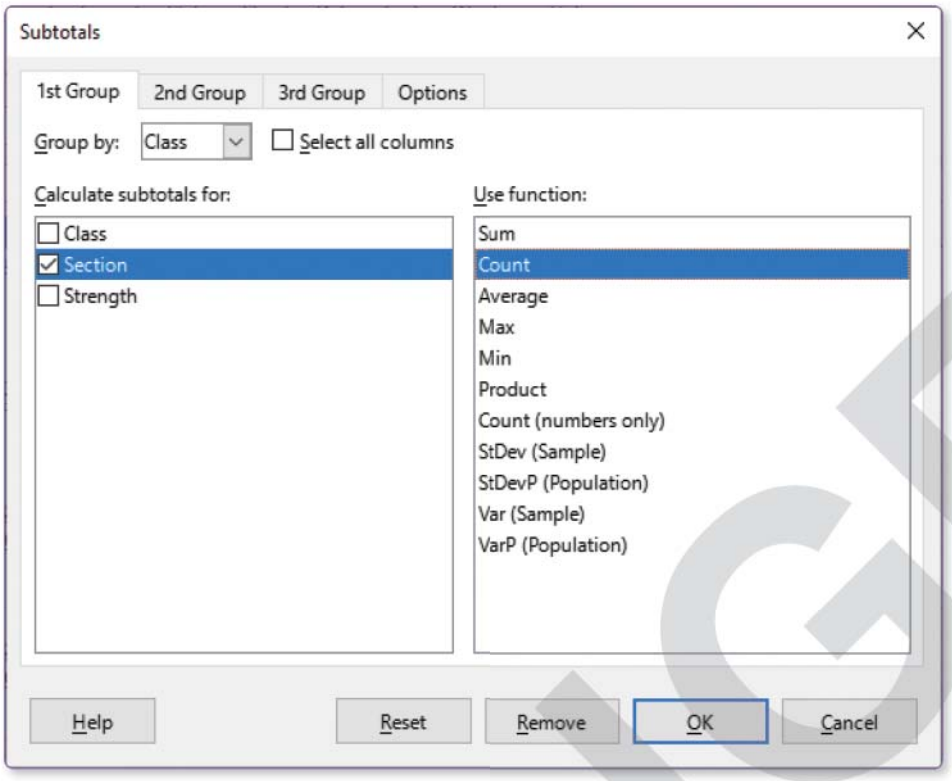


The **Subtotals** dialog box opens with the option of **1st Group** tab.

Step 3: Select the **Class** option from the **Group by** drop-down menu.

Step 4: Select **Section** check box in the **Calculate subtotal for** list box.

Step 5: Select the **Count** function from the **Use function** list box.



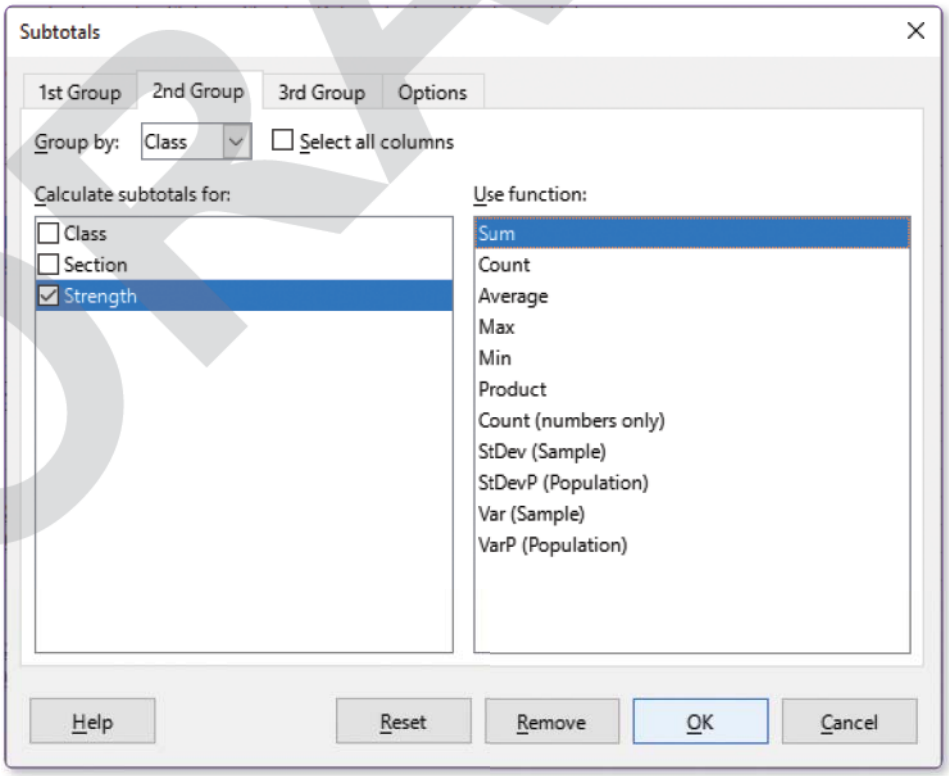
Step 6: Click on the **2nd Group** tab to group the data in further level.

Step 7: Select the **Class** option from the **Group by** drop-down menu.

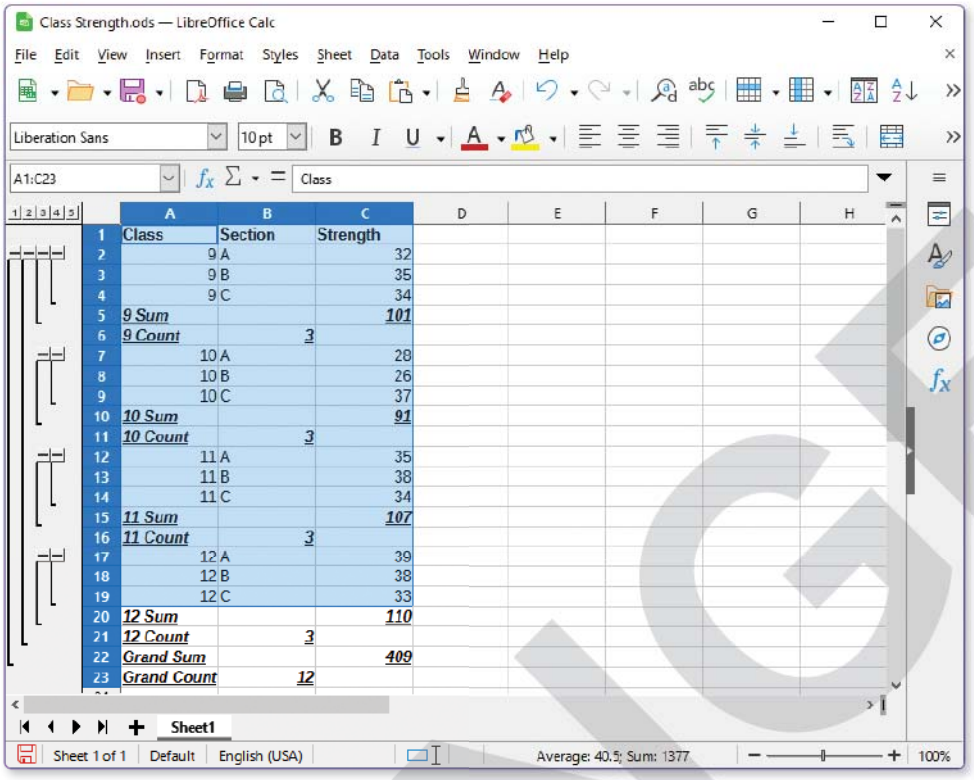
Step 8: Select **Strength** check box in the **Calculate subtotal for** list box.

Step 9: Select the **Sum** function from the **Use function** list box.

Step 10: Click on **OK** button.



Now, the data is grouped based on the Class and subtotal based on the section and Strength, as shown in below figure.



	A	B	C
1	Class	Section	Strength
2	9	A	32
3	9	B	35
4	9	C	34
5	9 Sum		101
6	9 Count	3	
7	10	A	28
8	10	B	26
9	10	C	37
10	10 Sum		91
11	10 Count	3	
12	11	A	35
13	11	B	38
14	11	C	34
15	11 Sum		107
16	11 Count	3	
17	12	A	39
18	12	B	38
19	12	C	33
20	12 Sum		110
21	12 Count	3	
22	Grand Sum		409
23	Grand Count	12	

When you use the subtotal tool, the outline is positioned to the left of the row numbers. This outline visually represents the hierarchical arrangement of data. You can expand or collapse different levels by clicking on the group indicators: the plus sign to expand and the minus sign to collapse. You can remove the outline from the sheet by selected the **Data → Group and Outline → Remove Outline** option from the menu bar.

USING WHAT IF SCENARIOS

A What-if scenario is a collection of values applicable for calculations in a spreadsheet. In LibreOffice Calc, multiple scenarios can create on a single sheet. Each scenario is assigned a name and a formatting style.

By defining different sets of values for variables within a model, users can explore how changes in these variables affect the outcomes or results of their calculations. What-if scenario is a powerful tool for decision-making, allowing users to compare various alternatives and optimise their plans based on different scenarios. It enable users to predict outcomes and make informed decisions.

After the scenarios are created, they can be edited and formatted independent of each other. You can easily switch between the scenarios using the drop-down list or Navigator and can create several scenarios for any given range of cells.

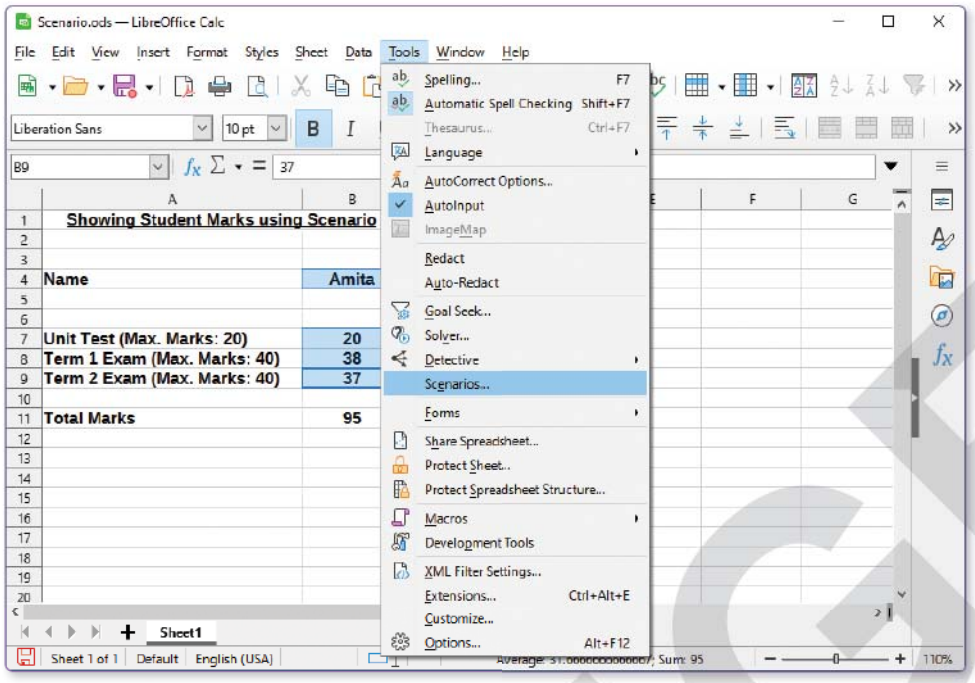
Let us take an example to create a scenario. We will create scenarios of students getting marks in different exams and calculate their total based on the set of cells created using different scenarios.

To do this, follow the given steps:

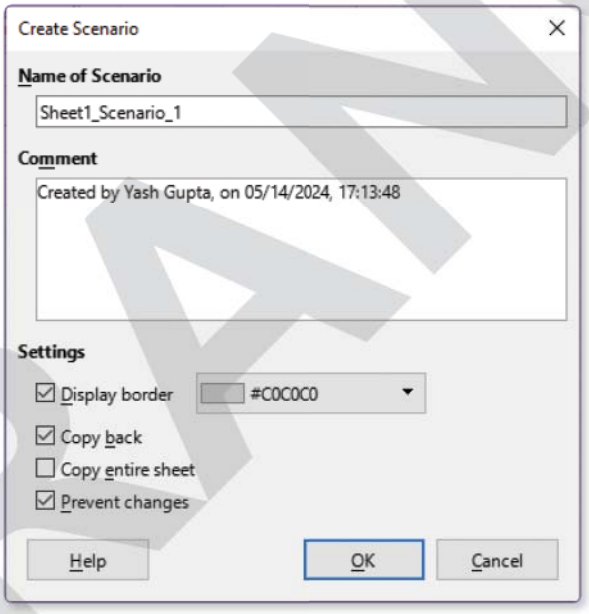
Step 1: Create a spreadsheet with marks of a student named Amita as shown below:

Step 2: Select cells C4, C7, C8, C9 to use in creating Scenarios. To select multiple cells, hold down the **Ctrl** key with each mouse click.

Step 3: Select the **Tools → Scenarios** option from the menu bar.



The **Create Scenario** dialog box will open.

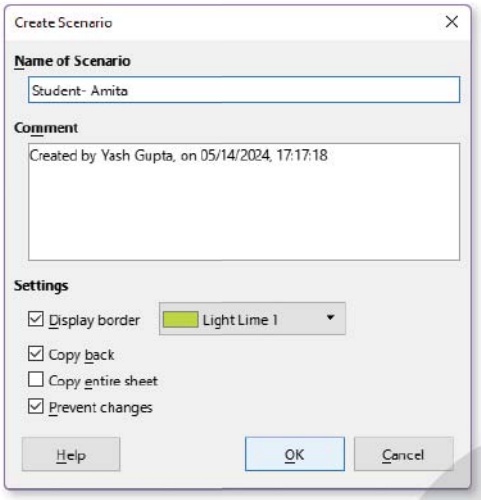


The options available in the window are:

- **Name of scenario:** Has the default name as Sheet1_Scenario_1. Change it to a relevant name that clearly identifies a scenario in the drop-down list and in the Navigator window.
- **Comment:** It is optional and is the extra information required. When you select the scenarios then this information is displayed in the Navigator.
- **Settings:** It has several options where the settings can be changed as per the situations:
  - **Display border:** It has a colour palette which gives you options to give different colours to different scenarios.
  - **Copy back:** The changes if you make in a scenario are copied back into the active scenario.
  - **Copy entire sheet:** The copy of the active scenario is displayed in a newly created permanent sheet.
  - **Prevent changes:** If the sheet is protected then it prevents the changes with the enabled **Copy back** option.

Step 4: Specify the scenario name and settings for the scenario.

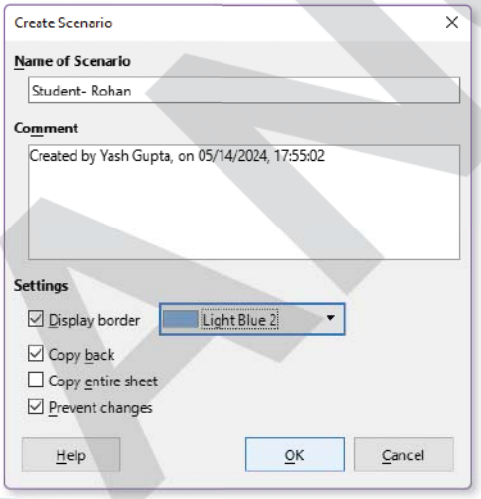
Step 5: Click on the **OK** button to create a scenario.



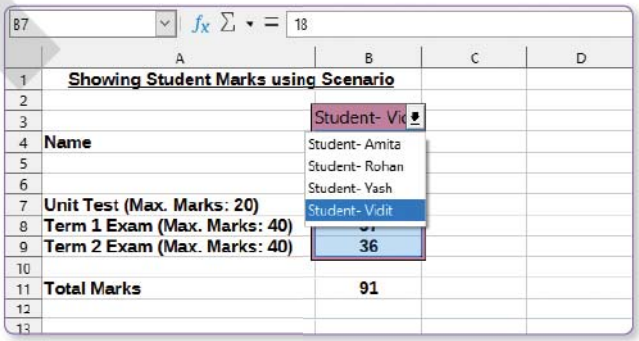
Step 6: Modify the spreadsheet with the new values for **Student – Rohan.**

Step 7: Select the **Tools → Scenarios** option from the menu bar. The **Create Scenario** dialog box will open.

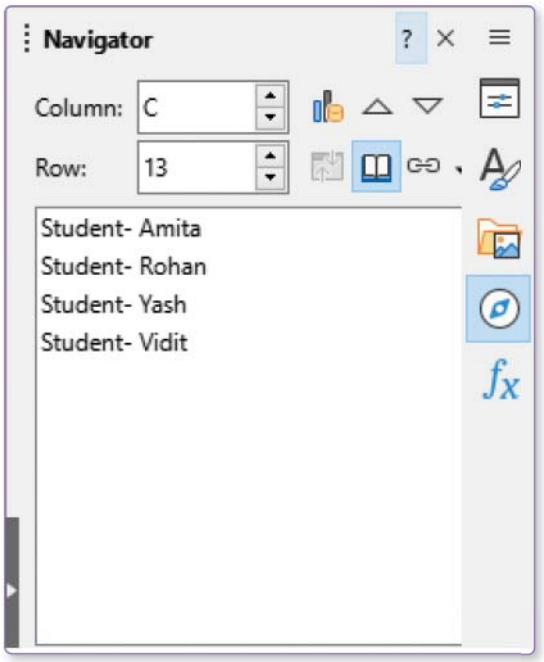
Step 8: Do the given changes in this **Create Scenario** dialog box and click on the **OK** button:



Step 9: Repeat the above steps to create two more scenarios. The spreadsheet will appear with the list of scenarios created if you click on the drop-down list of cell B4.



In the given example, we have created 4 scenarios of four students' marks. You can easily switch between these sets using a drop-down list which can be shown beside the changing cells or the selecting the **Scenarios** option in the **Navigator** pane, which is open by clicking the **Navigator** button in the **Sidebar** or by selecting the **View → Navigator** option in the menu bar.



SHORT KEY

To access the Navigator pane:

F5 + Alt + 4

If you click on each scenario the corresponding marks of the Unit Test, Term 1 Exam and Term 2 Exam changes and on that basis the Total Marks will be calculated and displayed. The set of four scenarios with the corresponding set of cells are displayed below:

	A	B	C
1	Showing Student Marks using Scenario		
2			
3		Student- An	
4	Name	Amita	
5			
6		Student- An	
7	Unit Test (Max. Marks: 20)	20	
8	Term 1 Exam (Max. Marks: 40)	38	
9	Term 2 Exam (Max. Marks: 40)	37	
10			
11	Total Marks	95	
12			
13			

	A	B	C
1	Showing Student Marks using Scenario		
2			
3		Student- Ro	
4	Name	Rohan	
5			
6		Student- Ro	
7	Unit Test (Max. Marks: 20)	19	
8	Term 1 Exam (Max. Marks: 40)	40	
9	Term 2 Exam (Max. Marks: 40)	39	
10			
11	Total Marks	98	
12			
13			

	A	B	C
1	Showing Student Marks using Scenario		
2			
3		Student- Ya	
4	Name	Yash	
5			
6		Student- Ya	
7	Unit Test (Max. Marks: 20)	18	
8	Term 1 Exam (Max. Marks: 40)	39	
9	Term 2 Exam (Max. Marks: 40)	38	
10			
11	Total Marks	95	
12			
13			

	A	B	C
1	Showing Student Marks using Scenario		
2			
3		Student- Vi	
4	Name	Vidit	
5			
6		Student- Vi	
7	Unit Test (Max. Marks: 20)	18	
8	Term 1 Exam (Max. Marks: 40)	37	
9	Term 2 Exam (Max. Marks: 40)	36	
10			
11	Total Marks	91	
12			
13			

USING WHAT IF ANALYSIS

What-If analysis involves exploring how changes in input variables affect the results of a formula or model. This analysis can be conducted with one input variable (one-input analysis) or two input variables (two-input analysis).

The description of each input is as follows:

- **One-Input What-If Analysis:** One-input What-If analysis allows you to examine how changes in a single input variable impact the outcome of a formula or calculation. You typically set up a column or row of cells containing different values for the input variable, and then observe how these changes affect the result of a formula elsewhere in the spreadsheet. For example, if you're analysing the impact of interest rates on loan payments, you might vary the interest rate across a range of values to see how it affects the monthly payment.
- **Two-Input What-If Analysis:** Two-input What-If analysis extends this concept to explore the effects of changes in two input variables on the outcome of a formula or calculation. You set up a grid of cells containing different combinations of values for the two input variables, and observe how changes in both variables simultaneously affect the result of the formula. For example, if you're analysing the impact of both interest rates and loan terms on monthly payments, you might vary both variables across a grid to see how different combinations affect the payment amount.

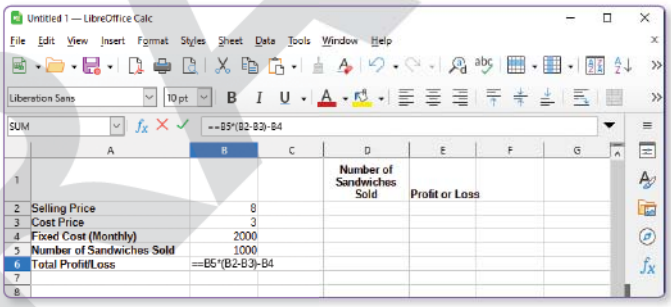
What-if tool uses **Data > Multiple Operations** and is a planning tool for what-if questions. The **Multiple Operations tool** creates a formula array to display the list of results applying the formula on a list of alternative values used in the formula. This tool uses two arrays of cells, one array contains the input values and the second array uses the formula and display the result. This What-if analysis tool is very helpful when we want to know how much profit we earn for a particular product for a series of selling units.

Let us take an example to conduct an analysis with one input variable. Suppose you run a café where you sell sandwiches for ₹8 each. It costs you ₹3 to make each sandwich. On top of that, you have fixed monthly expenses of ₹2000. How would your monthly profit or loss be affected by the number of sandwiches sold?

To conduct an analysis with one input variable, perform the following steps:

Step 1: Enter data in a sheet that is used to calculate the monthly profit or loss be affected by the number of sandwiches sold.

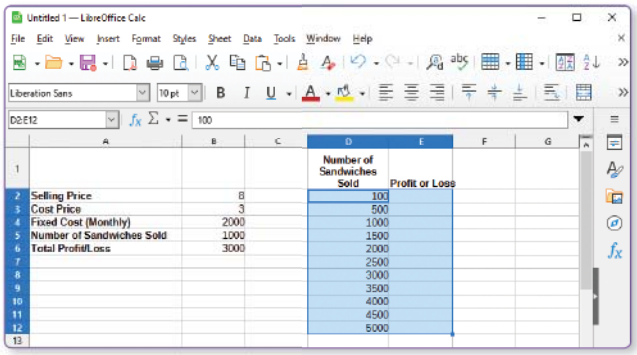
Step 2: Click on the cell **B6** and type the **=B5*(B2-B3)-B4** formula to calculate the profit or loss.



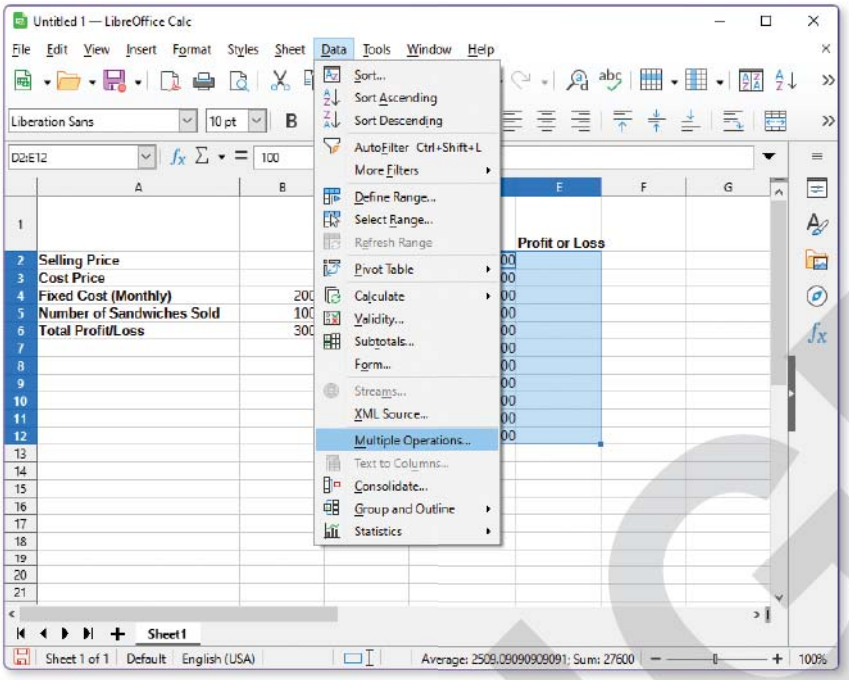
Step 3: Press the **Enter** key. The output of the formula is displayed in cell **B6**.

Step 4: Enter input values on the basis of which the output is to be generated using the formula.

Step 5: Select the cell range for input values and output values.



Step 6: Select the **Data → Multiple Operations** option from the menu bar.

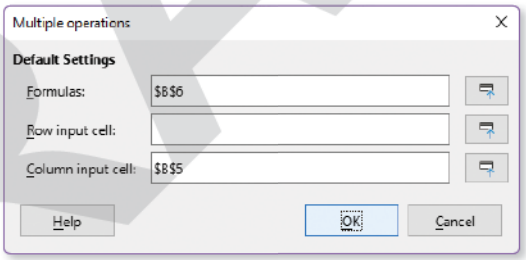


The **Multiple operations** dialog box opens.

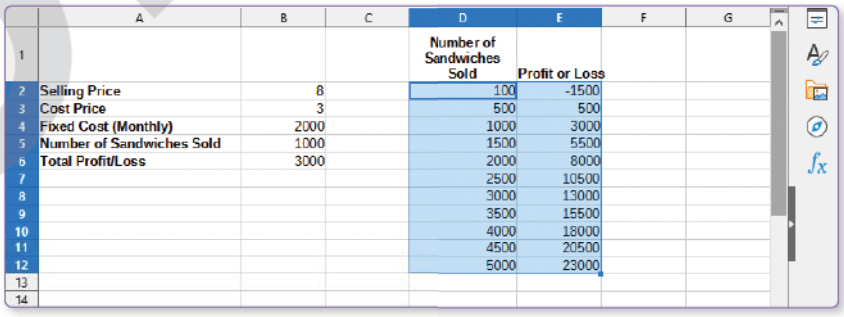
Step 7: Click in the **Formulas** text box and select the cell in the sheet that contains the formula. The address of the cell is displayed in the **Formulas** text box.

Step 8: Click in the **Column input cell** text box and select the cell in the sheet which is a variable and is used in the formula based on which the output is measures. The address of the cell is displayed in the **Column input cell** text box.

Step 9: Click on the **OK** button.



Now, the profit or loss value for the output array range automatically fills according to the input value.



Let us take an example to conduct an analysis with two input variables. Suppose you run a café where you sell sandwiches for ₹8 each. It costs you ₹3 to make each sandwich. On top of that, you have fixed monthly expenses of ₹2000. How would your monthly profit or loss be affected by the number of sandwiches sold and the cost price?

To conduct an analysis with one input variable, perform the following steps:

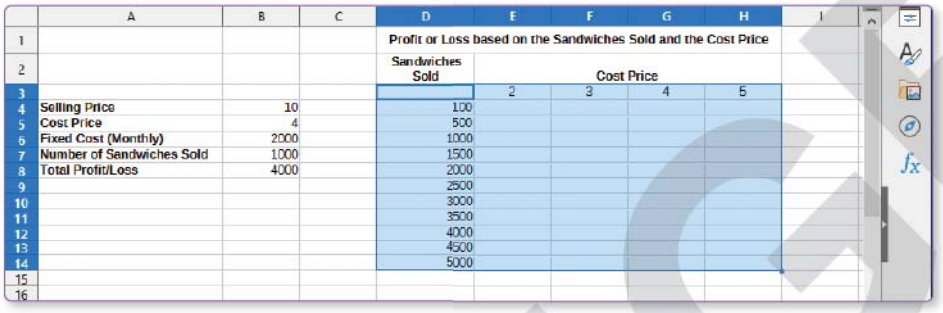
Step 1: Enter data in a sheet that is used to calculate the monthly profit or loss be affected by the number of sandwiches sold.

Step 2: Click on the cell **B6** and type the **=B7*(B4-B5)-B6** formula to calculate the profit or loss.

Step 3: Press the **Enter** key. The output of the formula is displayed in cell **B6**.

Step 4: Enter input values for rows and columns on the basis of which the output is to be generated using the formula.

Step 5: Select the cell range for input values and output values.



	A	B	C	D	E	F	G	H	I
1				Profit or Loss based on the Sandwiches Sold and the Cost Price					
2				Sandwiches Sold	Cost Price				
3					2	3	4	5	
4	Selling Price	10		100					
5	Cost Price	4		500					
6	Fixed Cost (Monthly)	2000		1000					
7	Number of Sandwiches Sold	1000		1500					
8	Total Profit/Loss	4000		2000					
9				2500					
10				3000					
11				3500					
12				4000					
13				4500					
14				5000					
15									
16									

Step 6: Select the **Data → Multiple Operations** option from the menu bar.

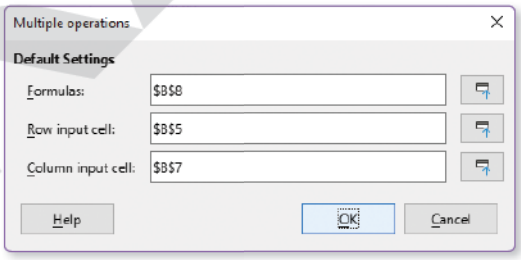
The **Multiple operations** dialog box opens.

Step 7: Click in the **Formulas** text box and select the cell in the sheet that contains the formula. The address of the cell is displayed in the **Formulas** text box.

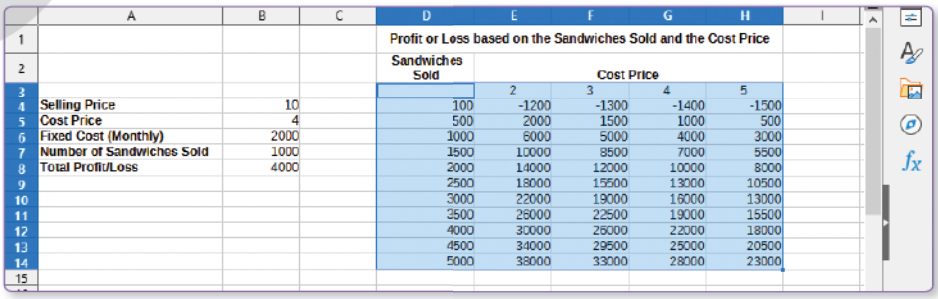
Step 8: Click in the **Row input cell** text box and select the cell in the sheet which is a variable for row inputs and is used in the formula based on which the output is measures. The address of the cell is displayed in the **Column input cell** text box.

Step 9: Click in the **Column input cell** text box and select the cell in the sheet which is a variable for column inputs and is used in the formula based on which the output is measures. The address of the cell is displayed in the **Column input cell** text box.

Step 10: Click on the **OK** button.



Now, the profit or loss value for the output array range automatically fills according to the input values.



	A	B	C	D	E	F	G	H	I
1				Profit or Loss based on the Sandwiches Sold and the Cost Price					
2				Sandwiches Sold	Cost Price				
3					2	3	4	5	
4	Selling Price	10		100	-1200	-1300	-1400	-1500	
5	Cost Price	4		500	2000	1500	1000	500	
6	Fixed Cost (Monthly)	2000		1000	6000	5000	4000	3000	
7	Number of Sandwiches Sold	1000		1500	10000	8500	7000	5500	
8	Total Profit/Loss	4000		2000	14000	12000	10000	8000	
9				2500	18000	15500	13000	10500	
10				3000	22000	19000	16000	13000	
11				3500	26000	22500	19000	15500	
12				4000	30000	26000	22000	18000	
13				4500	34000	29500	25000	20500	
14				5000	38000	33000	28000	23000	
15									

USING GOAL SEEK

Goal Seek is a tool used to find the input value required to achieve a desired outcome in a formula. It allows you to set a target value for a cell and then adjust the value of another cell until the target value is achieved. The Goal Seek tool is useful for financial modelling, planning, and optimisation tasks where you need to determine the input required to achieve a specific outcome.

Let's use an example to illustrate the concept of Goal Seek. Imagine you operate a small bakery where you sell 50 pastries for ₹20 each. It costs you ₹8 to make each pastry. Additionally, you have fixed monthly expenses of ₹1500. Currently, the bakery is experiencing a loss. Now, let's calculate how many pastries you need to sell each month to cover your fixed costs and achieve a profit of at least ₹1500.

To use Goal Seek tool, perform the following steps:

Step 1: Enter data in a sheet that is used to calculate the total revenue, total cost, and profit or loss.

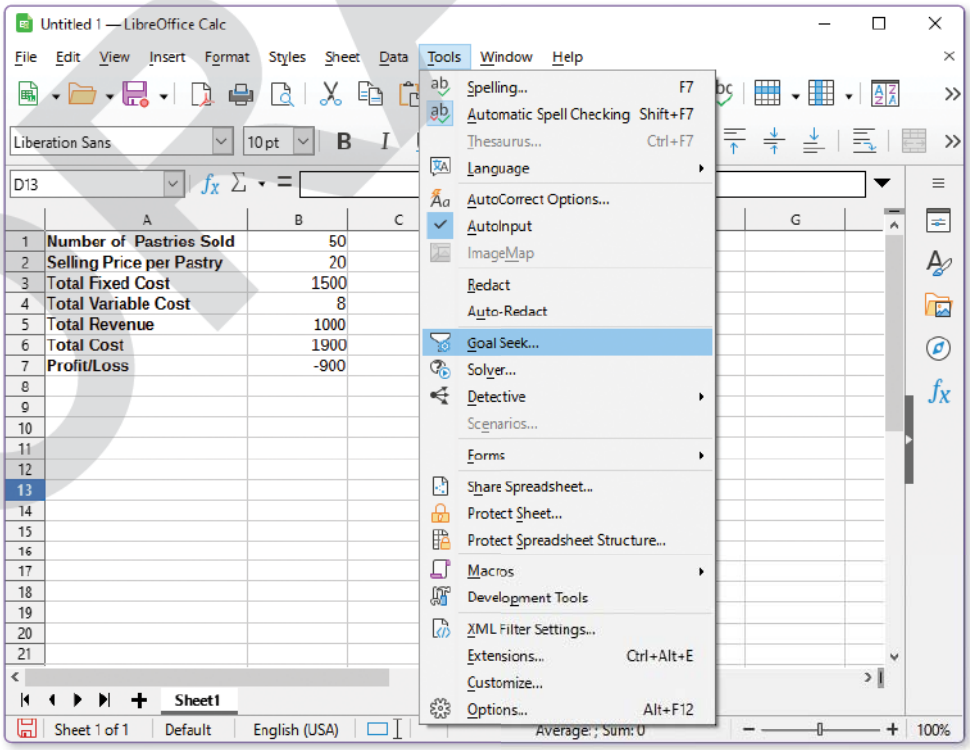
	A	B	C	D
1	**Number of Pastries Sold**	50		
2	**Selling Price per Pastry**	20		
3	**Total Fixed Cost**	1500		
4	**Total Variable Cost**	8		
5	**Total Revenue**			
6	**Total Cost**			
7	**Profit/Loss**			
8				
9				
10				

Step 2: Type the **=B1*B2** formula in cell **B5** to calculate total revenue and press **Enter** key.

Step 3: Type the **=B3+(B1*B4)** formula in cell **B6** to calculate total cost and press **Enter** key.

Step 4: Type the **=B5-B6** formula in cell **B7** to calculate profit or loss and press **Enter** key.

Step 5: Select the **Tools → Goal Seek** option from the menu bar.



The **Goal Seek** dialog box opens containing following three options:

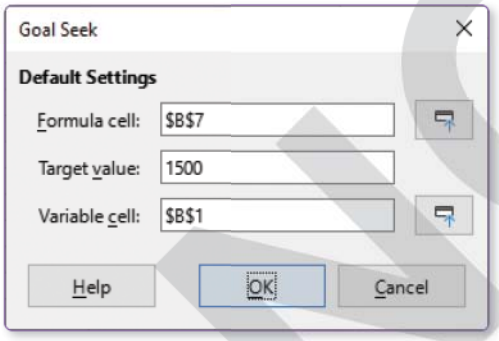
- **Formula cell:** In the Formula cell, we can enter the reference of the cell which contains the formula. It contains the current cell reference. We can click another cell in the sheet to apply its reference to the text box.
- **Target value:** It specifies the value you want to achieve as a new result.
- **Variable cell:** It specifies the reference for the cell that contains the value you want to adjust in order to reach the target.

Step 6: Click in the **Formulas** text box and select the cell in the sheet that contains the formula. The address of the cell is displayed in the **Formulas** text box.

Step 7: Click in the **Target value** text box and type the target value in it (1500).

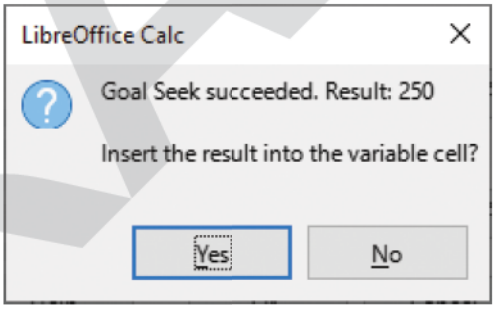
Step 8: Click in the **Variable cell** text box and select the cell that contains the value you want to adjust in order to achieve the target value. The address of the cell is displayed in the **Variable cell** text box.

Step 9: Click on **OK** button.



The **LibreOffice Calc** message box appears that show the message **Goal Seek was successful**.

Step 10: Click on **Yes** to change the cell B1 with the new value predicted 250 that will make the profit 1500 for the month.



The spreadsheet with the new changes with the predicted value (number of pastries to sell) to get the desired profit is shown below:

	A	B	C	D
1	**Number of Pastries Sold**	250		
2	**Selling Price per Pastry**	20		
3	**Total Fixed Cost**	1500		
4	**Total Variable Cost**	8		
5	**Total Revenue**	5000		
6	**Total Cost**	3500		
7	**Profit/Loss**	1500		
8				
9				
10				

USING SOLVER

Solver is another What-if Analysis Tool of LibreOffice Calc. It is the next advanced form of Goal Seek. In case of Goal Seek you get the desired result by changing one variable whereas in case of Solver you get the desired result by changing the multiple variables. It helps you find out the best possible combinations of the multiple variable values for the maximum or minimum desired result. It works on rules applicable for different variables used in the formula:

- The variables in the formula should be greater than, less than or equal to the desired value entered in Solver.
- If you do not want the variable to change then the value of the variable should be equal to the desired value entered in Solver.
- If you want the variable to change then you can set the rule that the variable cannot be either bigger than another value or bigger than the desired value entered in the Solver.

Let us take an example to understand the concept of solver. Suppose, the unit test marks of each subject of Devesh, a student of Class 10, are:

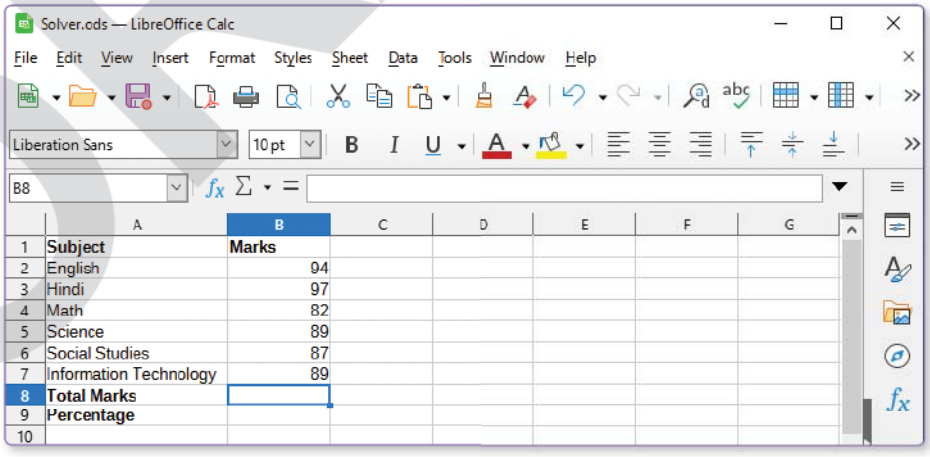
Subject	Marks
English	94
Hindi	97
Maths	82
Science	89
Social Studies	87
Information Technology	89

Now, we want to calculate Devesh's percentage marks using Solver with the following criteria:

- Math marks is greater than or equal to 95
- Science marks is less than or equal to 90
- Social Studies marks is less than or equal to 87
- Information Technology marks is less than or equal to 95

To use solver, perform the following steps:

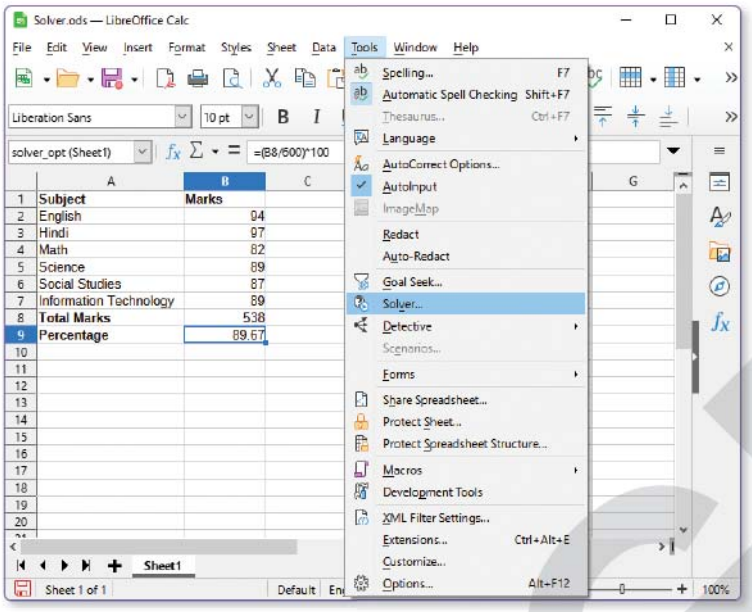
Step 1: Enter data in a sheet that is used to calculate the total marks and percentage.



Step 2: Type the **=SUM(B2:B7)** formula in cell **B8** to calculate total marks and press **Enter** key.

Step 3: Type the **=(B8/600)*100** formula in cell **B9** to calculate percentage and press **Enter** key.

Step 4: Select the **Tools → Solver** option from the menu bar.



The **Solver** dialog box open.

Step 5: Change the values in the **Solver** dialog box as given below:

Target cell: $B$9

Optimise result to: Value - 94

By changing cells: $B$4:$B$7

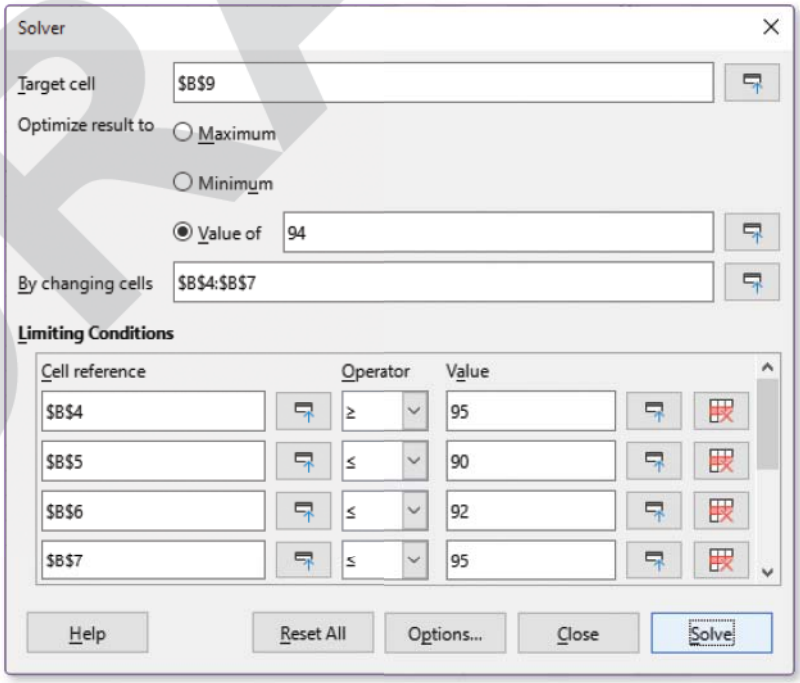
Cell reference: $B$4 >= 95

$B$5 <= 90

$B$6 <= 92

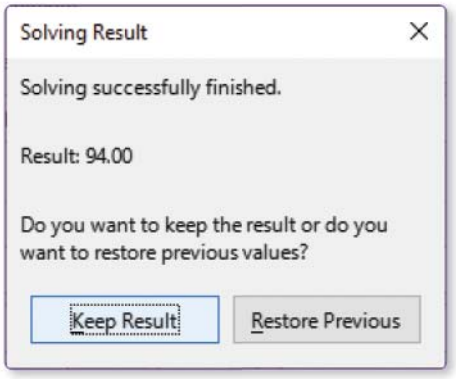
$B$7 <= 95

Step 6: Click on **Solve** button.



The **Solving Result** dialog box will be displayed.

Step 7: Click on **Keep Result** button to keep the change in the sheet.



This will change the values of the cells to get the desired 94%. The spreadsheet after the changes will appear as follows:

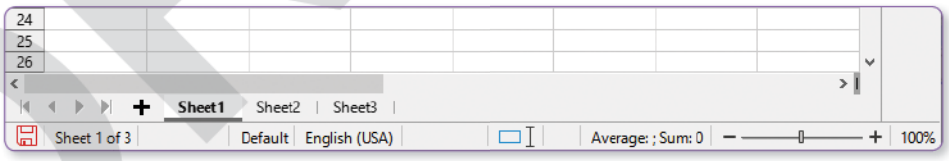
	A	B	C	D
1	**Subject**	**Marks**		
2	English	94		
3	Hindi	97		
4	Math	96		
5	Science	90		
6	Social Studies	92		
7	Information Technology	95		
8	**Total Marks**	564		
9	**Percentage**	94.00		
10				
11				

LINKING DATA AND SHEET

Linking the sheets is done to access data present in the different sheets of the same spreadsheet or in different spreadsheets. This data is needed for calculation and data analysis. LibreOffice Calc gives you the facility of using data from multiple sheets at the same time.

Setting up Multiple Sheets

When you open a new spreadsheet, it has a single sheet named as Sheet1, by default. LibreOffice Calc allows you to add and remove sheet in the spreadsheet according to the requirement. These sheets are managed in the Sheet tab located at the bottom of the spreadsheet.



Inserting a New Sheet

There are several ways by which you can add a new sheet in the spreadsheet. To insert a sheet, perform the following steps:

Step 1: Select a sheet where you want the sheet to be inserted after it or before it.

Step 2: Click on **Sheet** menu and select Insert **Sheet** option from the menu bar.

OR

Right-click on the empty area in the **Sheet** tab and select **Insert Sheet** option from the context menu.

OR

Click the **Add new sheet** button in the **Sheet** tab.

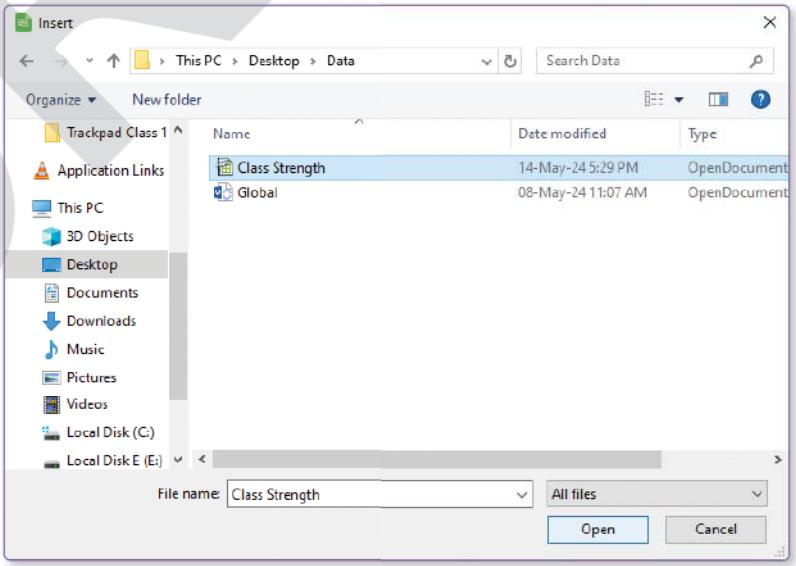
PURE FACT

When you add a new sheet by clicking the Add new sheet button in the Sheet tab, then the new sheet will be inserted at the end of the existing sheets in the Sheet tab.

The **Insert Sheet** dialog box opens.

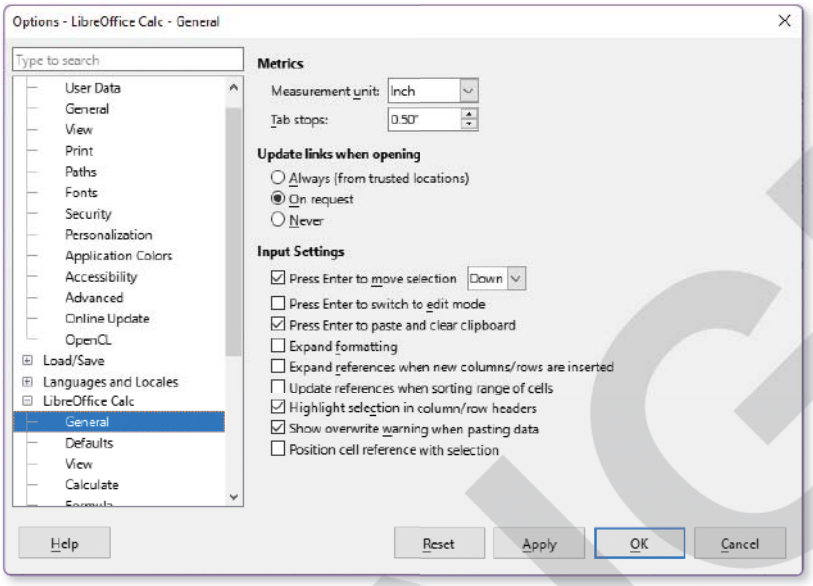
The **Insert Sheet** dialog box contains the following options:

- **Position:** This option is used to specify the position of the sheet to be inserted. It provides two options Before current sheet and after current sheet.
- **New Sheet:** This option is used to add new sheet.
- **No of sheets:** By default, 1 sheet is added but if you want the more than one sheet to be inserted then increase the number in **No of sheets** text box.
- **Name:** This option allows you to provide descriptive names to the sheet that reflect the content or purpose it.
- **From File:** This option is used if you want the sheet to be inserted from another file. For this, click on the **Browse** button and then select the file from the **Insert** dialog box and click the **Open** button.



The selected file adds in the **From file** list box.

- **Link:** If this option is selected then the sheet taken from some other file into the current sheet is linked instead of copy which means any changes done in the original sheet will be reflected in the current sheet. The links can be updated manually to show the current contents of the external file or depending on the options you have selected in **Tools → Options → LibreOffice Calc → General → Updating links when opening** options.



Renaming a Sheet

You can rename a default name or existing name of the sheet at any time. To do this, perform the following steps:

Step 1: Double-click the sheet in the **Sheet** tab.

OR

Right-click on the sheet in the **Sheet** tab and select the **Rename Sheet** option from the context menu.

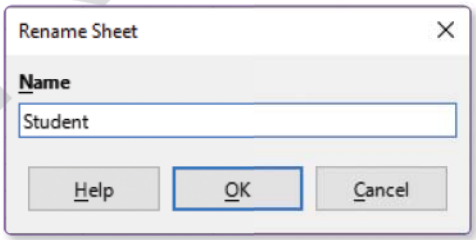
OR

Select the sheet in the **Sheet** tab and then select the **Sheet → Rename Sheet** option from the menu bar.

The **Rename** dialog box opens.

Step 2: Delete the old name and type a new name of your choice in the **Name** text box.

Step 3: Click on **OK** button.



Deleting an Existing Sheet

If you want to delete an existing sheet, then follow the given steps:

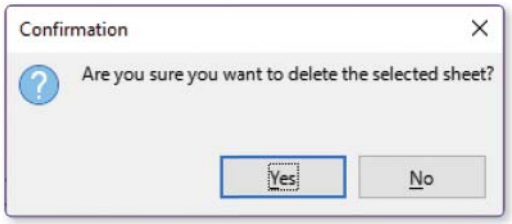
Step 1: Right-click the sheet on the **Sheet** tab and select the **Delete Sheet** option from the content menu.

OR

Select the sheet in the **Sheet** tab and then select the **Sheet → Delete Sheet** option from the menu bar.

The **Confirmation** message box appears.

Step 2: Click the **Yes** button to confirm the deletion of sheet.



Cell References

Cell reference is a very important feature of any spreadsheet program. A cell reference is the method used to refer to a cell or a range of cells within a spreadsheet. Cell references consist of a column letter followed by a row number (e.g., A1, B2, C3, etc.). Cell reference of a range of cells is starting cell address and ending cell address separated by colon(:) in between. For example, C10:C20, A1:B6 and C5:D10.

The main advantage of using cell reference is that it can be used in formulas and functions. This helps you update the result of a function or a formula automatically if the value in a particular cell used in a formula changes. Also if a function or a formula is either copied or moved then the cell address in the formula/function is automatically updated with respect to the location it is copied or moved.

In LibreOffice Calc, you can use cell references to refer to data in various ways:

- Contiguous cells on the same sheet
- Non-contiguous cells on the same sheet
- Data on other sheets in the same spreadsheet
- Data on sheets of the other spreadsheet

Adding a Cell Reference within a Spreadsheet

You can add a cell reference between sheets within a spreadsheet by referencing the sheet name and the cell reference separated by dot(.) operator in between. For example, if you want to reference cell A1 in Sheet2 from Sheet1, you would enter "=$Sheet2.A1" in the desired cell of Sheet1, then press Enter to display the value from cell A1 of Sheet2.

Using a Mouse

You can add cell reference between sheets within a spreadsheet using mouse by performing the following steps:

Step 1: Create a spreadsheet with the name **Sales** with the four sheets named as - **Jan**, **Feb**, **Mar**, and **Quarterly Sales** having the following details:

Sheet: Jan

	A	B	C
1	**Product-wise Sales of Jan Month**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop	12	
4	Monitor	8	
5	Scanner	4	
6			

Sheet: Feb

	A	B	C
1	**Product-wise Sales of Feb Month**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop	10	
4	Monitor	7	
5	Scanner	2	
6			

Sheet: Mar

	A	B	C
1	**Product-wise Sales of Mar Month**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop	15	
4	Monitor	8	
5	Scanner	3	
6			

Sheet: Quarterly Sales

	A	B	C
1	**Product-wise Quarterly Sales**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop		
4	Monitor		
5	Scanner		
6			

In Quarterly Sales sheet, we need to add the total sales of a product in a quarter by adding the total sales of a product in the month of January, February, and March.

Step 2: Click on cell **B3** and place an "=" sign in **Quarterly Sales** sheet.

Step 3: Click on the **Jan** sheet in the **Sheet** tab and click on cell **B3**.

Step 4: Again, click on the **Quarterly Sales** sheet in the **Sheet** tab. You will see the cell reference as shown below.

Step 5: Type the + sign.

	A	B	C
1	**Product-wise Quarterly Sales**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop	=$Jan.B3+	
4	Monitor		
5	Scanner		
6			
7			

Step 6: Similarly, add sheet references of **Feb** and **Mar** sheets. Now the cell reference in the formula given in **Quarterly Sales** sheet will be:

	A	B	C
1	**Product-wise Quarterly Sales**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop	=$Jan.B3+$Feb.B3+$Mar.B3	
4	Monitor		
5	Scanner		
6			
7			

Step 7: Press the **Enter** key to see the total quarterly sales i.e. 37, as shown below:

	A	B	C
1	**Product-wise Quarterly Sales**		
2	**Product**	**Sales (in Lakhs)**	
3	Laptop	37	
4	Monitor		
5	Scanner		
6			
7			

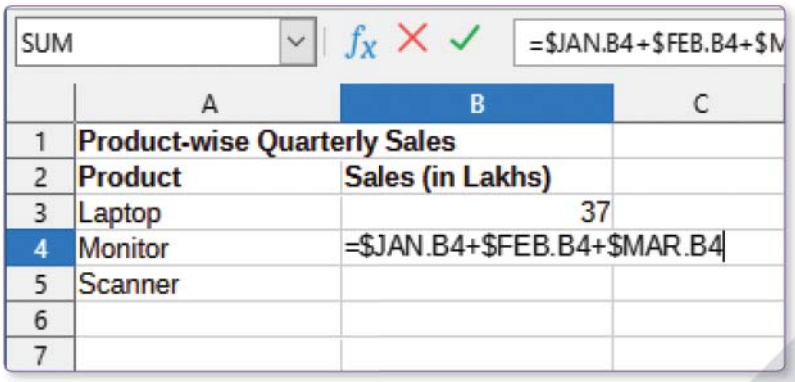
Using a Keyboard

Now, let us do the same concept using a keyboard. Whenever we are using a keyboard to give cell reference then there is no need to switch between the Sheet tab. Just place your cursor in the required cell and type the formula containing the cell reference.

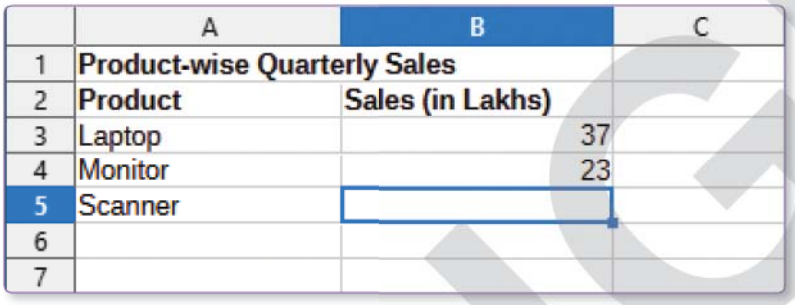
Let us take the example of the above sheet where we are calculating the quarterly sales or products. We already calculated the total quarterly sales of the laptop using mouse. Now, we will calculate the total quarterly sales of the laptop using keyboard by following the given steps:

Step 1: Click on cell **B4** in the **Quarterly Sales** sheet in the **Sheet** tab.

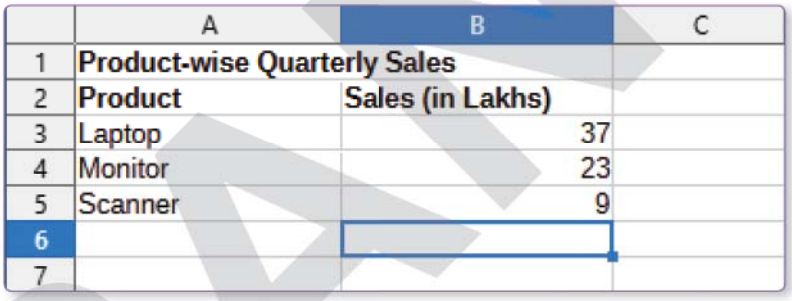
Step 2: Type the following formula **=$JAN.B5+$FEB.B5+$MAR.B5**.



Step 3: Press the **Enter** key to see the total quarterly sales of Monitor i.e. 23, as shown below:



Step 4: Similarly, calculate the total quarterly sales of Scanner i.e. 23, as shown below:



Note that if the sheet name is made up of two or more words then single quotes are used to enclose sheet name in cell reference . For example if sheet name is Jan 2024 then cell reference will change to $'JAN 2024'.B4

INFO MAIL

Subject: To create reference to an individual cell Syntax:

$Sheet_name.Cell_address

INFO MAIL

Subject: To create reference to a Range of Cells

Syntax: Sheet_name.First_cell:Last_cell

Example: To refer to cells A1:A10 in Sheet2, type '$Sheet2.A1:A10'

Adding a Cell Reference Outside the Document

Referencing a sheet outside of the document allows you to consolidate and analyse data from different sources without manually copying it. In this references, linked data may not update automatically if the source spreadsheet is closed or if there are changes in the file paths. You might need to manually update links or refresh data.

Using a Mouse

You can add cell reference between sheets outside the document using mouse by performing the following steps:

Step 1: Create a spreadsheet with the name **Branch Inventory** with the three sheets named as - **Meerut**, **Delhi**, and **Lucknow** having the following details:

Sheet: Meerut

	A	B	C
1	**Inventory at Meerut Branch**		
2	**Product**	**Total Inventory**	
3	Shampoo	15000	
4	Hair Oil	2600	
5	Scrub	3500	
6			
7			

Sheet: Delhi

	A	B	C
1	**Inventory at Delhi Branch**		
2	**Product**	**Total Inventory**	
3	Shampoo	9800	
4	Hair Oil	5750	
5	Scrub	3800	
6			
7			

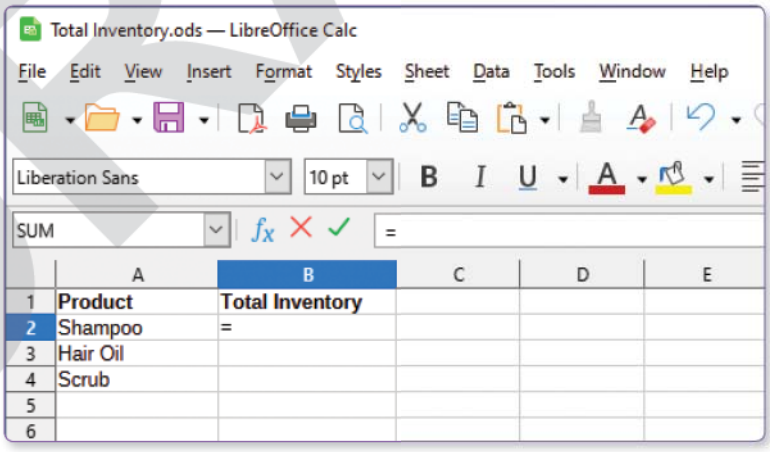
Sheet: Lucknow

	A	B	C
1	**Inventory at Lucknow Branch**		
2	**Product**	**Total Inventory**	
3	Shampoo	7500	
4	Hair Oil	8500	
5	Scrub	4800	
6			
7			

Step 2: Create a spreadsheet with the name **Total Inventory.**

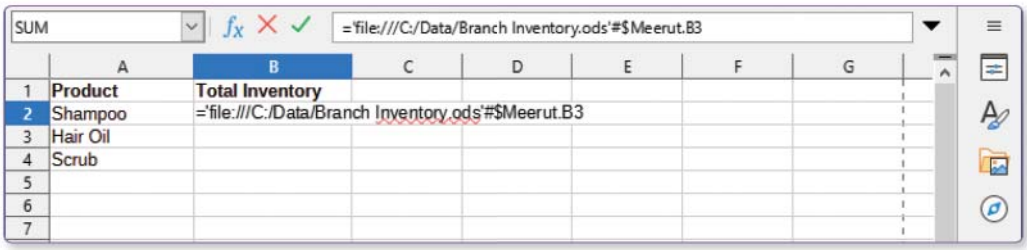
In **Total Inventory** spreadsheet, we need to calculate the total inventory of a product of **Meerut**, **Delhi**, and **Lucknow** branches.

Step 3: Click on cell **B2** and place an "=" sign in **Sheet 1** of the **Total Inventory** spreadsheet.



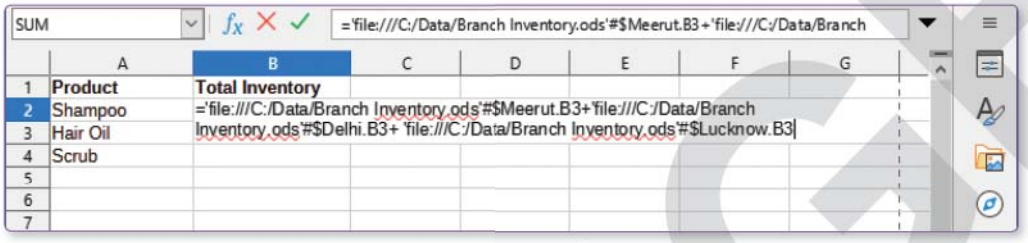
Step 4: Click on the **Meerut** sheet in the **Sheet** tab of the **Branch Inventory** spreadsheet and click on cell **B3**.

Step 5: Again, click on the **Sheet 1** sheet in the **Sheet** tab of the **Total Inventory** spreadsheet. You will see the cell reference as shown below.

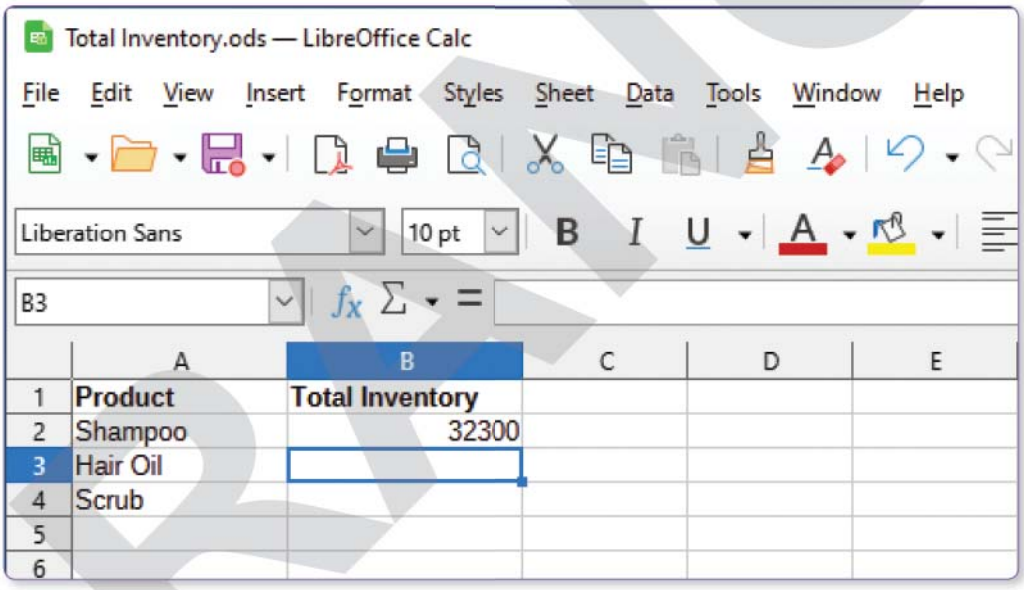


Step 6: Type the + sign.

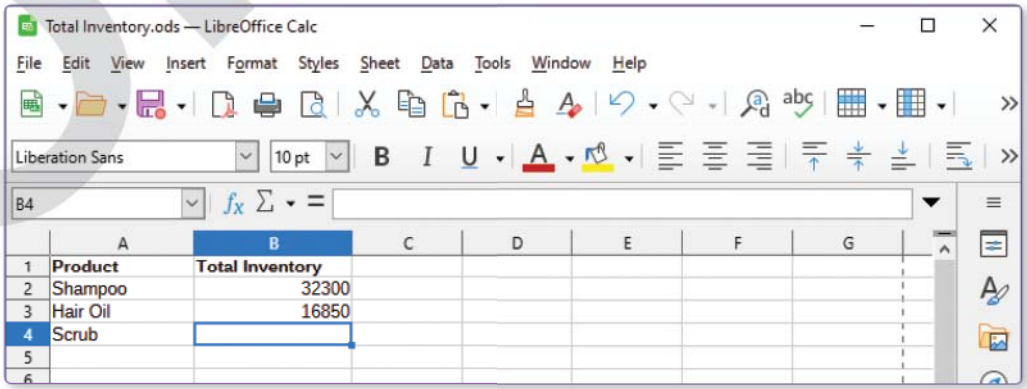
Step 7: Similarly, add sheet references of **Delhi** and **Lucknow** sheets of the **Branch Inventory** spreadsheet. Now the cell reference in the formula given in **Total Inventory** spreadsheet will be:



Step 8: Press the **Enter** key to see the total inventory, i.e. 32300, as shown below:



Step 9: Similarly, calculate the total inventory of hair oil i.e. 23, as shown below:



Using a Keyboard

When referencing a cell in another spreadsheet, we enclose the file path in single quotes, followed by '#$', then the sheet name, a period, and finally, the cell address.

For example, 'file:///C:/Data/Branch Inventory.ods'#$Meerut.B3

So we see that the cell reference has three parts to it:

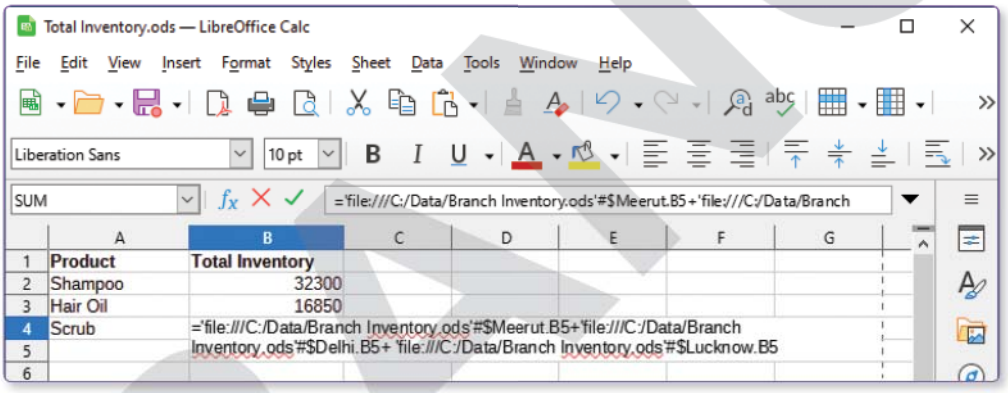
- Path and file name
- Sheet name
- Cell reference

Note that: The file path uses three forward slashes ('///') and if the filename contains spaces, it should be enclosed in single quotes. Additionally, it's feasible to import a sheet from a different file using the "From file" option in the Insert Sheet dialog box.

You can add cell reference between sheets outside the document using keyboard by performing the following steps:

Step 1: Click on cell **B4** in the **Sheet 1** sheet in the **Sheet** tab of the **Total Inventory** spreadsheet.

Step 2: Type the following formula **='file:///C:/Data/Branch Inventory.ods'#$Meerut.B5+'file:///C:/Data/Branch** Inventory.ods'#$Delhi.B5+ 'file:///C:/Data/Branch Inventory.ods'#$Lucknow.B5.



Step 3: Press the **Enter** key to see the total inventory sales of Scrub i.e. 12100, as shown below:

	A	B	C	D
1	**Product**	**Total Inventory**		
2	Shampoo	32300		
3	Hair Oil	16850		
4	Scrub	12100		
5				
6				
7				

Working with Hyperlinks

In LibreOffice Calc, a hyperlink is a feature that allows you to jump to a different location from within a spreadsheet. When users click on the hyperlink, Calc will navigate to the specified destination, whether it's another location within the spreadsheet, a file on the computer, or a website on the internet.

Hyperlinks in Calc can be edited or removed by selecting the cell containing the hyperlink and then using the appropriate options by using the context menu.

Hyperlinks helps you to:

- Move to a specific cell within the current spreadsheet.
- Move to a specific location in another file. This file can be a spreadsheet, document, or any other file.
- Accessing a specific website.
- Sending an email to a specific address.
- Creating a new file.

Hyperlink in a spreadsheet is of two types which are as follows:

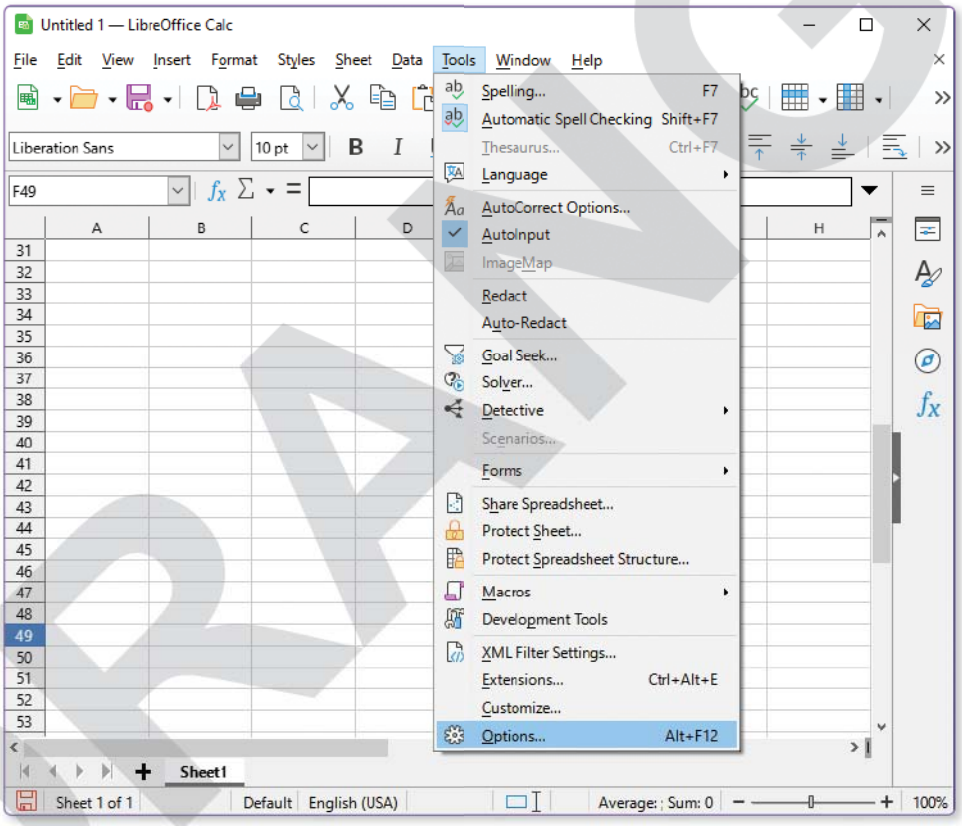
- Relative Hyperlink
- Absolute Hyperlink

Relative Hyperlink

It refers to reaching the linked document with respect to the current location. It will include the partial cell address in hyperlink. If the start and target locations change relative to each other, then relative hyperlink will not work.

To make it work, follow the given steps:

Step 1: Select the **Tools → Options** option in the menu bar.



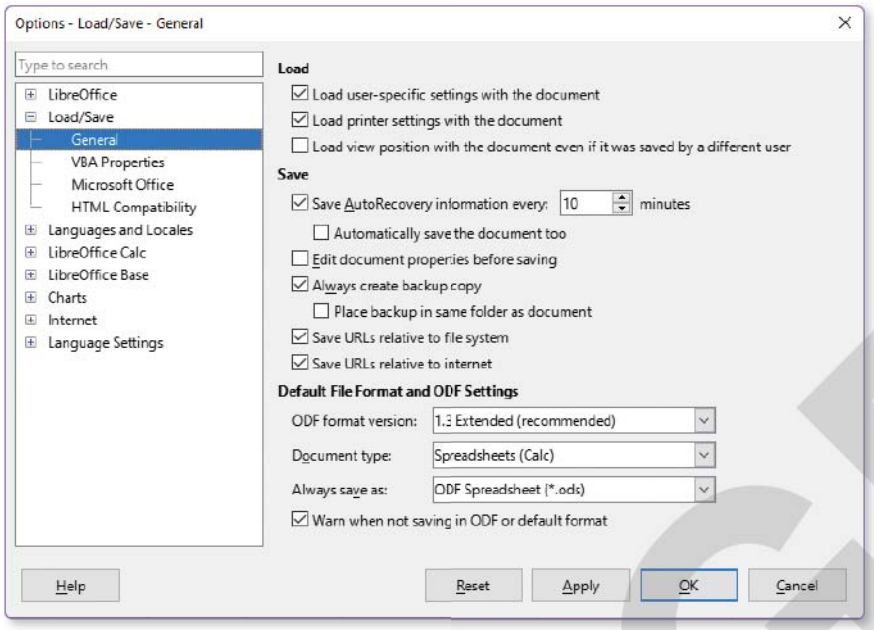
The **Options** dialog box will open.

Step 2: Click on the **Load/Save** category. The **Load/Save** category expands and displays the options.

Step 3: Select the **General** option. The general options related to Calc displays on the right-side of the **Options** dialog box.

Step 4: Select the **Save URLs relative to file system** and **Save URLs relative to internet** check boxes if you want URLs saved relatively when referencing the File System, the Internet, or both.

Step 5: Click the **OK** button.



Absolute Hyperlink

It refers to reaching to the linked file by writing the complete address starting from the root directory. If the target location is changed then the absolute hyperlink will stop working.

To make it work, follow the given steps:

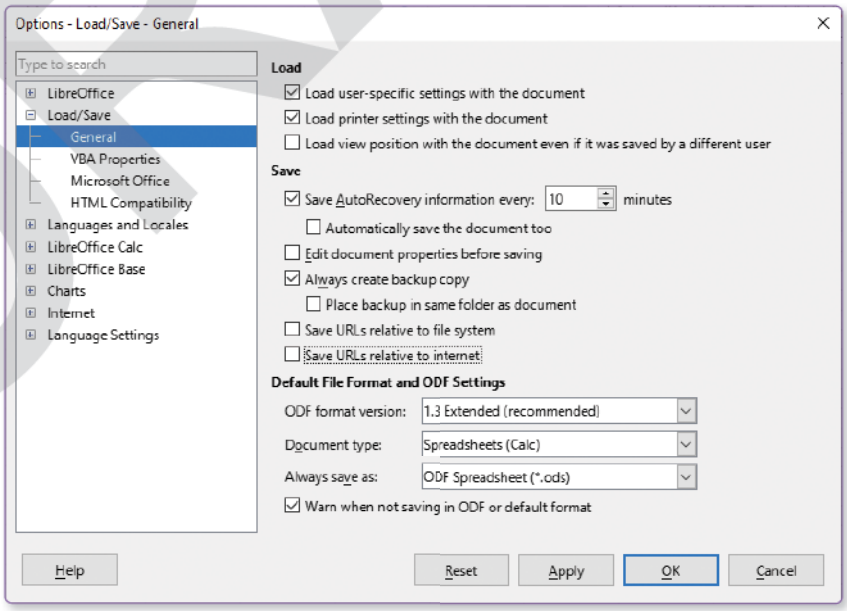
Step 1: Select the **Tools → Options** option in the menu bar. The **Options** dialog box will open.

Step 2: Click on the **Load/Save** category. The **Load/Save** category expands and displays the options.

Step 3: Select the **General** option. The general options related to Calc displays on the right-side of the **Options** dialog box.

Step 4: Deselect the **Save URLs relative to file system** and **Save URLs relative to internet** check boxes if you want the absolute hyperlink.

Step 5: Click the **OK** button.



PURE FACT

In LibreOffice Calc, each sheet can have a maximum of 1,048,576 rows and a maximum of 16384 columns.

Creating a Hyperlink

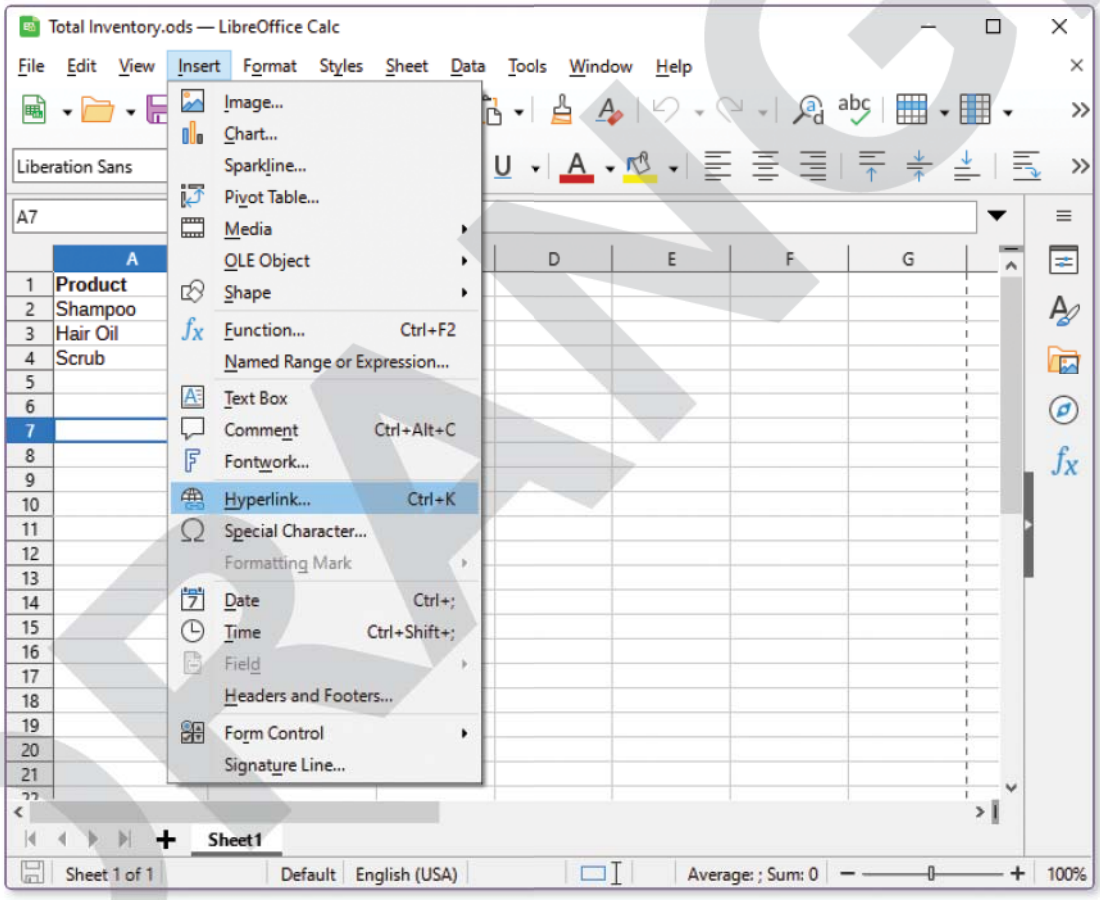
To create a hyperlink, steps are as follows:

Step 1: Select the cell in a spreadsheet in which you want to create hyperlink. If there is already some text, then select the text.

Step 2: Click on **Hyperlink** icon on the **Standard** toolbar.

OR

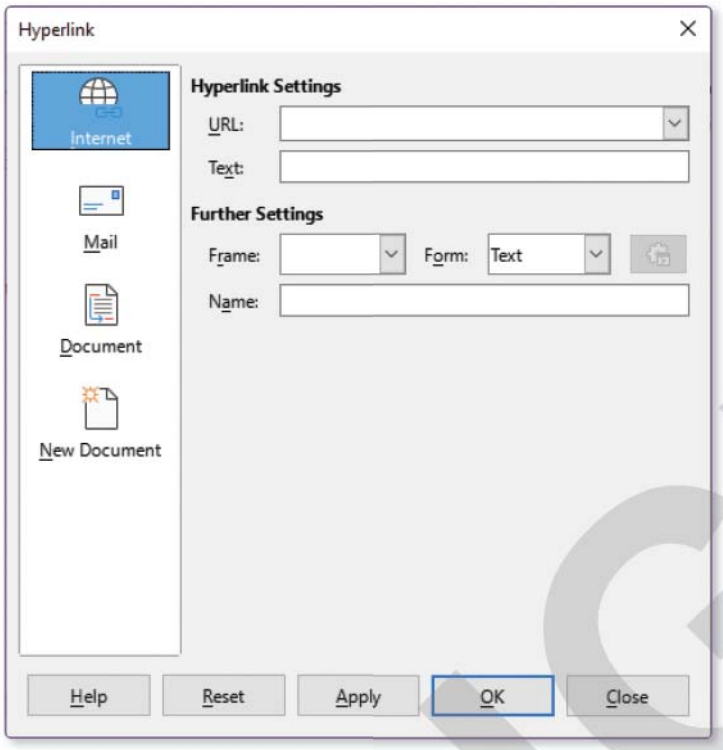
Select the **Insert → Hyperlink** option from the menu bar.



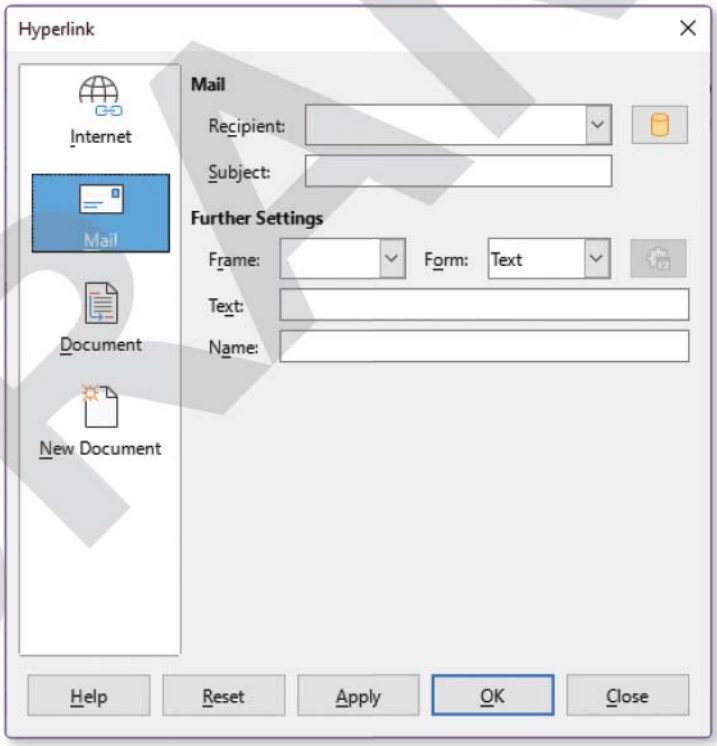
The **Hyperlink** dialog box will open.

Step 3: On the left hand side, select one of the four types of hyperlinks:

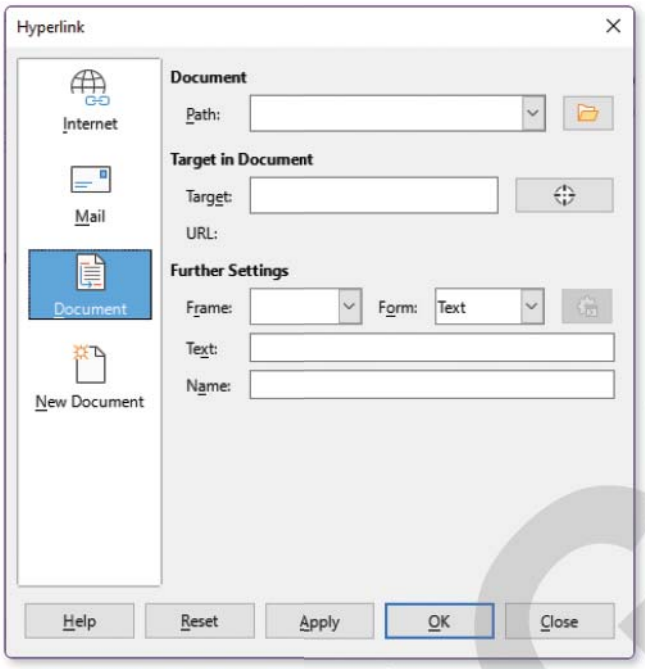
- **Internet:** This option allows you to insert a hyperlink to a website or web page. You can enter the URL (web address) of the website or webpage you want to link to in the **URL** text box. In the **Text** textbox type the text you wish to make as hyperlink.



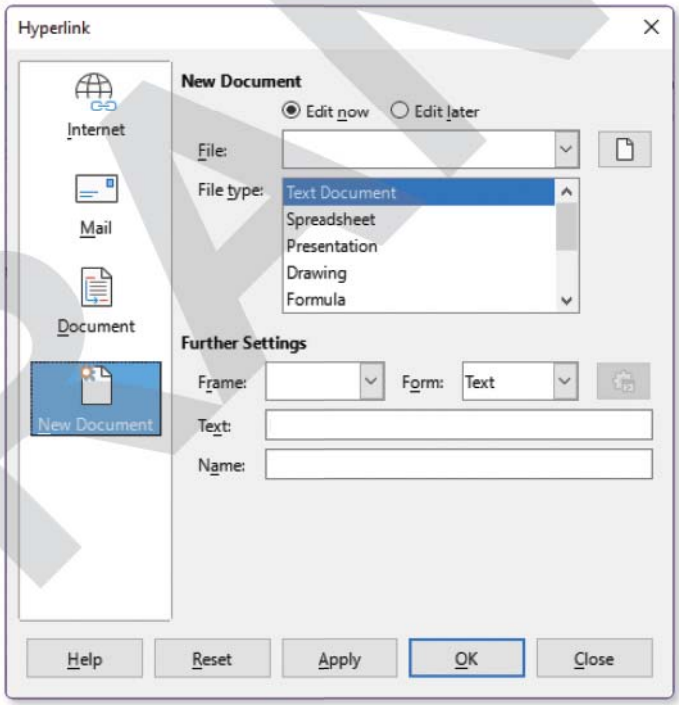
- **Mail:** This option creates a hyperlink to open an email message that is pre-addressed to a particular recipient. You need to specify the address of the recipient in the **Recipient** text box and the subject of the mail in the **Subject** text box. In the **Text** textbox type the text you wish to make as hyperlink.



- **Document:** This option allows you to link to another document or file on your computer or network. You can browse your file system to select the document you want to link to. For this, you need to click the **Browse** button to open a file. The path of the file is displayed in the **Path** text box. Click on the **Target** button to choose the sheet,, tables, frames, images, headings etc to be hyperlinked. In the **Text** textbox type the text you wish to make as hyperlink.



- **New Document:** enables you to create a hyperlink that will open a new, blank document. You can choose create and **Edit now** or just create it and **Edit later**. Select the **File type** as text, spreadsheet, etc. give a name to a file in **File** textbox. You may select the path for a specific directory where you wish to create your file. In the **Text** textbox type the text you wish to make as hyperlink.

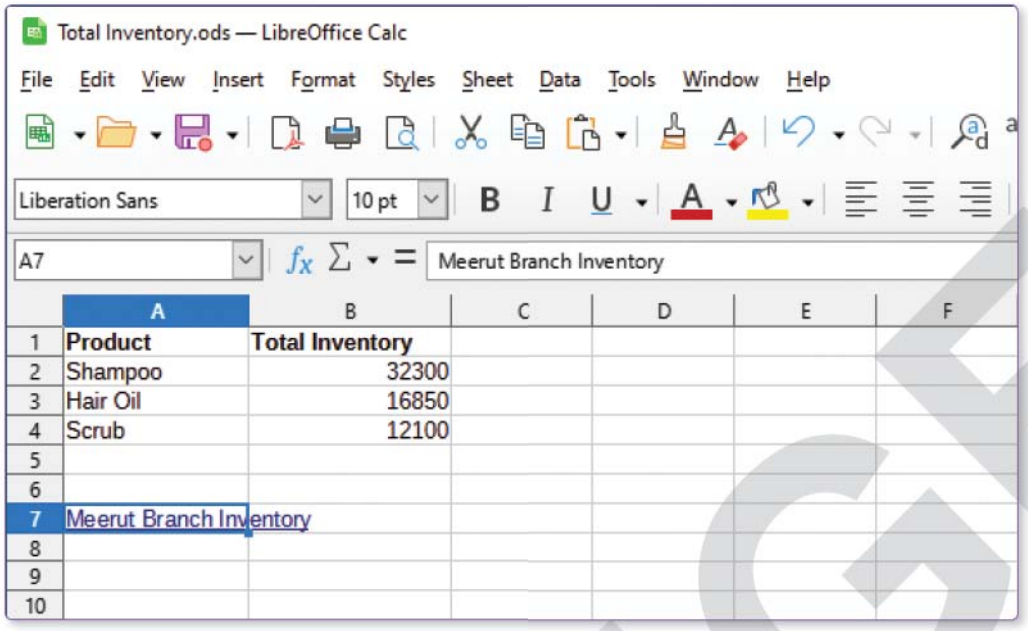


Some of the common steering in all four tabs are:

- **Frame:** This specifies how the link will open.
- **Form:** The hyperlink created will be a text or a button.
- **Text:** The text you type here will become a hyperlink.
- **Name:** It is the name of the hyperlink.

Step 4: Click on the **OK** button to create a hyperlink.

The hyperlink is created in the spreadsheet.

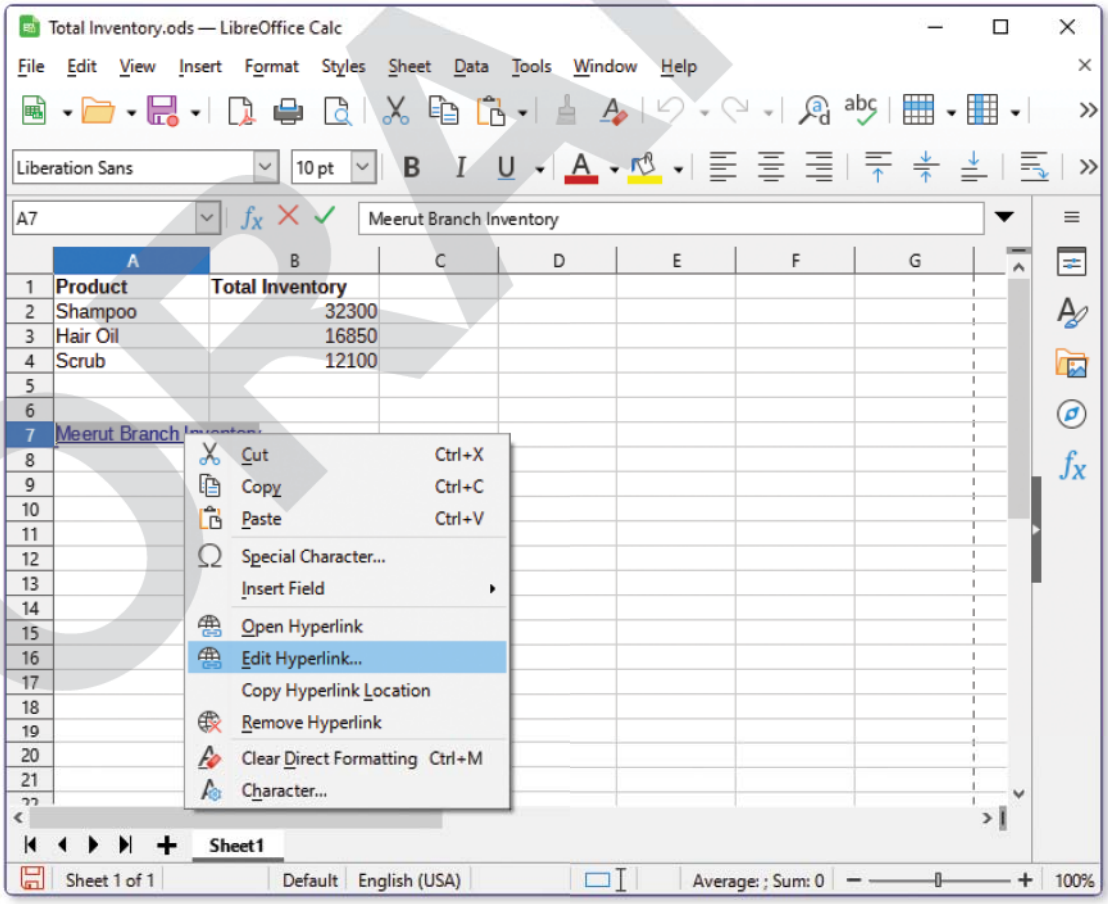


Edit a Hyperlink

To edit a hyperlink, perform the following steps:

Step 1: Place the cursor anywhere in the link.

Step 2: Right-click the hyperlink and select the **Edit Hyperlink** option from the context menu.



The **Hyperlink** dialog box opens.

Step 3: Modify the desired settings in the **Hyperlink** dialog box.

Step 4: Click on the **OK** button.

Removing a Hyperlink

To remove a hyperlink, perform the following steps:

Step 1: Place the cursor anywhere in the link from where you want to remove hyperlink.

Step 2: Right-click the hyperlink and select the **Remove Hyperlink** option from the context menu.

The hyperlink is removed from the text.

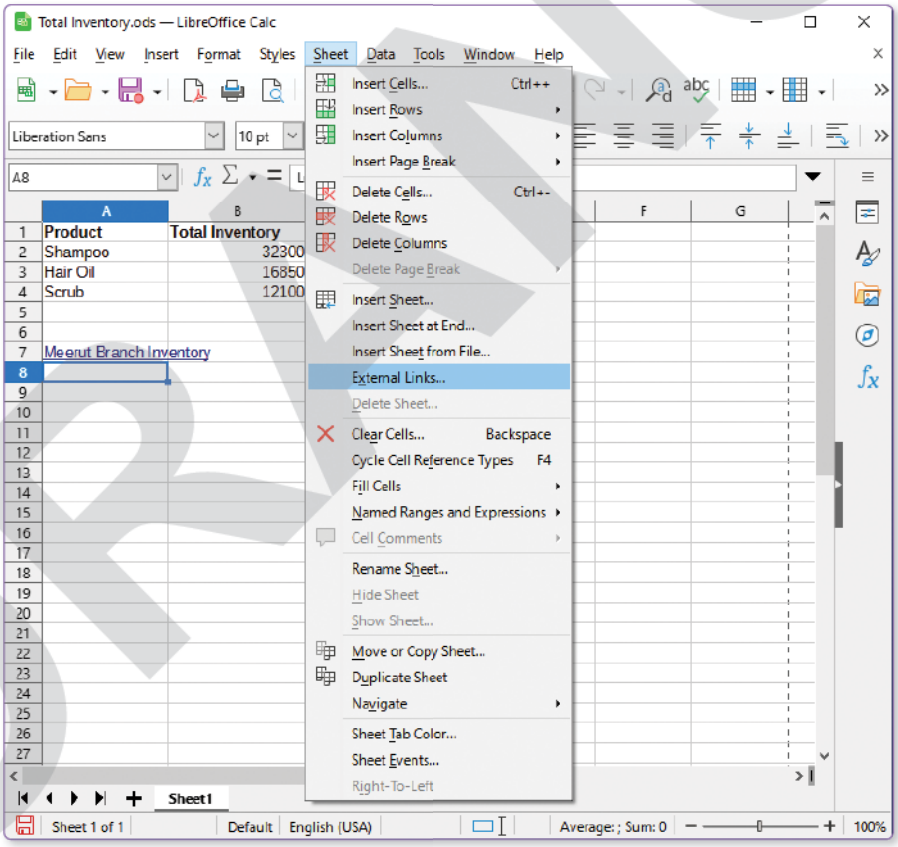
Linking to External Data

In LibreOffice Calc, a sheet can have data from an external source like an HTML table, data specified by named ranges from any spreadsheet like Excel, OpenOffice.org Calc, etc.

Follow the given steps to insert data from an external source:

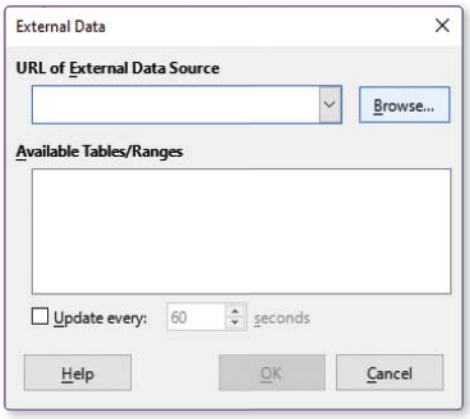
Step 1: Select the cell where you want to insert data from external source.

Step 2: Select the **Sheet → External link** option from the menu bar.



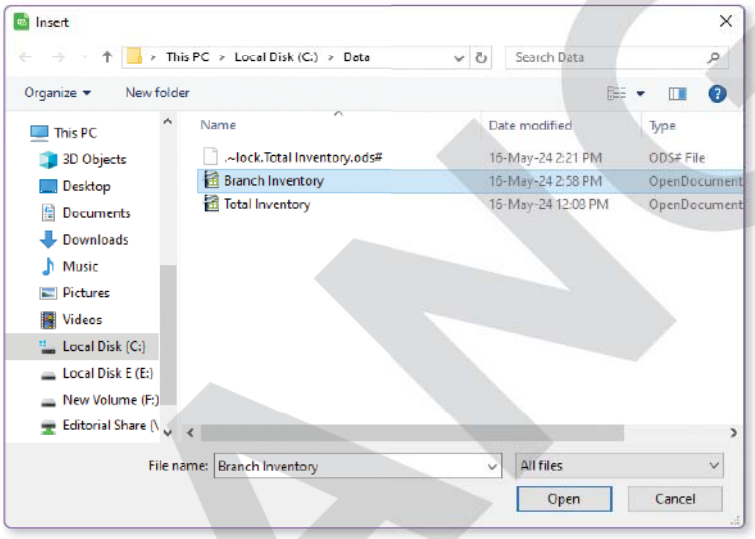
The **External Data** dialog box opens. This dialog box contains the following fields:

Step 3: Type the path of the external data source in the **URL of External Data Source** text box or click on the **Browse** button to select the file.



The **Insert** dialog box opens.

Step 4: Navigate the location and select the file. Then, click on the **Open** button.

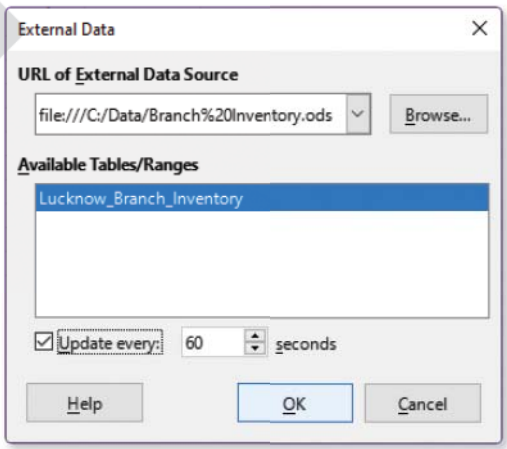


The path of the external source is displayed in the **URL of External Data Source** text box.

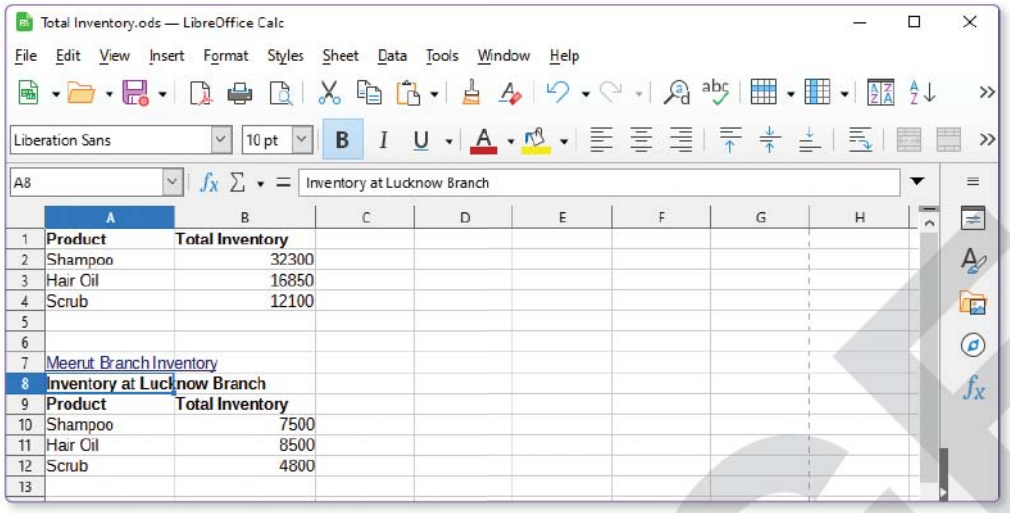
Step 5: Select the named ranges or tables you want to insert.

Step 6: Select the **Update every check box to specify the time by which** the selected ranges or tables are updated automatically.

Step 7: Click on **OK** button.



The external data is linked to the sheet.



Linking to Registered Data Sources

LibreOffice Calc enables us to link the spreadsheet documents with databases, and other data sources. For this, registering the data source within LibreOffice is essential. Because it informs LibreOffice about what kind of data being used and the file's location.

In this section, our focus will be on LibreOffice Base, which has .odb extension. To register a database in .odb format the steps are as follows:

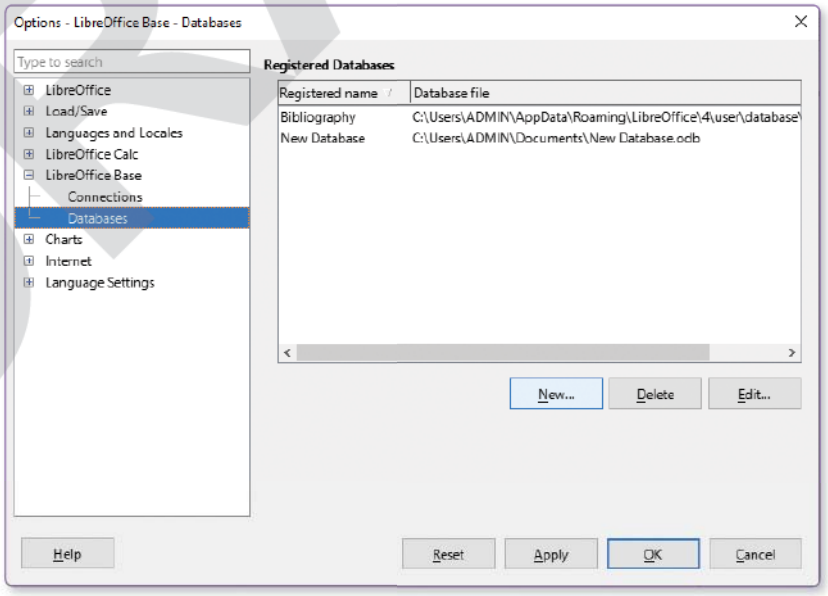
Step 1: Select the **Tools → Options** from the menu bar.

The **Options** dialog box opens.

Step 2: Click on the **LibreOffice Base** category. The **LibreOffice Base** category expands and displays the options.

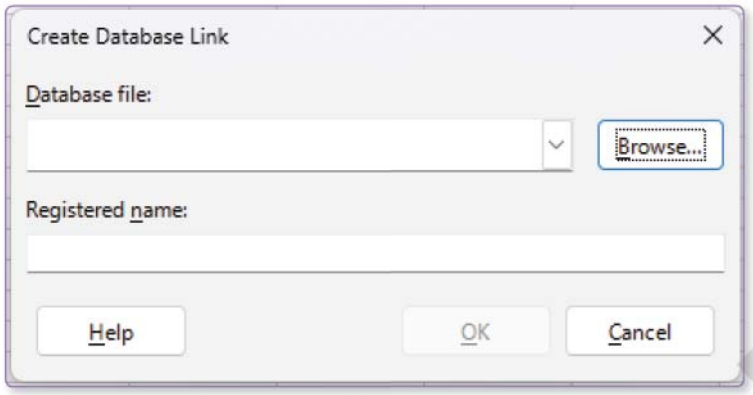
Step 3: Select the **Databases** option. The options related to database displays on the right-side of the **Options** dialog box.

Step 4: Click on **New** button.



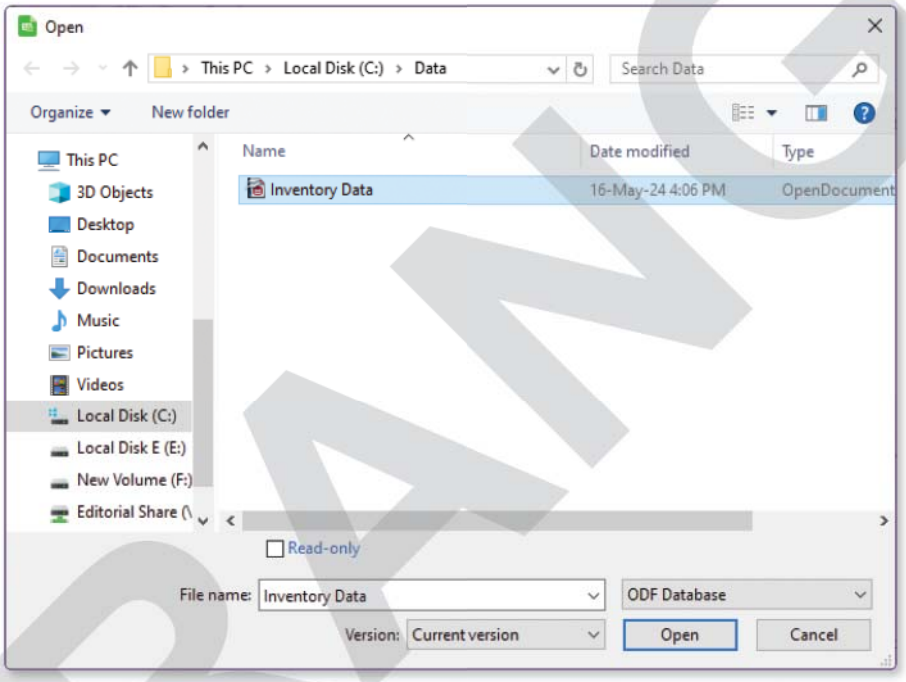
The **Create Database Link** dialog box opens.

Step 5: Click on the **Browse** button.



The **open** dialog box appears.

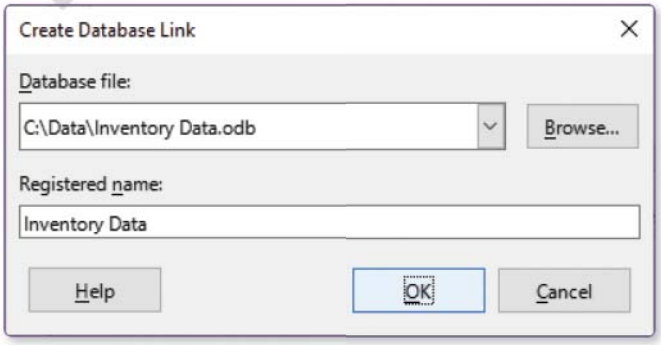
Step 6: Navigate the location and select the database file. Then, click on the **Open** button.



The path of the data source is displayed in the **Database file** text box.

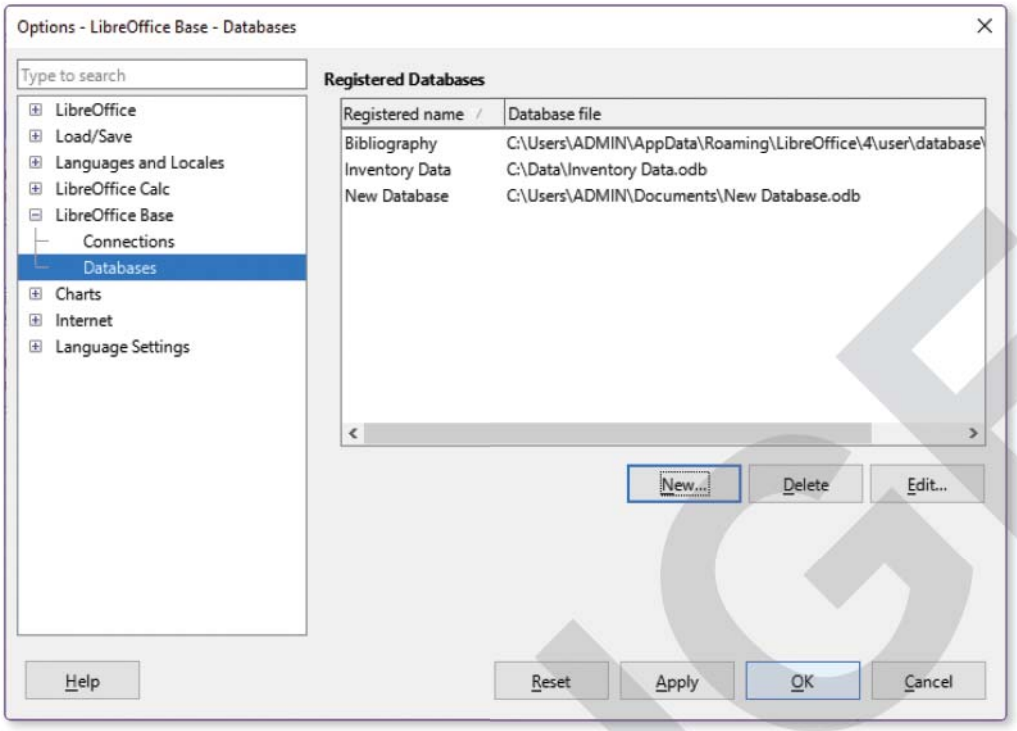
Step 7: Type a registered name of the database in the **Registered name** text box.

Step 8: Click on **OK** button.



The database is added to the list of registered databases.

Step 9: Click on **OK** button to use the selected database.



Note that the OK button is enabled only when both fields are filled in.

I KNOW

Tick (✓) if you know this.

- ► The default name of the sheet can be changed by renaming a sheet with a new name. ○
- ► The main advantage of using cell reference is that it can be used in formulas and functions. ○
- ► A cell reference is the method used to refer to a cell or a range of cells in a spreadsheet. ○
- ► Solver is a tool that helps you do backward calculation of the input to obtain the desired output. ○
- ► Hyperlink means a content when clicked will open another linked file. ○

SHARING SPREADSHEET

A file is sometimes required to be accessed by multiple users at the same time for editing. For this purpose, the file can be placed in the network or shared location so that it can be shared by several users and can be accessed simultaneously.

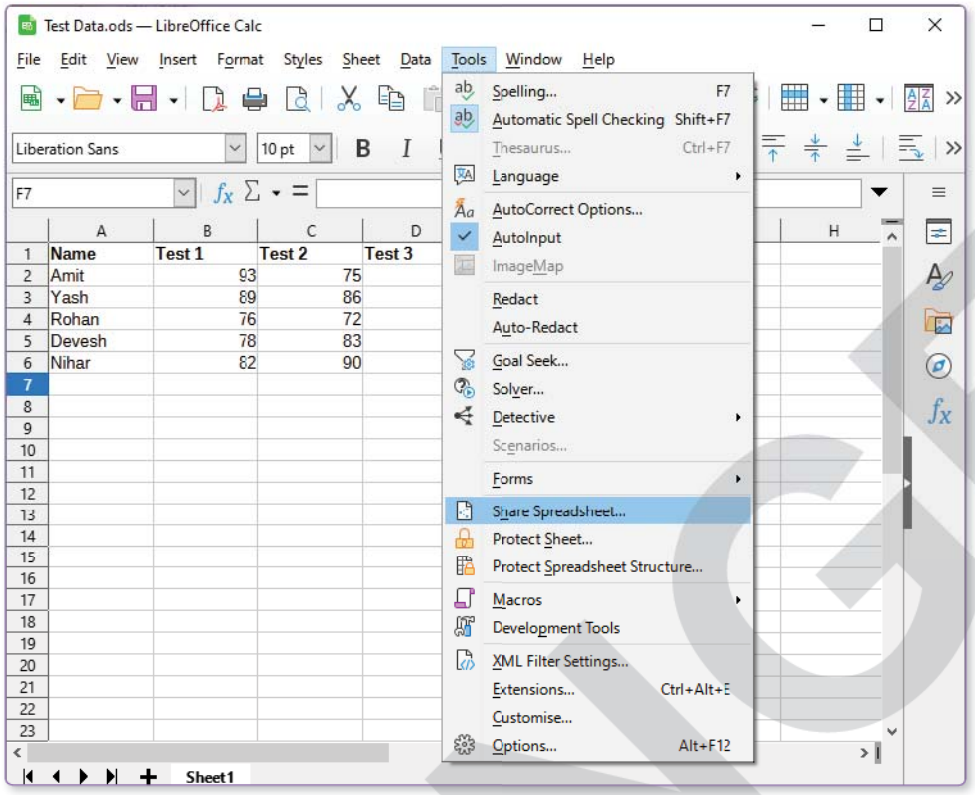
Sharing a spreadsheet refers to the way of allowing multiple users to access and work together on the same document simultaneously.

It saves the trouble of keeping track of multiple copies of the same spreadsheet. Sharing allows working in collaboration so that everyone can contribute, make changes and view it.

The steps to make the spreadsheet shareable with the other users are as follows:

Step 1: Open the spreadsheet.

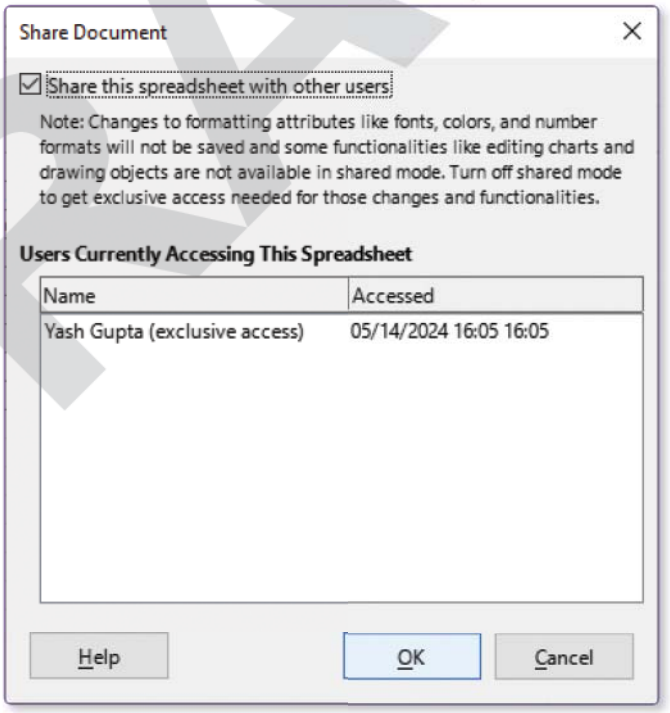
Step 2: Select on the **Tools → Share Spreadsheet...** option from the menu bar.



The **Share Document** dialog box opens.

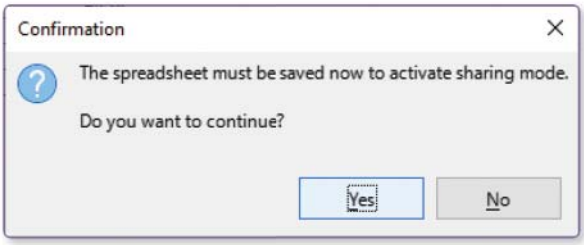
Step 3: Select the **Share this spreadsheet with other users** check box to enable the sharing feature.

Step 4: Click on **OK** button.

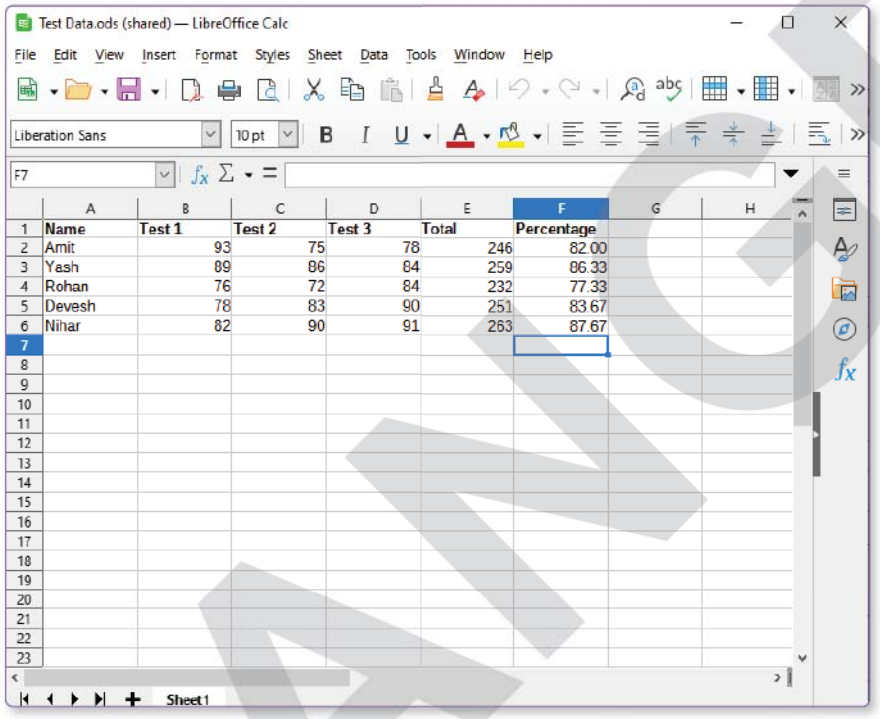


The **Confirmation** message box opens.

Step 5: Click on **Yes** button to continue.



The **(shared)** word is displayed with the file name on the Title bar to indicate that the file is in the shareable mode.



	A	B	C	D	E	F	G	H
1	Name	Test 1	Test 2	Test 3	Total	Percentage		
2	Amit	93	75	78	246	82.00		
3	Yash	89	86	84	259	86.33		
4	Rohan	76	72	84	232	77.33		
5	Devesh	78	83	90	251	83.67		
6	Nihar	82	90	91	263	87.67		

If you wish to reverse the shared mode into unshared mode, then make a copy of the same file using **File → Save as**. This will create a copy of the spreadsheet without shareable mode.

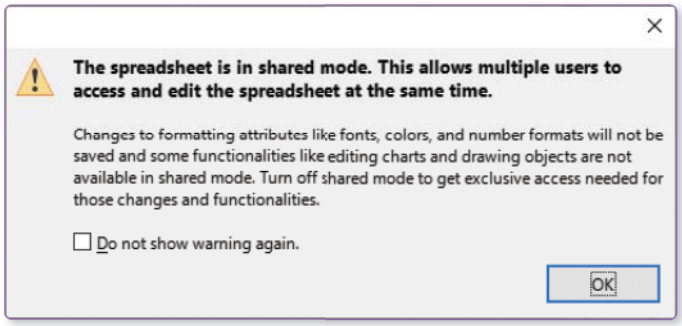
Opening Spreadsheet

Perform the following steps to open a shared spreadsheet:

Step 1: Double-click the shared spreadsheet to open it.

A warning message appears that shows the message "The spreadsheet is in shared mode. This allows multiple users to access and edit the spreadsheet at the same time."

Step 2: Click on the **OK** button.

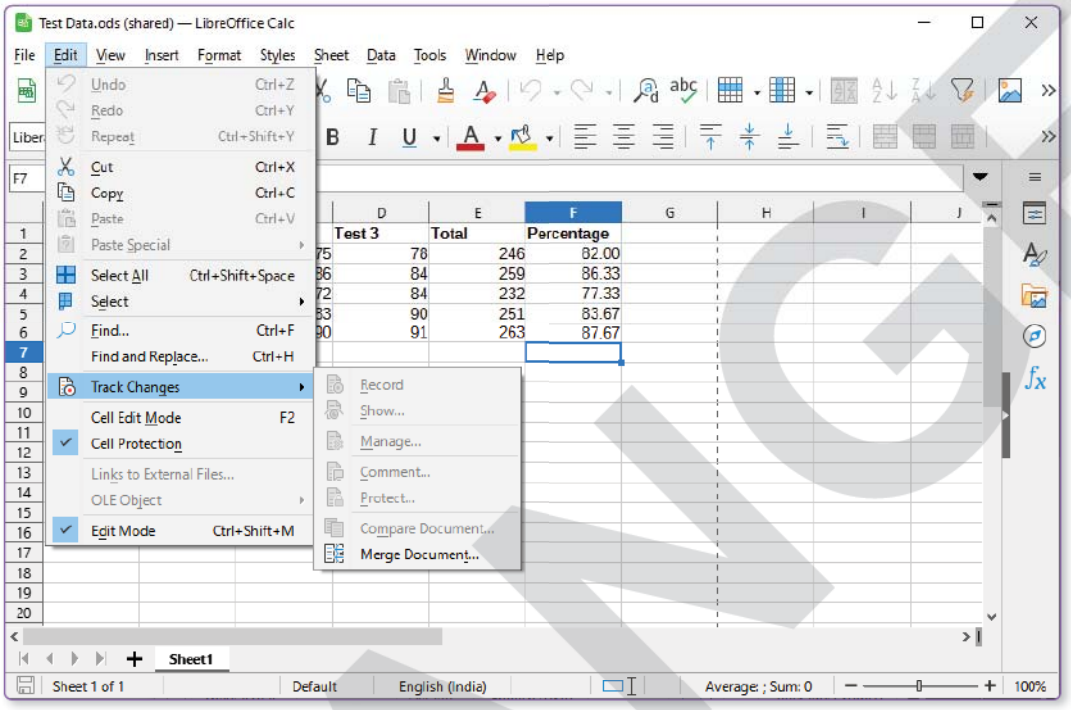


If you do not want this see this warning again and again, then you need to select the **Do not show warning again** check box.

Whenever a sheet is opened in a shared mode then some of the features of LibreOffice Calc are disabled.

The Some the features which are disabled are as follows:

- The Undo, Redo, Repeat, Links to External files, OLE Objects Track Change (except Merge Document) features are disabled in the Edit menu.



Saving a Shared Spreadsheet

There may be different issues with the shared document whenever you wish to save them:

When you save a shared spreadsheet, if it has not been modified and saved by another user since you opened it, it is saved as usual.

- If the spreadsheet has been modified and saved by another user since you opened it, one of the following will occur:
- If the changes made by others do not conflict with the changes made by you then the document is saved and the message "Your spreadsheet has been updated with changes saved by other users" appears, and any cells modified by the other user are shown with a red border.
- If the changes conflict, the **Resolve Conflicts** dialog will appear. You must decide for each conflict which version to keep, yours or the other person's. When all conflicts are resolved, the document is saved. While you are resolving the conflicts, no other user can save the shared document.
- No two or more users can save the same shared document at the same time. If the other user is trying to save the same shared document. Then you will not have the permission to save it. The document will be locked with the message merge-in in progress. You have to cancel the save command and retry later.

When you successfully save a shared spreadsheet, the document shows the latest version of all changes saved by all users.

RECORD CHANGES IN A SPREADSHEET

LibreOffice Calc allows you to keep a track of the changes made in a document using the Record option. If you make any changes in the original document, then your name along with new value and the cell address will be saved so that if you want to undo the changes you may have that option later. While recording the changes, the spreadsheet will turn off its shared feature.

To enable the Record changes, first disable the shared mode of the spreadsheet. The steps are:

Step 1: Select the **Tools → Share Spreadsheet** option from the menu bar.

The **Share Document** dialog box opens.

Step 2: Uncheck the **Share this spreadsheet with other users** check box to disable the sharing mode.

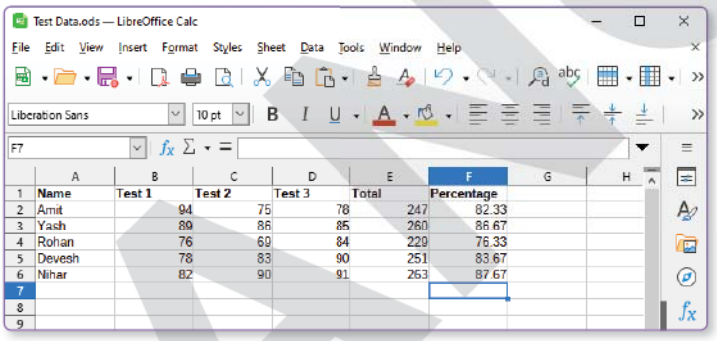
Step 3: Click on **OK** button.

The Warning dialog box opens that will give warning to disable the shared mode of a spreadsheet.

Step 4: Click on **OK** button to continue to disable the sharing mode.

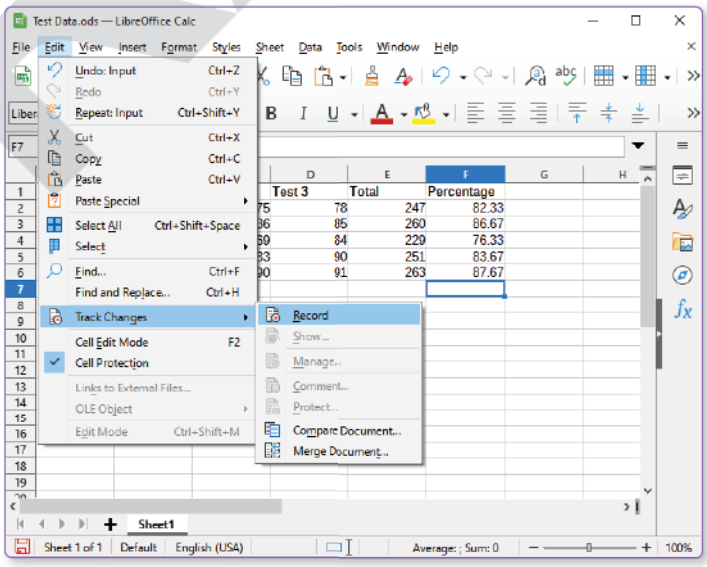
Now follow the given steps to record the changes:

Step 1: Open a existing spreadsheet.



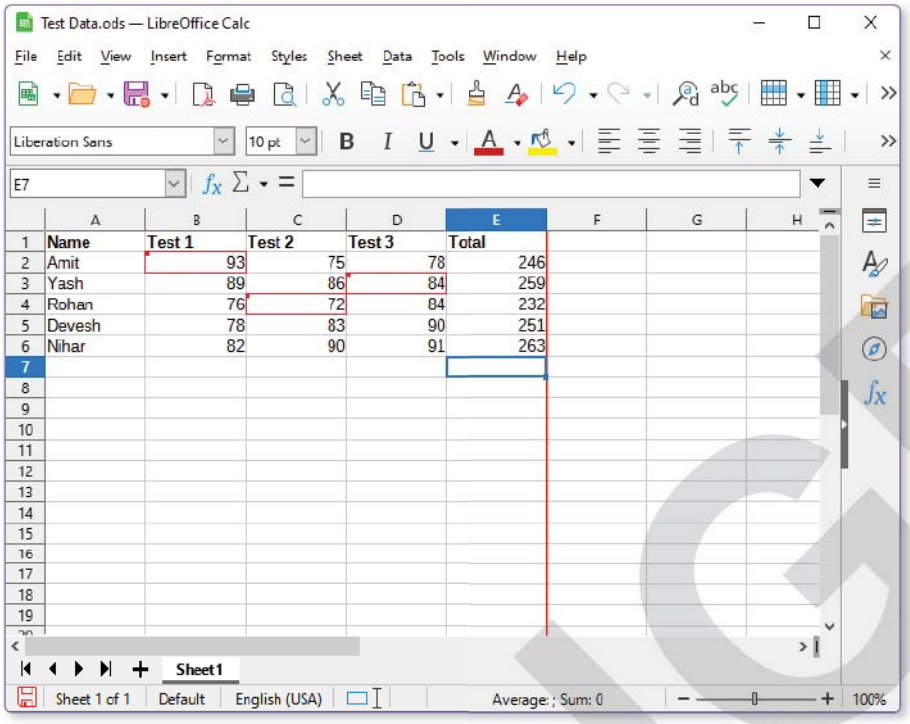
Step 2: Select the **Edit → Track Changes** option from the menu bar.

Step 3: Select the **Record** option from the submenu. Record Option was disabled and not working in the shared spreadsheet.



Now, the Record feature gets activated.

Step 4: Changes made in the spreadsheet will be recorded and reflected with red border as shown below:



	A	B	C	D	E	F	G	H
1	Name	Test 1	Test 2	Test 3	Total			
2	Amit	93	75	78	246			
3	Yash	89	86	84	259			
4	Rohan	76	72	84	232			
5	Devesh	78	83	90	251			
6	Nihar	82	90	91	263			
7								
8								
9								
10								
11								
12								
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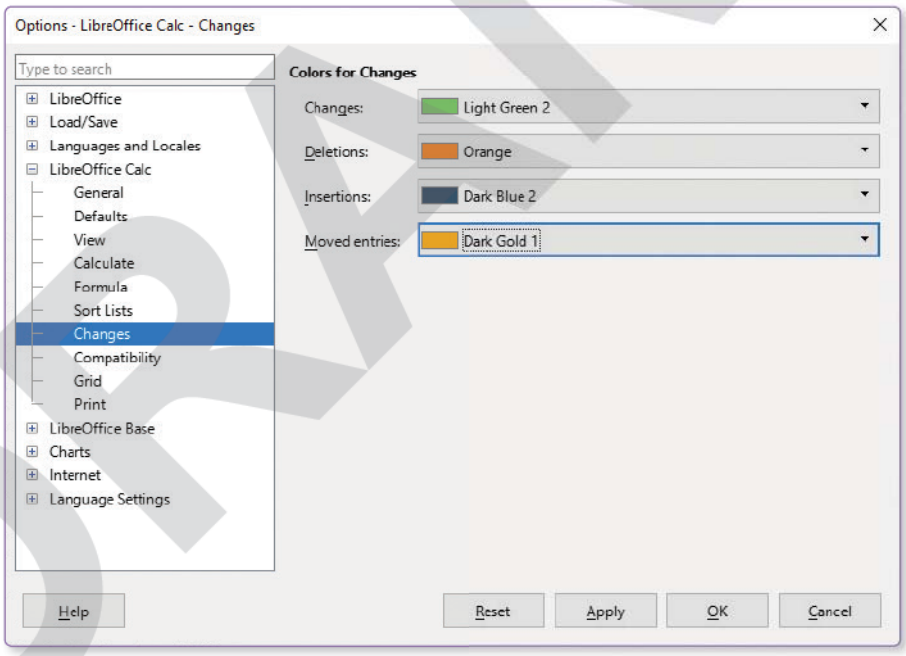
14								
15								
16								
17								
18								
19								

A deleted column or row is marked by a heavy red bar. This red colour can be changed to some other colour by selecting **Tools → Options → LibreOffice Calc → Changes.**



Note that: Some changes, for example cell formatting, are not recorded and marked.

Viewing Changes Made Using Record Option

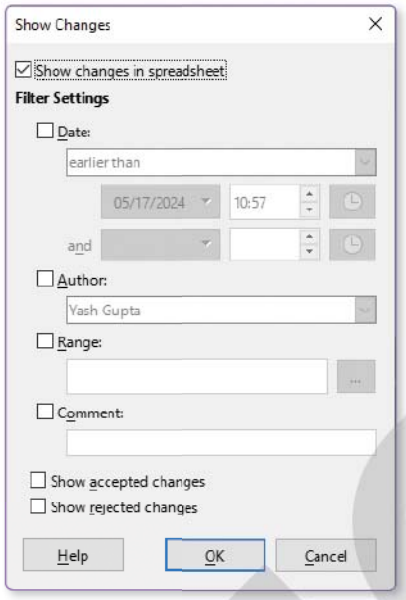
LibreOffice Calc gives you great control over what changes you see when reviewing a sheet. To see the changes made using Record options, perform the following steps:

Step 1: Open the reviewed spreadsheet.

Step 2: Select the **Edit → Track Changes** option from the menu bar.

Step 3: Select the **Show** option from the submenu.

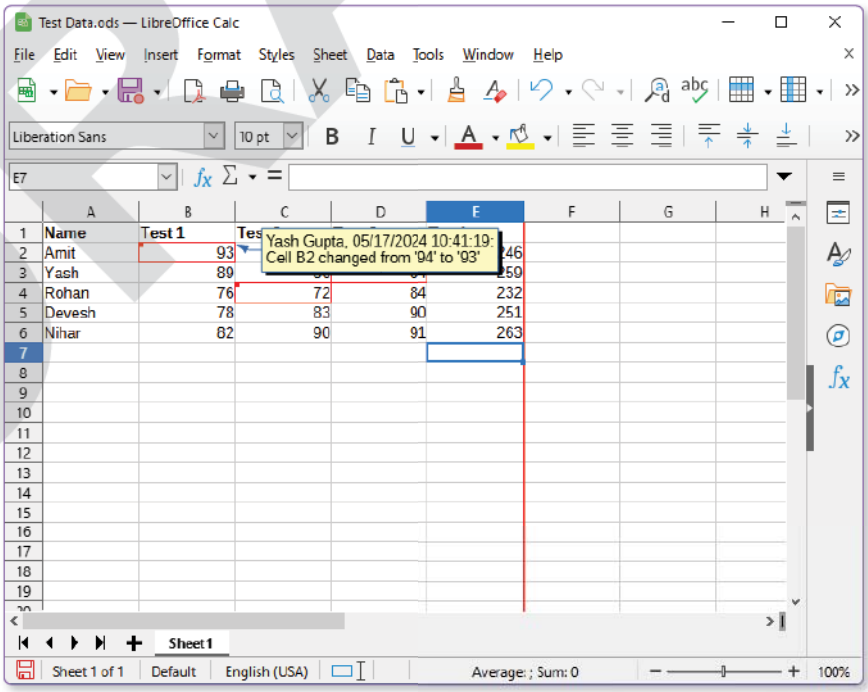
The **Show Changes** dialog box opens.



Various options related to filter settings will help you to display the changes made with respect to the options:

- **Date:** Changes made in the specified date and time range will be displayed.
- **Author:** Changes made by the specified author will be displayed. This option is useful when multiple users are editing the same file.
- **Range:** Changes made in the specified range of cells will be visible.
- **Comment:** Changes with the comments matching the search criteria will be displayed.
- **Show accepted changes:** Changes that you accepted in a file will be displayed.
- **Show rejected changes:** Changes that you rejected in a file will be displayed.

You can see the changes by place the mouse cursor over the changed cell.



Accepting or Rejecting Changes

Record Changes are just suggested changes by one or different users. To make these changes permanent, the changes must be accepted. On the other hand, the author may disagree with some of the tracked changes and choose to reject them. When we edit a document in which others users have made changes, author can accept or reject the changes individually or altogether.

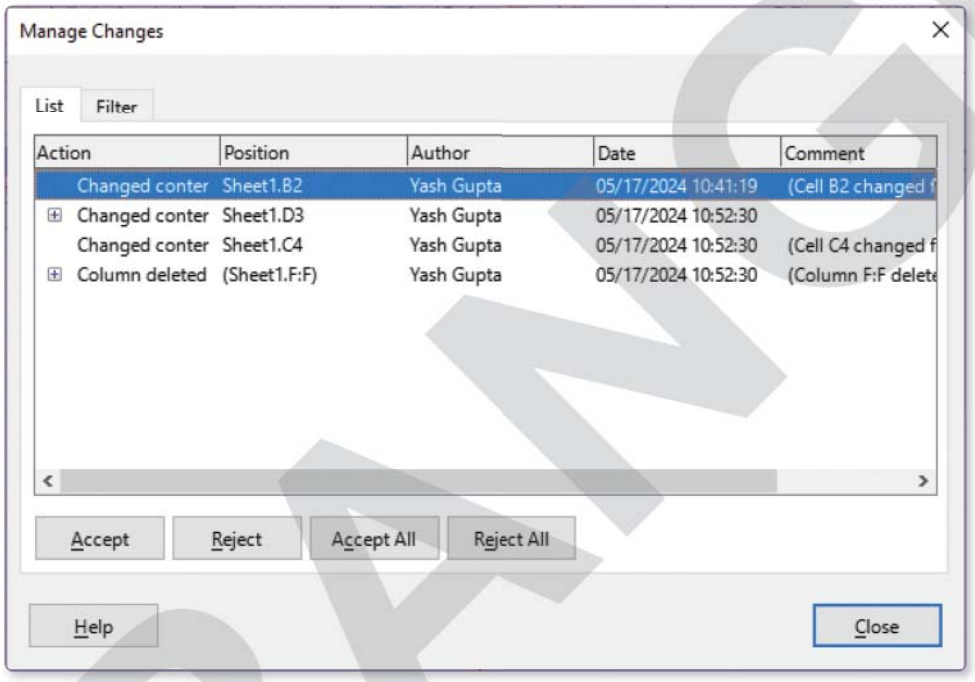
To accept or reject changes in a spreadsheet, perform the following steps:

Step 1: Open the reviewed spreadsheet.

Step 2: Select the **Edit → Track Changes** option from the menu bar.

Step 3: Select the **Manage** option from the submenu.

The **Manage Changes** dialog box opens.



The given dialog box will appear with the list of changes done in the sheet.

Step 4: Click the **Accept** or **Reject** button to accept or reject the selected changes made, respectively. In our case, we have rejected the Column deleted change.

Step 5: Click the **Accept All** or **Reject All** button to accept or reject all the changes made, respectively.

Step 6: Click the **Close** button to close the **Manage Changes** dialog box dialog box.

Adding Comments to Changes

LibreOffice Calc allows you to add comments to the changes made by the users in the original data. In Calc, the comments are automatically added. The author or reviewer can also add their own comments as well. The steps to add comment to the changes made are:

Step 1: Select the changes cell in the reviewed spreadsheet.

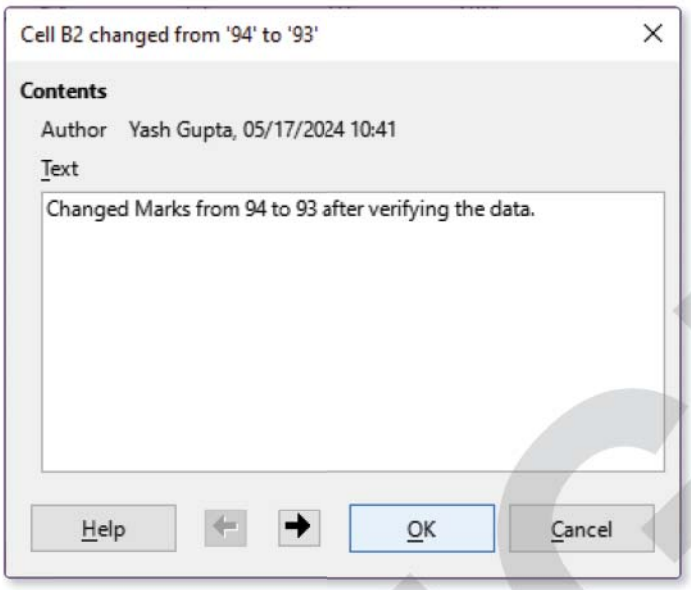
Step 2: Select the **Edit → Track Changes** option from the menu bar.

Step 3: Select the **Comment** option from the submenu.

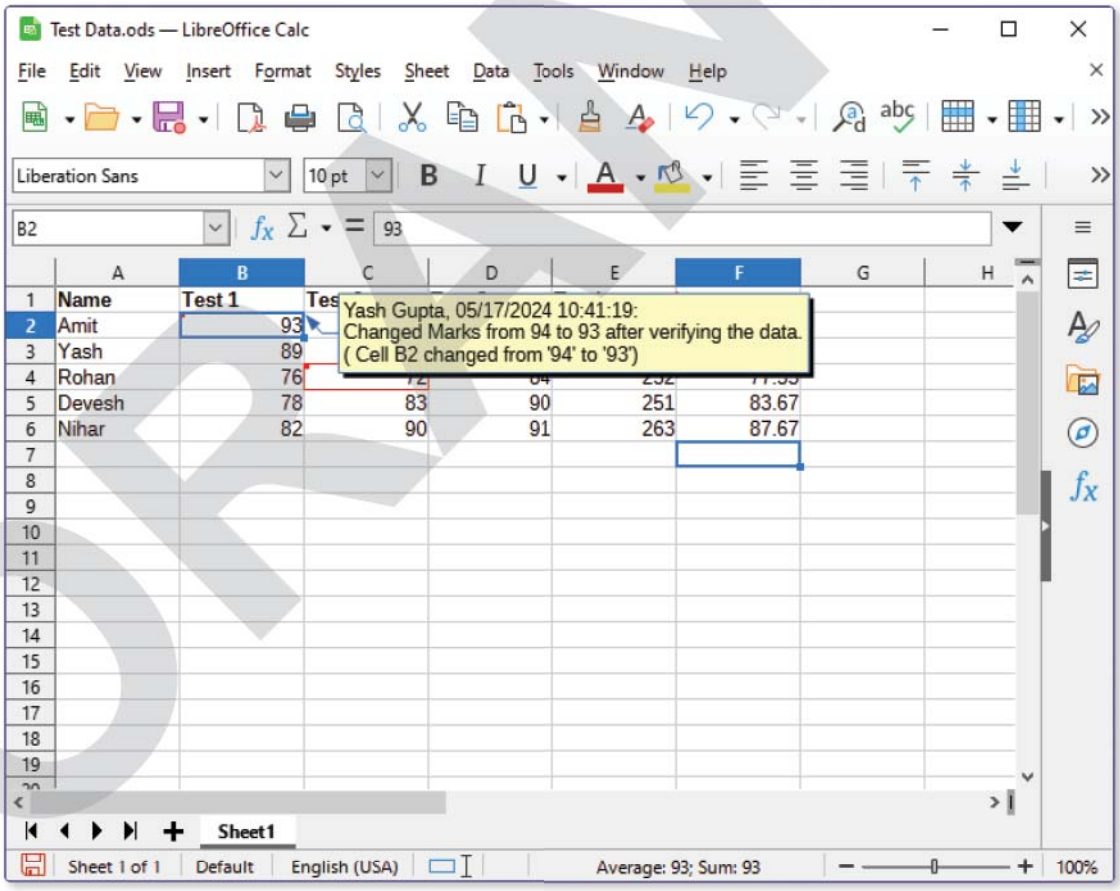
The dialog box opens with automatically-added change (in our case, **Cell B2 changed from '94' to '93'**) displayed in the title bar.

Step 4: Type your own comment in the **Text** text box.

Step 5: Click on the **OK** button.



When you hover your mouse pointer over the cell with the comments then the above created comments will be displayed.



Formatting Comment

You can format the comment box, just like formatting the cell contents. It means changing the background colour, border style, and transparency of a comment.

Follow the following steps to format the comment.

Step 1: Right click on the cell where the comment is added.

Step 2: Select the option "Format cell", which will display the Format Cells dialogue box.

Step 3: You can apply the various formatting features from its tab such as Font, font Effects, Alignment, Borders, Background and Cell Protection. Change the font, text colour, fill colour, line colour for the comment box as desired and click on OK button to apply the changes.

Observe the desired formatting features applied to the comment box.

Merging Spreadsheet

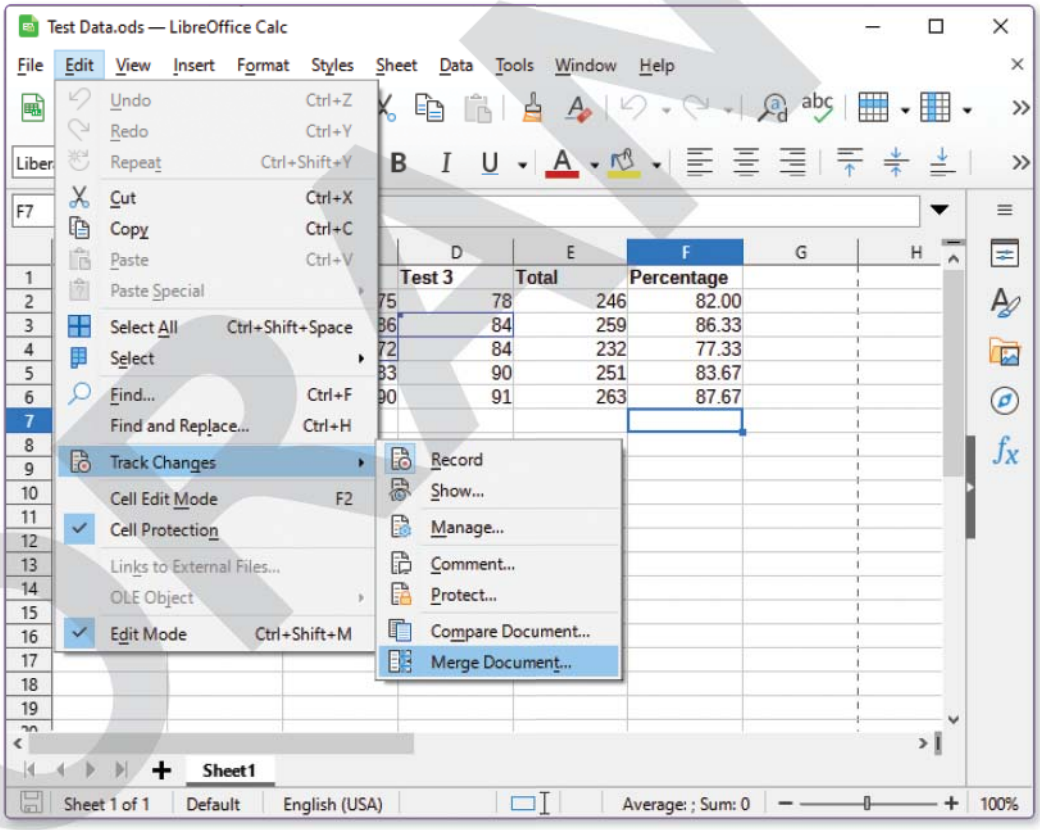
This feature helps you to merge two or more different versions of a spreadsheet into one. Sometimes multiple users are editing the same document so you wish to see the merged changes in one spreadsheet. This is the best option to merge multiple changes to avoid confusion and to speed up the document review.

The steps to merge spreadsheet are as follows:

Step 1: Open the original spreadsheet.

Step 2: Select the **Edit → Track Changes** option from the menu bar.

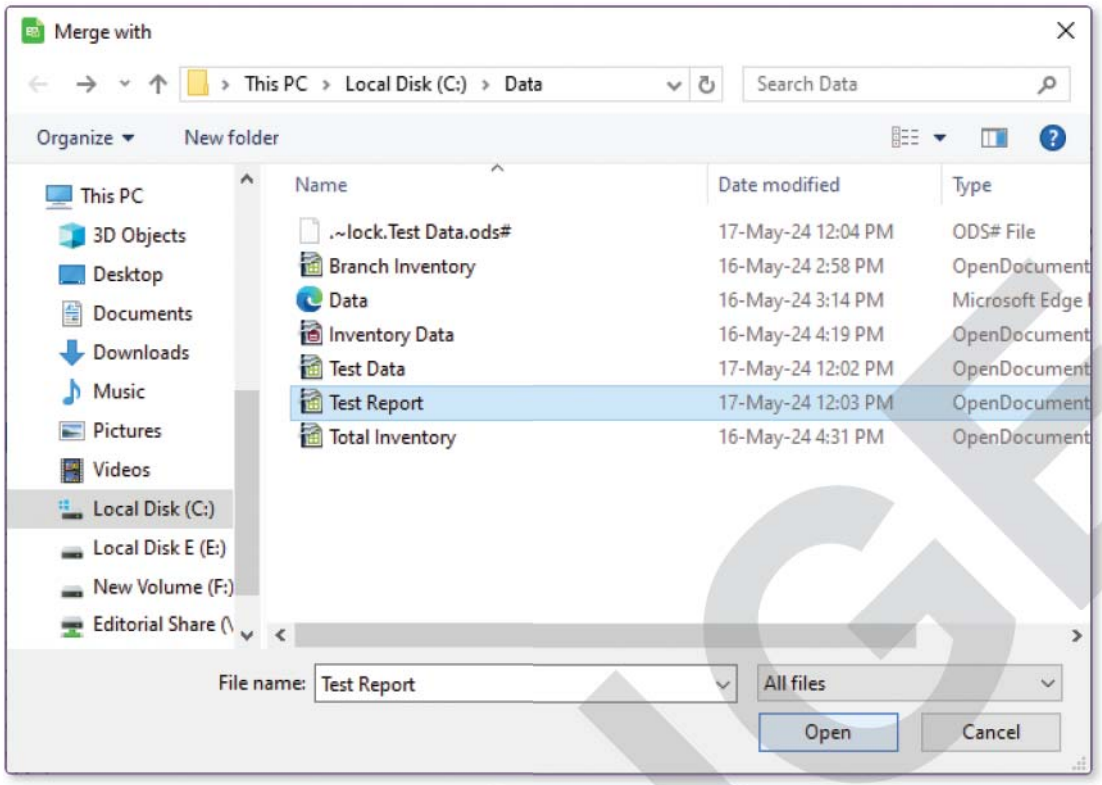
Step 3: Select the **Merge Document** option from the submenu.



The **Merge with** dialog box opens.

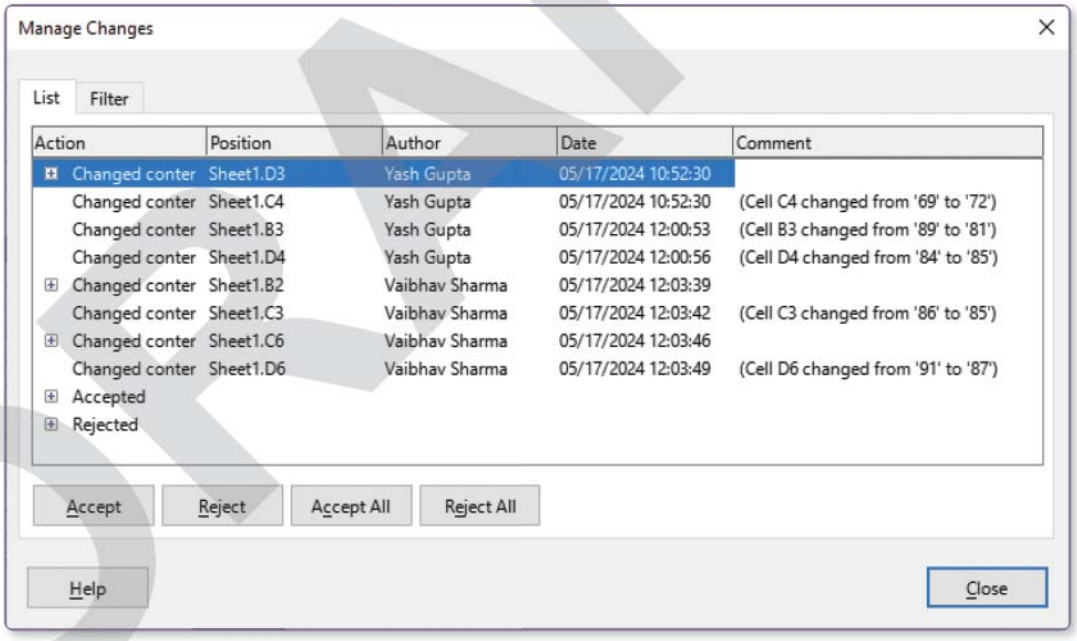
Step 4: Select the file that you want to merge with the original file.

Step 5: Click on **Open** button.

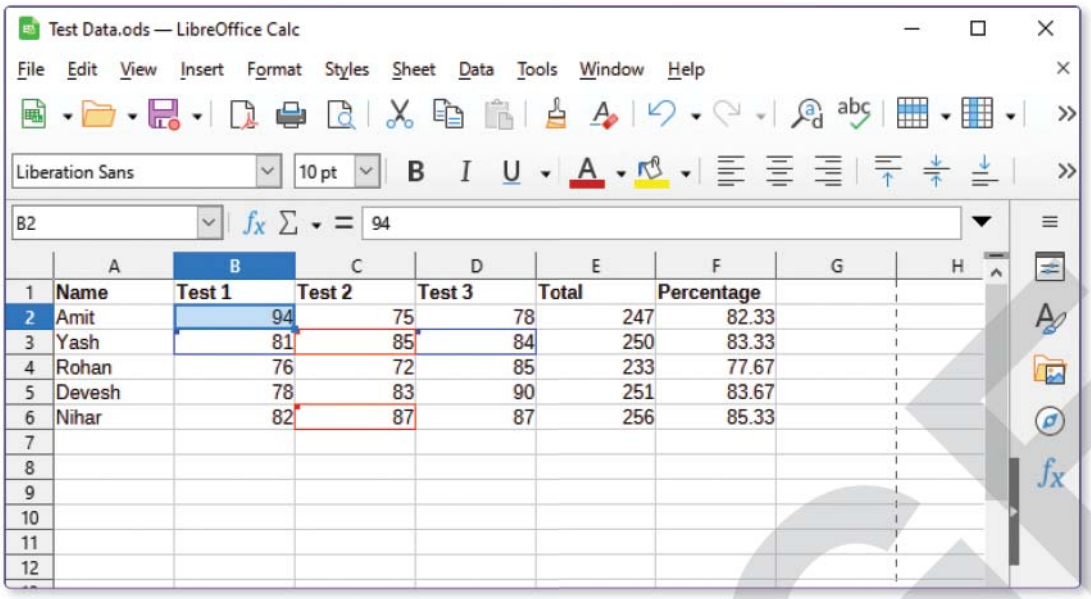


The **Manage Changes** dialog box opens with the changes of both users or authors.

Step 6: Accept or reject the changes and click on **Close** button for the final merged document.



The merged file displayed will show the content merged from both the files.



	A	B	C	D	E	F	G	H
1	Name	Test 1	Test 2	Test 3	Total	Percentage		
2	Amit	94	75	78	247	82.33		
3	Yash	81	85	84	250	83.33		
4	Rohan	76	72	85	233	77.67		
5	Devesh	78	83	90	251	83.67		
6	Nihar	82	87	87	256	85.33		
7								
8								
9								
10								
11								
12								

Comparing Documents

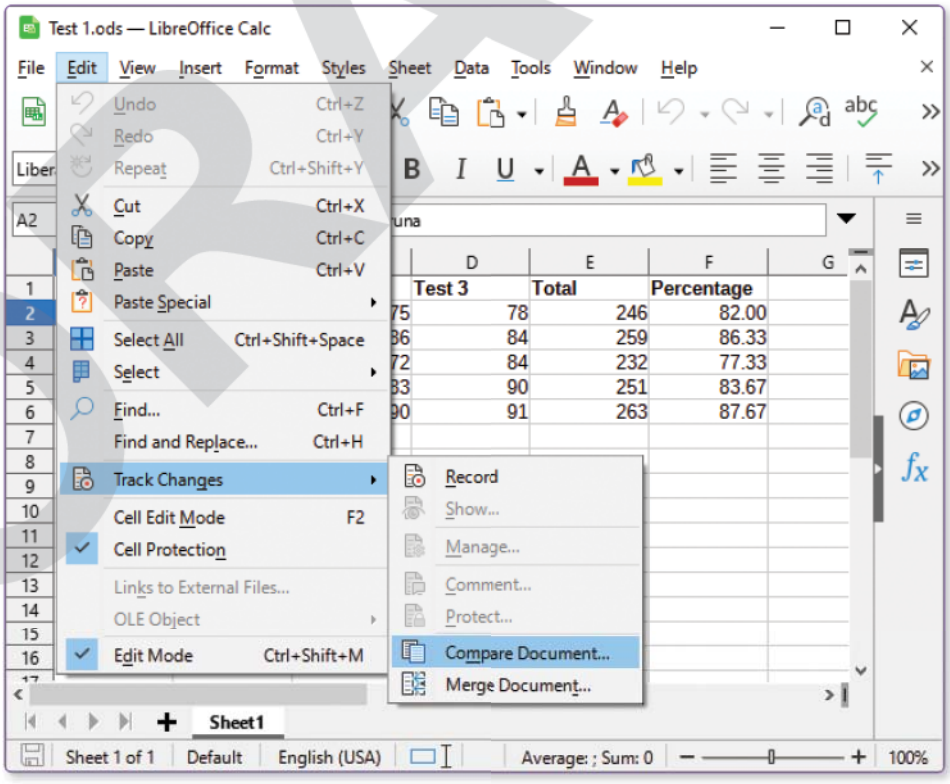
If you edit an original spreadsheet without recording the changes made into it then comparing the edited version with the original version is the best option to figure out the kind of changes done in the document. Also it is a good practise that instead of merging two spreadsheets, one can compare the two spreadsheets by comparing the documents.

The steps to compare the files are as follows:

Step 1: Open edited spreadsheet.

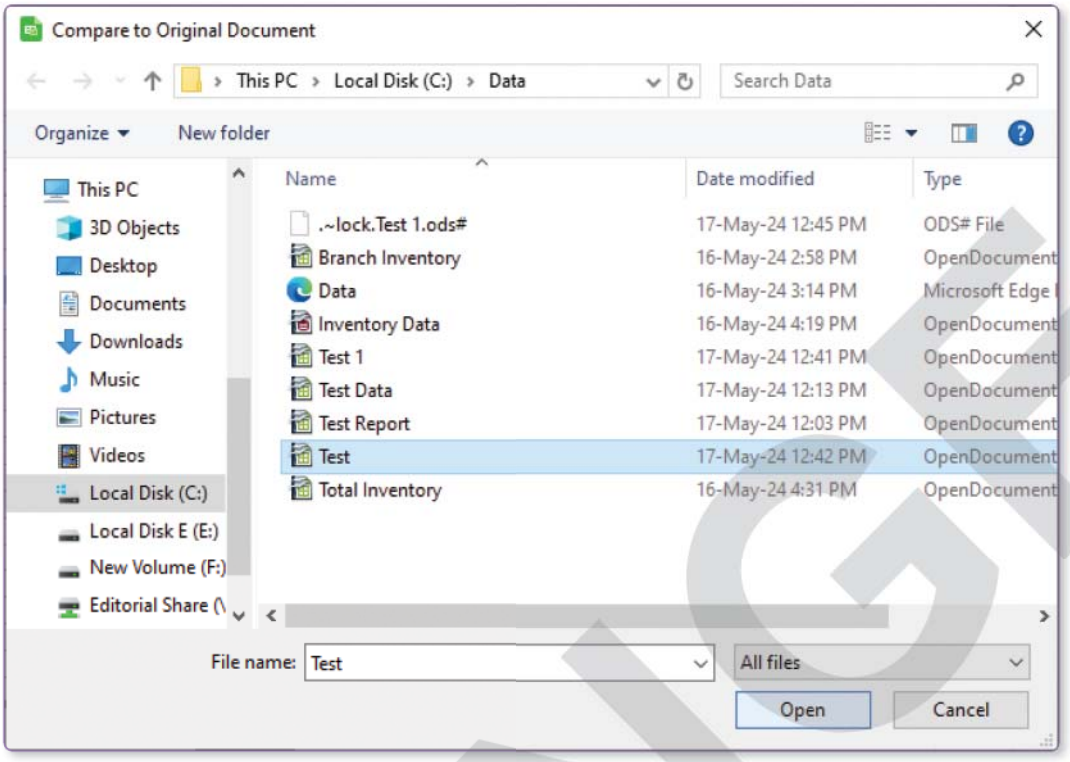
Step 2: Select the **Edit → Track Changes** option from the menu bar.

Step 3: Select the **Compare Document** option from the submenu.



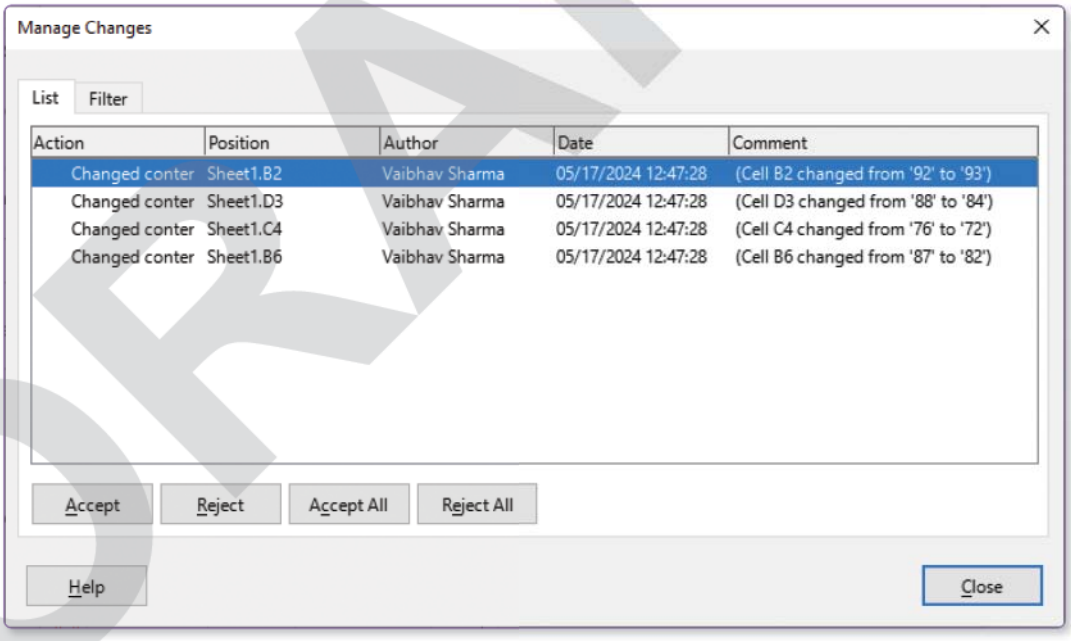
The **Compare to Original Document** dialog box appears.

Step 4: Select the original spreadsheet and click on **Open** button.



The **Manage Changes** dialog box opens with the changes after comparing the document.

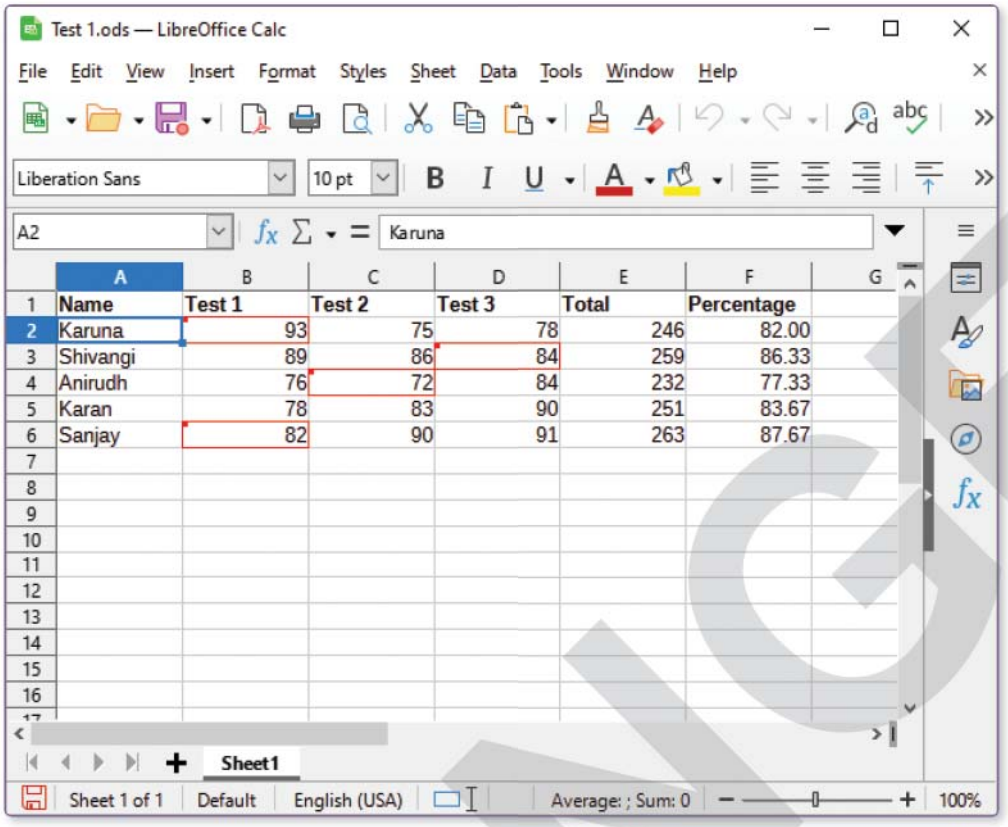
Step 5: Accept or reject the changes and click on **Close** button.



The following changes will be marked:

- Data found in the edited version but not in the original is marked as **inserted**.
- Data found in the original file but not in the edited version is marked as **deleted**.
- Data which is changed is marked as **changed**.

The compared file is displayed below:



	A	B	C	D	E	F	G
1	Name	Test 1	Test 2	Test 3	Total	Percentage	
2	Karuna	93	75	78	246	82.00	
3	Shivangi	89	86	84	259	86.33	
4	Anirudh	76	72	84	232	77.33	
5	Karan	78	83	90	251	83.67	
6	Sanjay	82	90	91	263	87.67	

From this point you can go through and accept or reject changes, as described earlier.

I KNOW

Tick (✓) if you know this.

- A spreadsheet is sometimes required to be accessed by multiple users at the same time for editing. ○
- Whenever a sheet is opened in a shared mode then some of the features of LibreOffice Calc are disabled. ○
- No two or more users can save the same shared document at the same time. ○

COMMENTS IN SPREADSHEET

Comments in spreadsheets serve the purpose of providing additional information, context, or explanations about specific data or formulas within the spreadsheet. This feature is particularly useful for collaboration, as it allows multiple users to understand the justification behind certain entries or calculations. Additionally, comments help maintain the integrity and transparency of the spreadsheet by documenting the thought process behind each data point.

Adding Comment

To add comments in a spreadsheet, perform the following steps:

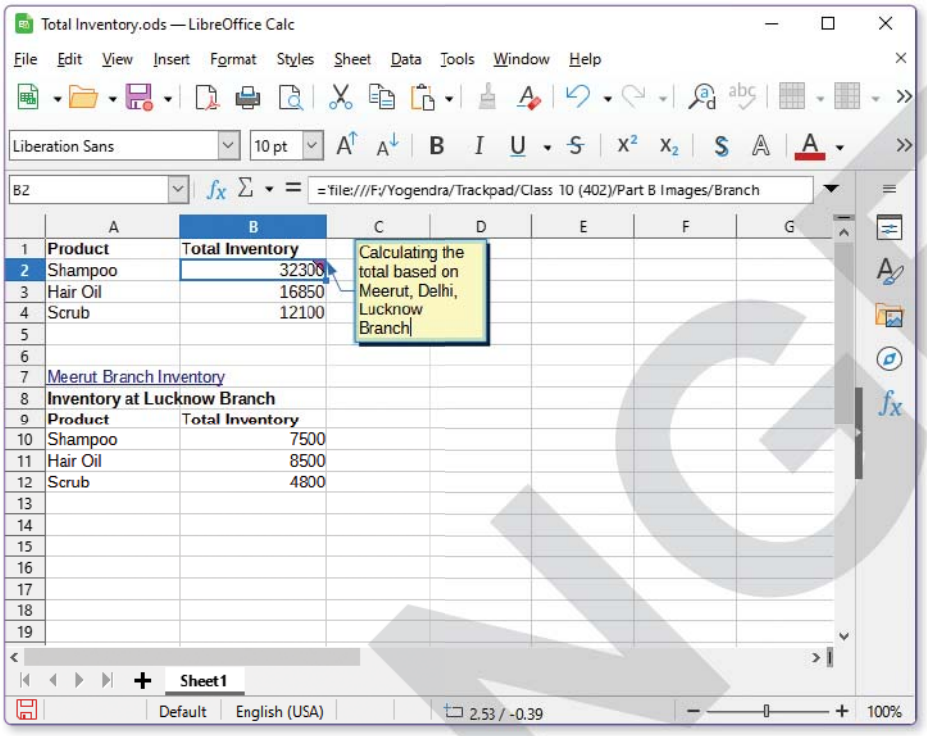
Step 1: Select the **Insert → Comments** option from the menu bar.

OR

Click the **Insert Comments** button in the **Standard** toolbar.

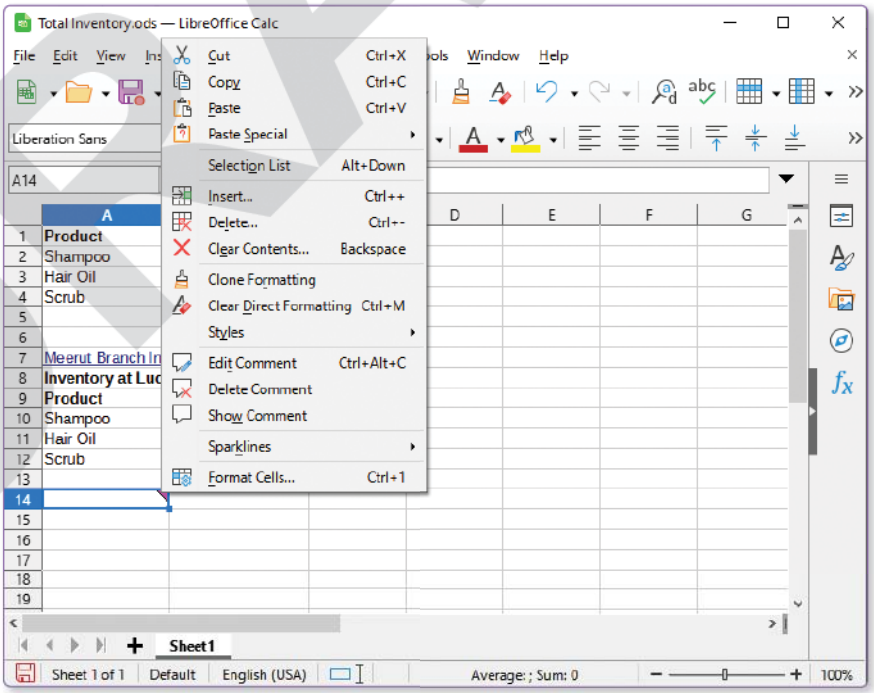
A comment box will be inserted on the top-right corner of the cell. It will have the name of the author or reviewer and date and time of the comment being made. This type of comments is known as notes or suggestions in the spreadsheet.

Step 2: Type the comment, as shown in below figure:



Step 3: Once done click anywhere on the document to activate it.

Once the comment is added in a spreadsheet, you can display, edit or delete it. To perform these operations, right click on the cell where you have inserted the comments select the desired option.



Edit Comment

The steps to edit comment in a spreadsheet are:

Step 1: Select the cell containing comment that you want to edit.

Step 2: Right-click on the selected cell and select the **Edit Comment** option.

It will take you again to the comment text box to make any changes.

Step 3: Modify the comment in the text box.

SHORT KEY

To insert or edit comment in the spreadsheet:

Ctrl + Alt + C

Delete Comment

The steps to delete comment in a spreadsheet are:

Step 1: Select the cell containing comment that you want to delete.

Step 2: Right-click on the selected cell and select the **Delete Comment** option.

The comment from the cell is deleted.

Show or Hide Comment

When comments are visible, you will see all comments displayed on the cells they're associated with. When comments are hidden, the comments would not be displayed, but the indicators will still show which cells have comments attached.

The steps to show comment in a spreadsheet are:

Step 1: Select the cell containing comment that you want to show.

Step 2: Right-click on the selected cell and select the **Show Comment** option from the context menu.

The comment is displayed in the spreadsheet.

You will notice that the Hide Comment option becomes active instead of the Show Comment option. This change occurs because when comments are being displayed, they are already in show mode, which needs to be switched to hide.

The steps to hide comment in a spreadsheet are:

Step 1: Select the cell containing comment that you want to hide.

Step 2: Right-click on the selected cell and select the **Hide Comment** option from the context menu.

The comment is hidden in the spreadsheet.

Format Comment

In LibreOffice Calc, you can format the text within the comment box and as well format the comment box.

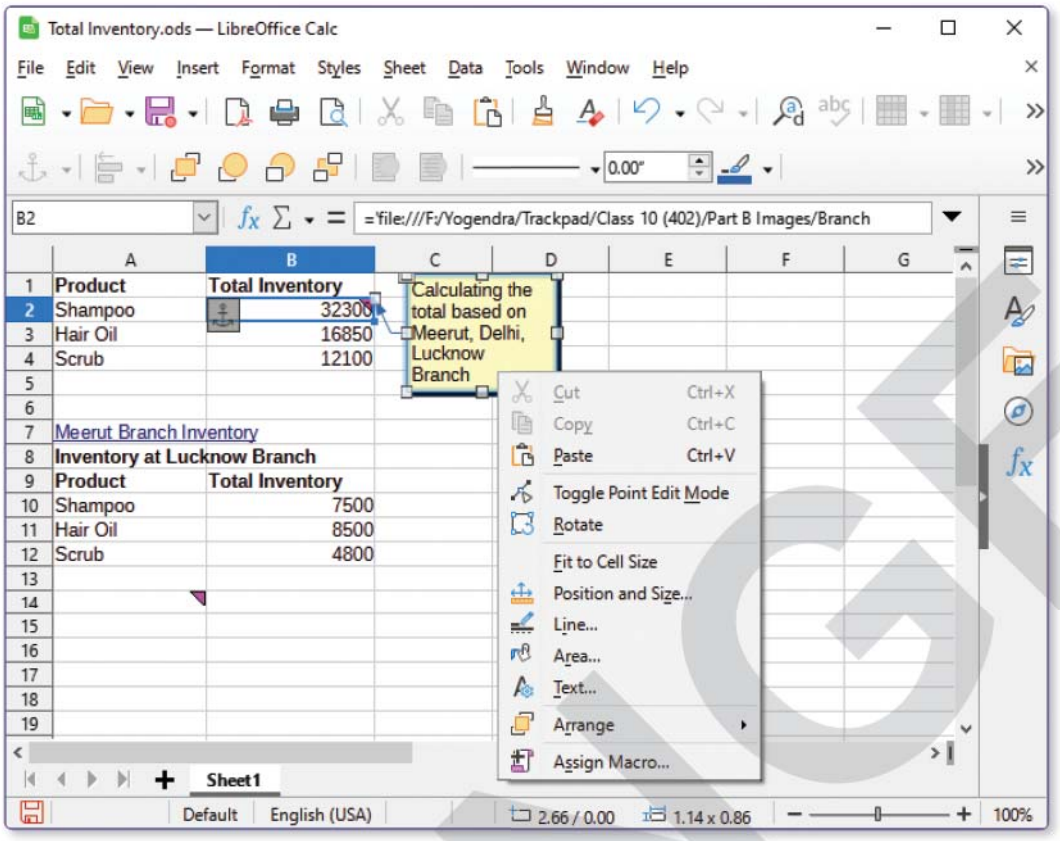
To format the comment, perform the following steps:

Step 1: Select the cell containing comment that you want to format.

Step 2: Right-click on the selected cell and select the **Show Comment** option from the context menu.

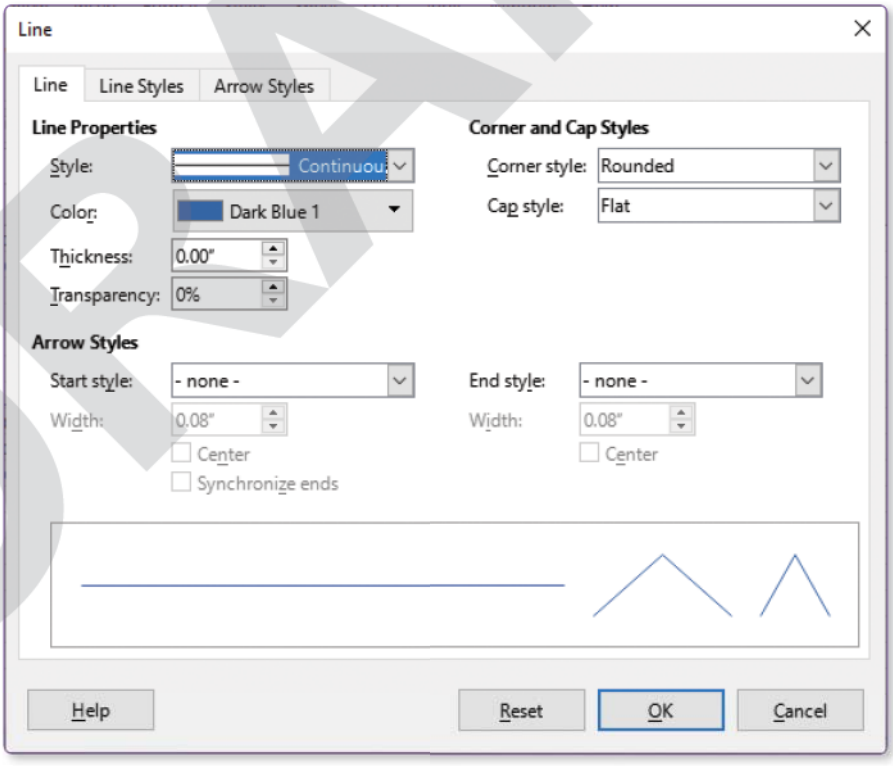
The comment is displayed in the spreadsheet.

Step 3: Right-click on the comment box. A context menu appears that contains the various option for formatting a comment box, such as Line, Area, Positing and Size, etc.



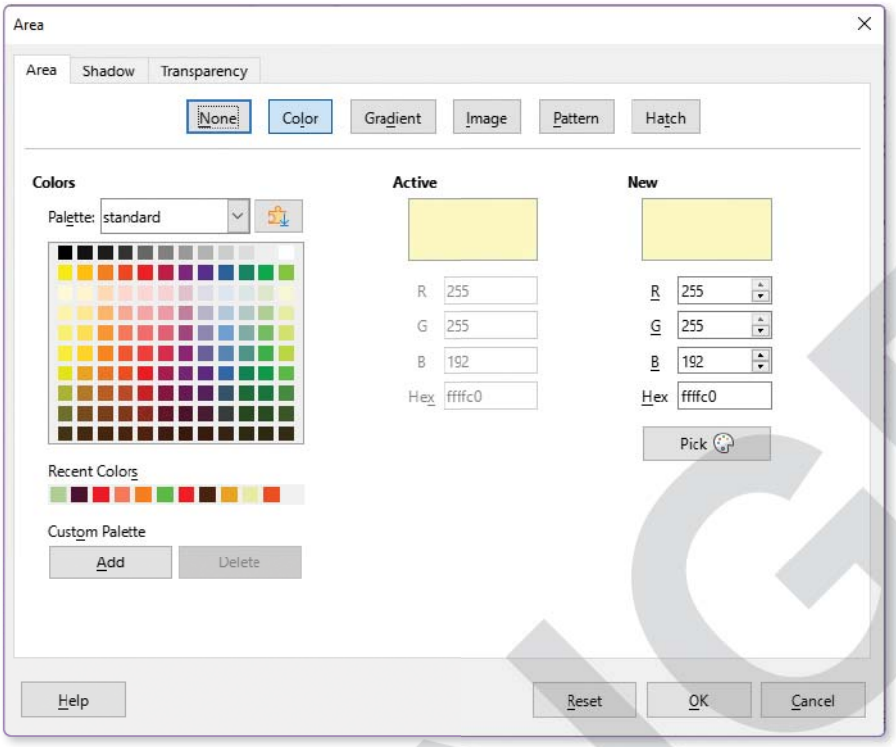
Step 4: Select the **Line** option to change the line style of the comment box. The **Line** dialog box opens.

Step 5: Select the desired option in the respective tab to apply the line related formatting.



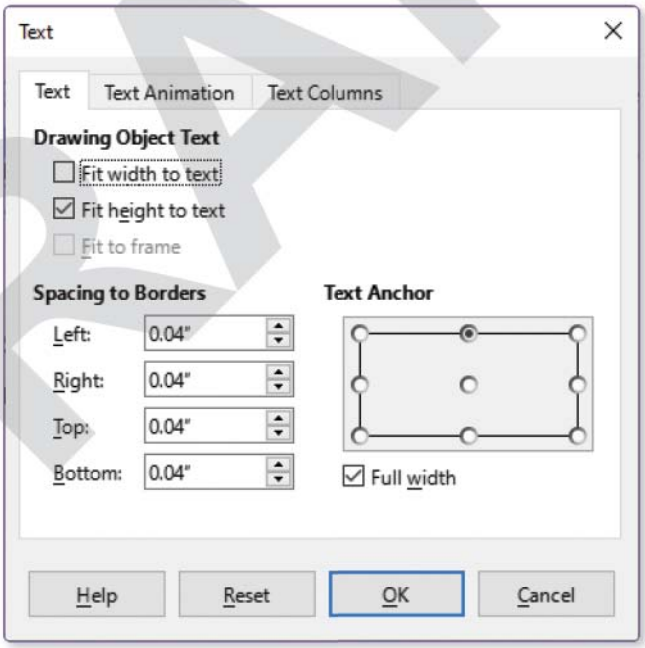
Step 6: Select the **Area** option to change the background, shadow, and transparency of the area of the comment box. The **Area** dialog box opens.

Step 7: Select the desired option in the respective tab to apply the area related formatting.



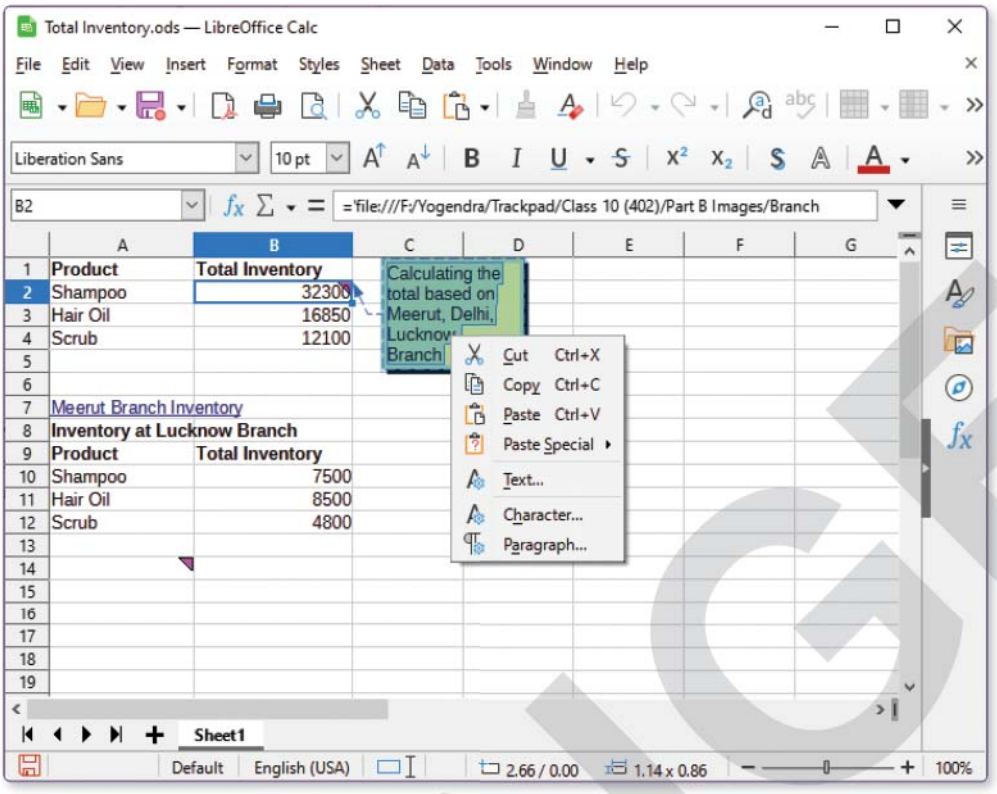
Step 8: Select the **Text** option to change the text position, animation and column in a comment box. The **Text** dialog box opens.

Step 9: Select the desired option in the respective tab to apply the text related formatting.



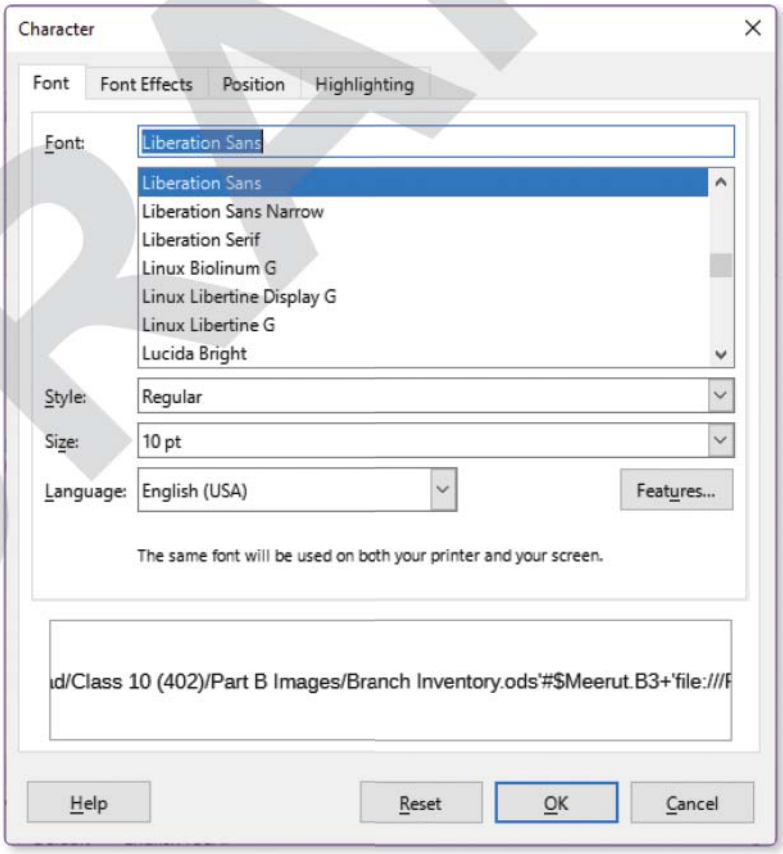
Step 10: Select the text in the comment box.

Step 11: Right-click on the selected text in the comment box. A context menu appears that contains the various option for formatting a text in the comment box, such as Line, Area, Positing and Size, etc.



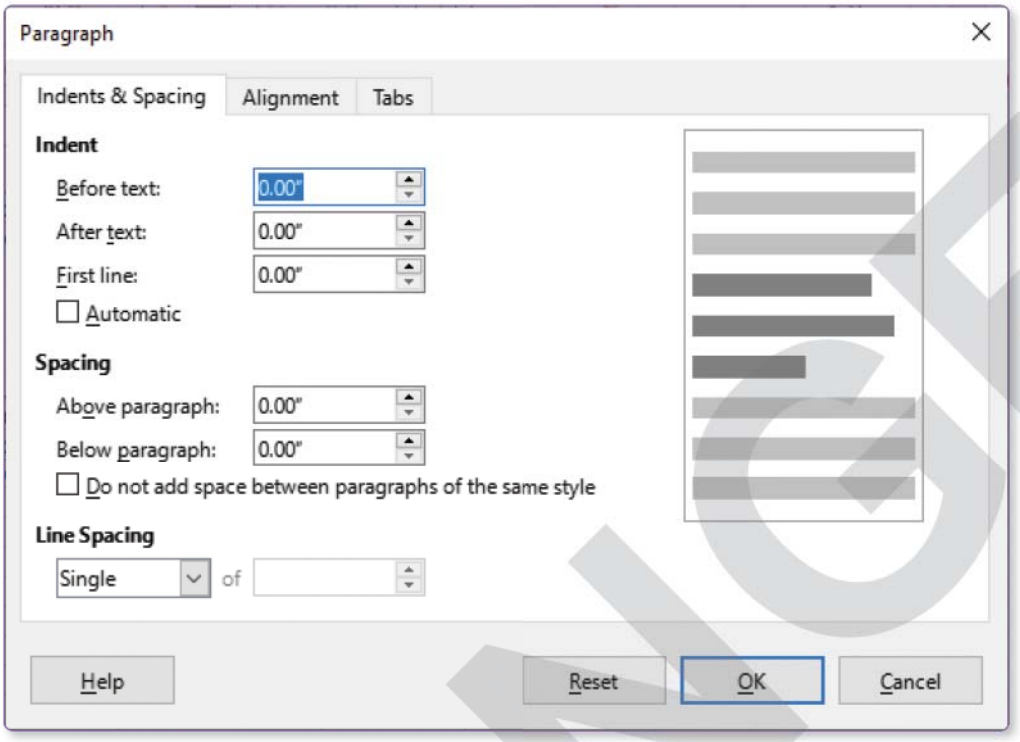
Step 12: Select the **Character** option to change the font colour, font size, font type, font effect, font position, and text highlight of the text in a comment box. The **Character** dialog box opens.

Step 13: Select the desired option in the respective tab to apply the font and character related formatting.

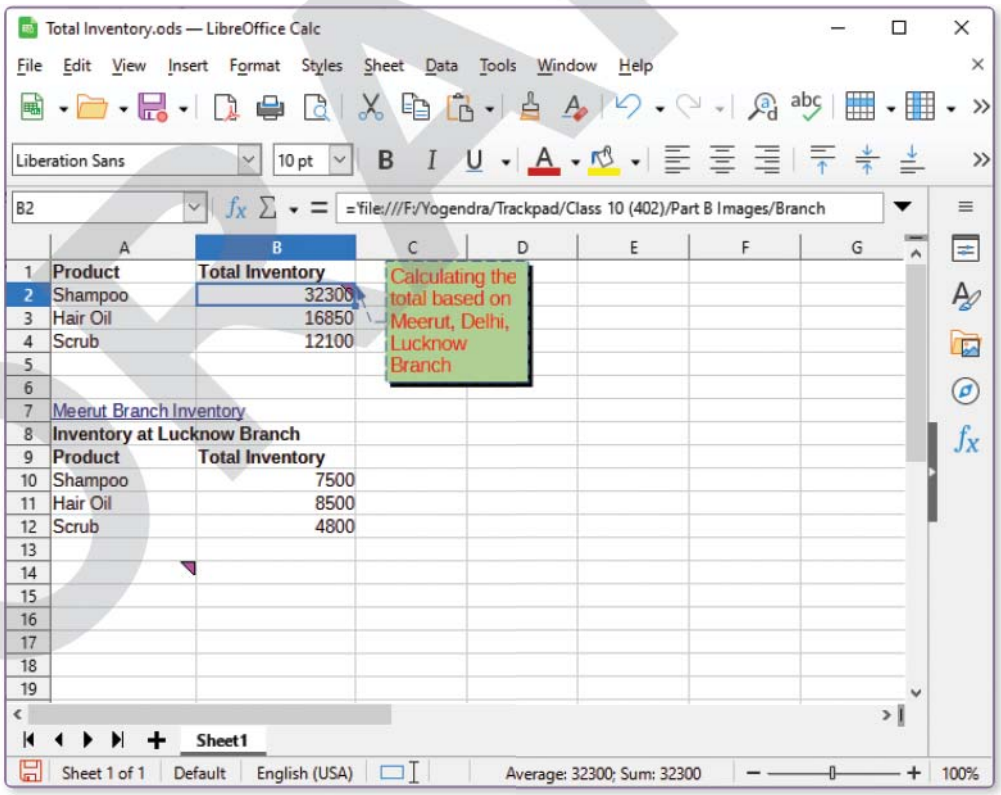


Step 14: Select the **Paragraph** option to change the indentation and spacing, alignment, and tab setting of the paragraph in a comment box. The **Paragraph** dialog box opens.

Step 15: Select the desired option in the respective tab to apply the paragraph related formatting.



Now, the formatted comment is displayed, as shown in below figure:



Quiz Bee

1. After selecting the Merge Documents option which dialogue box opens up.
2. Why do we compare documents?
3. List the benefits of commenting data in spreadsheet.

WHAT ARE MACROS?

Sometimes you need to repeat a few commands very frequently to get the work done. For example, a teacher takes attendance in the class everyday morning by calling out the names. After that she marks the attendance in the computer followed by opening a new mail and forwarding the names of the absentees on a daily basis to higher authorities. Followed by sending a mail to the parents asking them the reason for the absentees. These repeated steps of working in a computer for writing mail and sending to two different categories of people on a daily basis can be made a little faster and less tedious by automating the steps using macros.

This process of saving the sequence of commands or keystrokes by a specific name for the later use is called macros.

The main advantages of using macros are:

- It helps you save time as the long and time consuming tasks are saved as macros and can be executed with a click of a button.
- It saves you from the tedious repetitive tasks.
- The chances of errors in the complex task are reduced.
- You can run a macro as many times as you want until you delete it from the computer.

The Macro keeps track of what you type and click with your keyboard and mouse. But it doesn't record certain things like:

- Opening new windows
- Doing stuff in a different window from where you started recording
- Switching between windows
- Things not about what's in the spreadsheet, like changing settings or organising macros
- It only records when you select things using the keyboard, not the mouse
- The macro recorder only works in Calc and Writer.

Enabling Macro Recording Feature

By default, the macro recording feature is disabled. To use this feature, you need to first enable it. To do this, perform the following steps:

Step 1: Select the **Tools → Options** option in the menu bar.

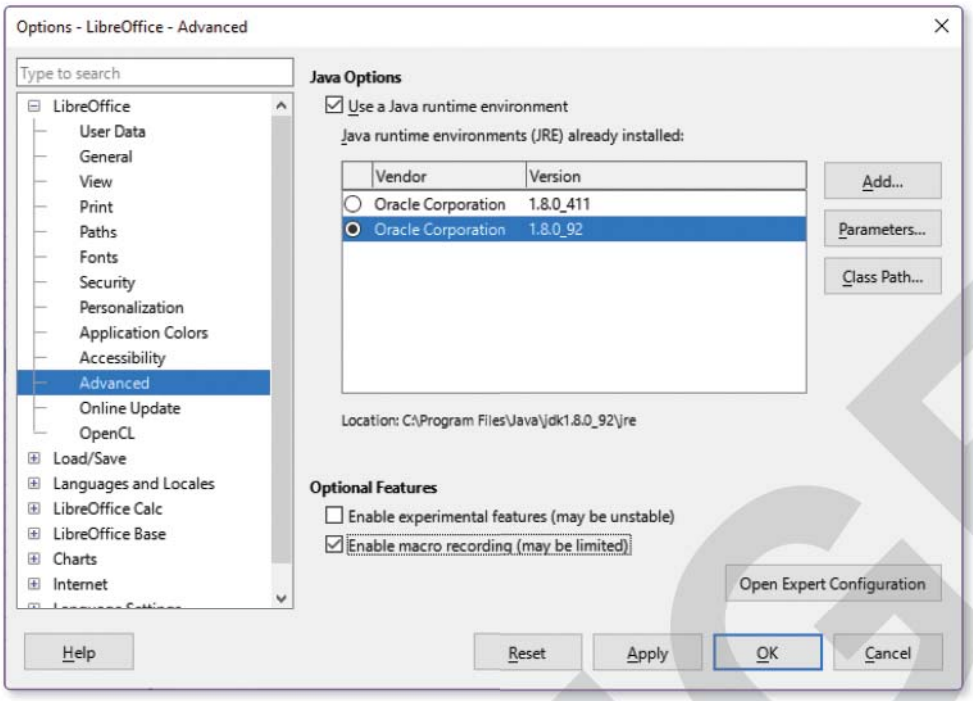
The **Options** dialog box opens.

Step 2: Click on the **LibreOffice** category. The **LibreOffice Base** category expands and displays the options.

Step 3: Select the **Advanced** option. The options related to advance features of LibreOffce displays on the right-side of the **Options** dialog box.

Step 4: Select the **Enable macro recording (may be limited)** check box.

Step 5: Click the **OK** button.



The Macro Recording features is enabled and **Record Macro** option will be visible under **Tools → Macros**.

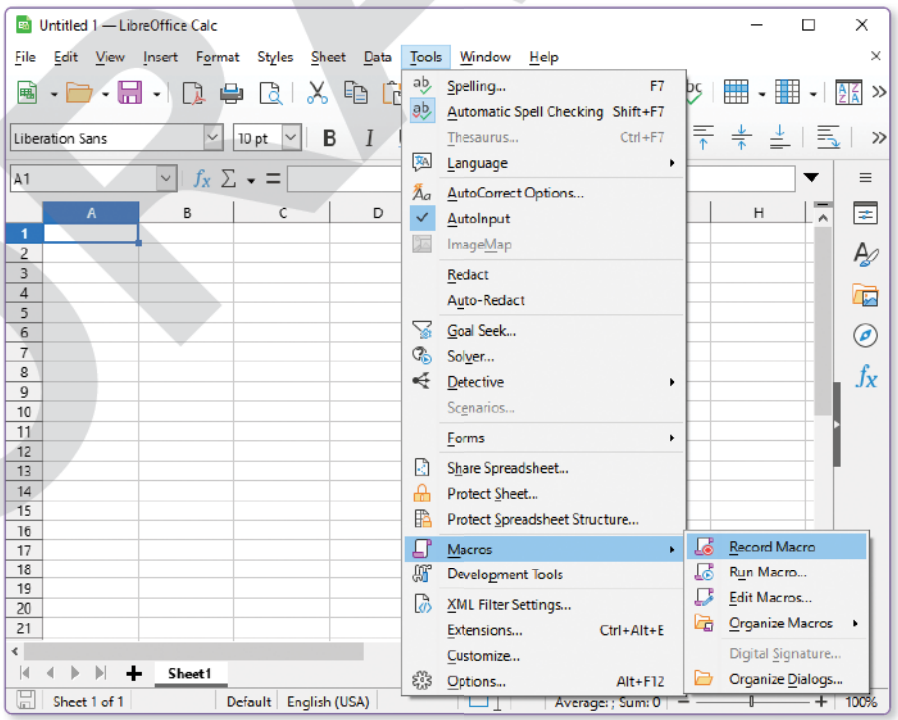
Recording Macros

Let us create a simple macro of storing the names of five cities and formatting it in a different colour, font and size. To do this, follow the steps given below:

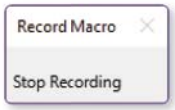
Step 1: Create a new spreadsheet.

Step 2: Select the **Tools → Macros** option from the menu bar.

Step 3: Select the **Record Macro** option from the submenu.

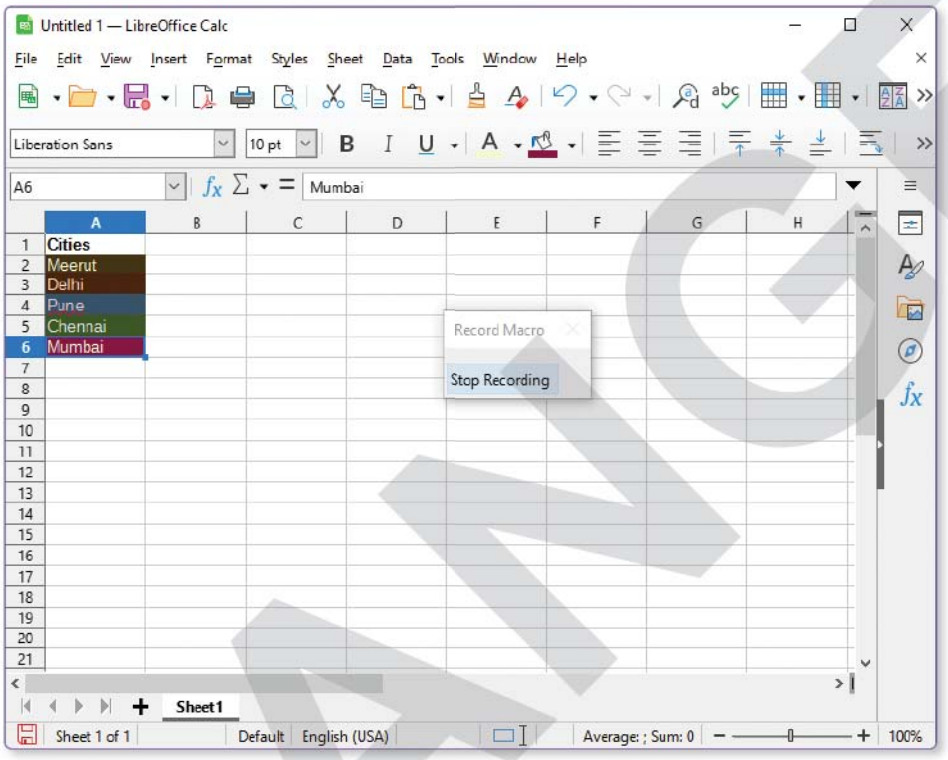


The recording will start immediately. As soon as the record macro becomes active a dialog box of stop recording will be activated as shown below:



Step 4: Add the names of five cities, format the list with different font colours, cell background colour.

Step 5: After you are done with the steps of your formatting the spreadsheet. Click on the **Stop Recording** button.



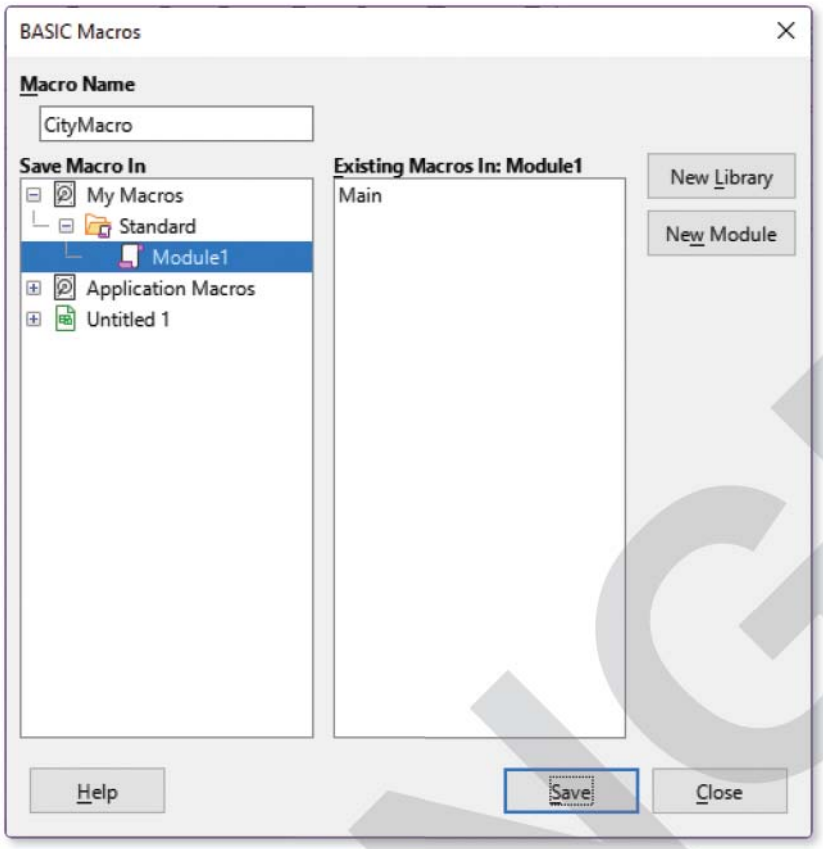
This will open the Basic Macros dialog window to save and run the created macro. This dialog box shows three names in the library, which are as follows:

- LibreOffice gives us a library called LibreOffice Macros is provided by LibreOffice and contains modules with pre recorded macros and should not be changed.
- My Macros is the library where we put the macros we create or add to LibreOffice ourselves.
- "Untitled1" is the default name for a new spreadsheet that we haven't saved yet. Later, when we save the spreadsheet with a new name, "Untitled1" will change to the name we give it.

Step 6: Click on (+) sign in front of **My Macros → Standard → Modules1**.

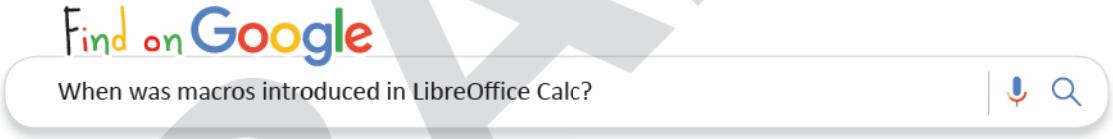
Step 7: The name of the macro by default is Main and is saved in the **Standard** Library in **Module1**. You can change the name of the macro in the **Macro Name** Textbox as "CityMacro". Note that :If all the macros will be given the same name then they will overwrite the previous Macro created by that name.

Step 8: Click on **Save** button.



The macro is saved.

Note that: A Library is a collection of modules which in turn is a collection of macros. A Standard library is present by default when a spreadsheet is created and saved.



Rules for naming a Macro, Module or a Library:

The name must:

- Contain lower case letters (a..z), upper case letters (A..Z), digits (0..9) or underscore.
- Begin with a letter or an underscore.
- Not contain any other spaces, punctuation symbols, or special characters.

Running a Macro

After the macro is recorded, you can run it as many times as you want until you delete it from the computer. The steps to run a macro are as follows:

Step 1: Create a new spreadsheet or open an existing spreadsheet where you want to run a macro.

Step 2: Select the **Tools → Macros** option from the menu bar.

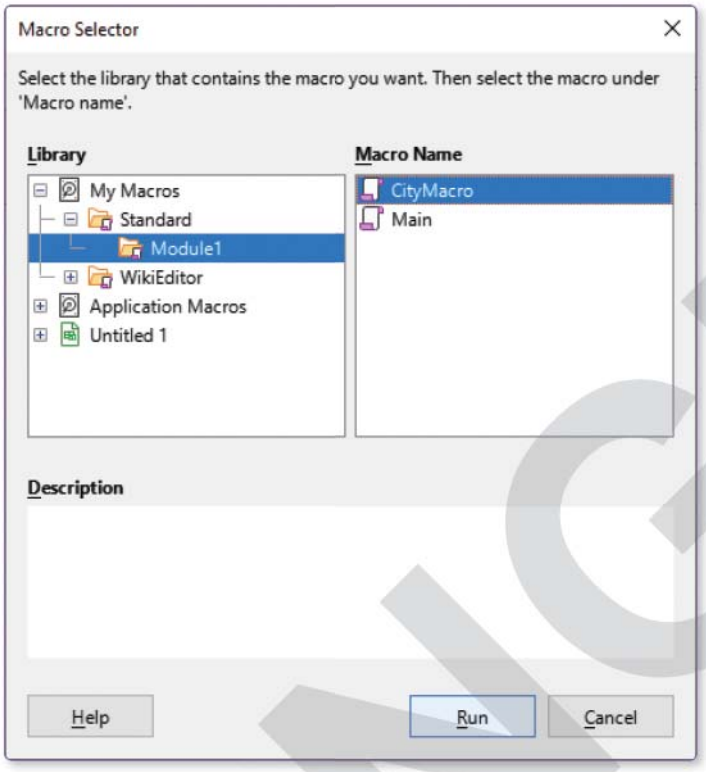
Step 3: Select the **Run Macro** option from the submenu.

The **Macro Selector** dialog box opens.

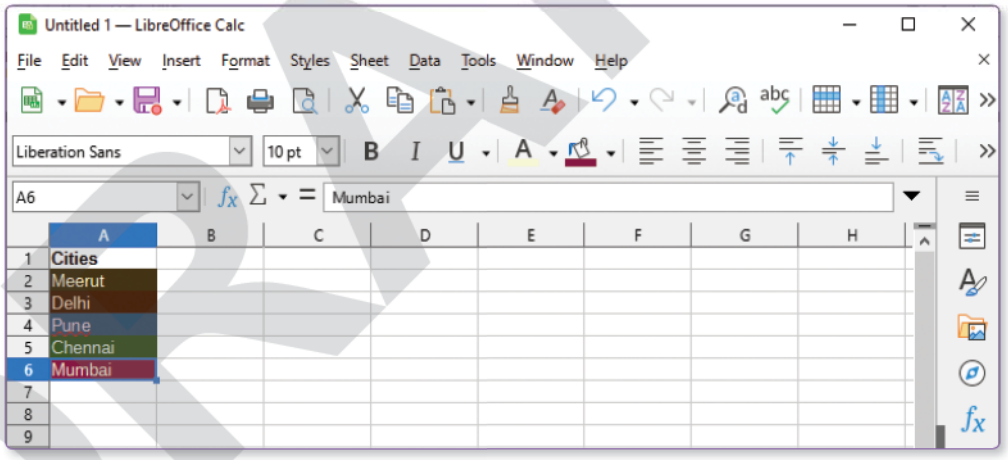
Step 4: Open the folders by clicking on (+) sign in front of My **Macros** → **Standard** → **Module1**. The list of macros within it will be displayed.

Step 5: Select the **CityMacro** macro.

Step 6: Click on the **Run** button, as shown in below figure:



The macro runs in the spreadsheet.



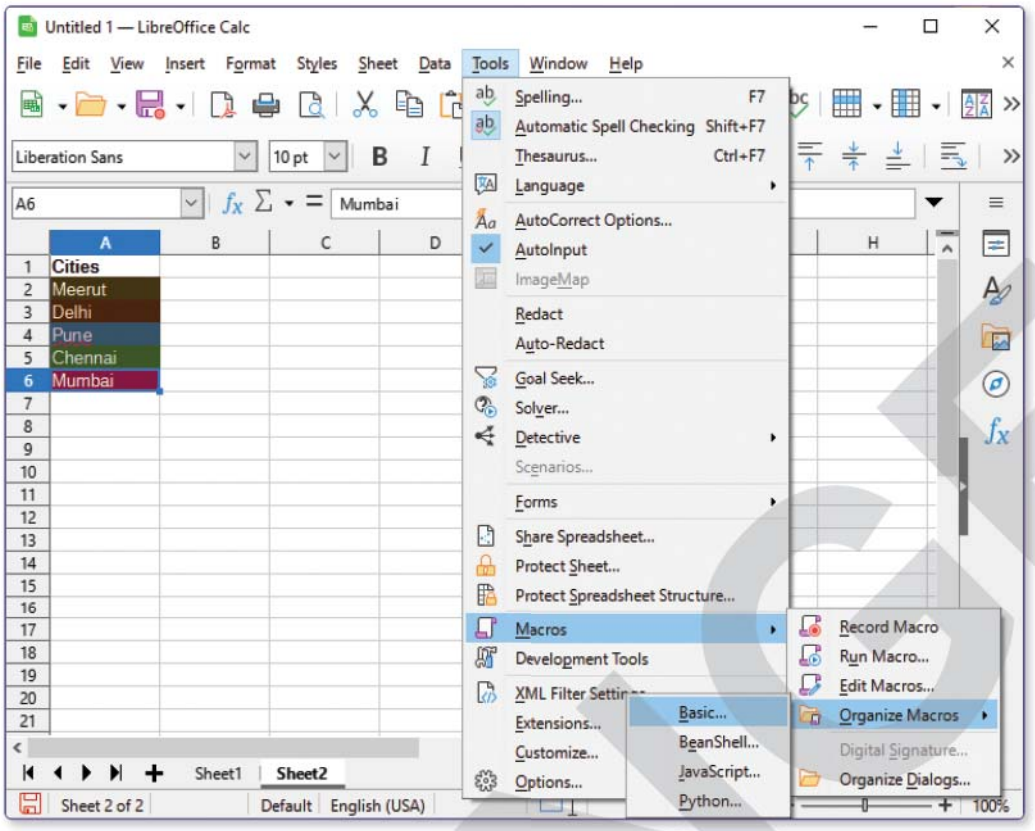
Organising a Macro

So far, we've figured out how to record, save, and use macros. When we record a macro, it's saved as a set of instructions in a programming language. These instructions are carried out when we run the macro. When we record a macro, we choose where to store it. We can either create a new storage place (like a library or module) or use an existing one.

The steps to organise a macro are as follows:

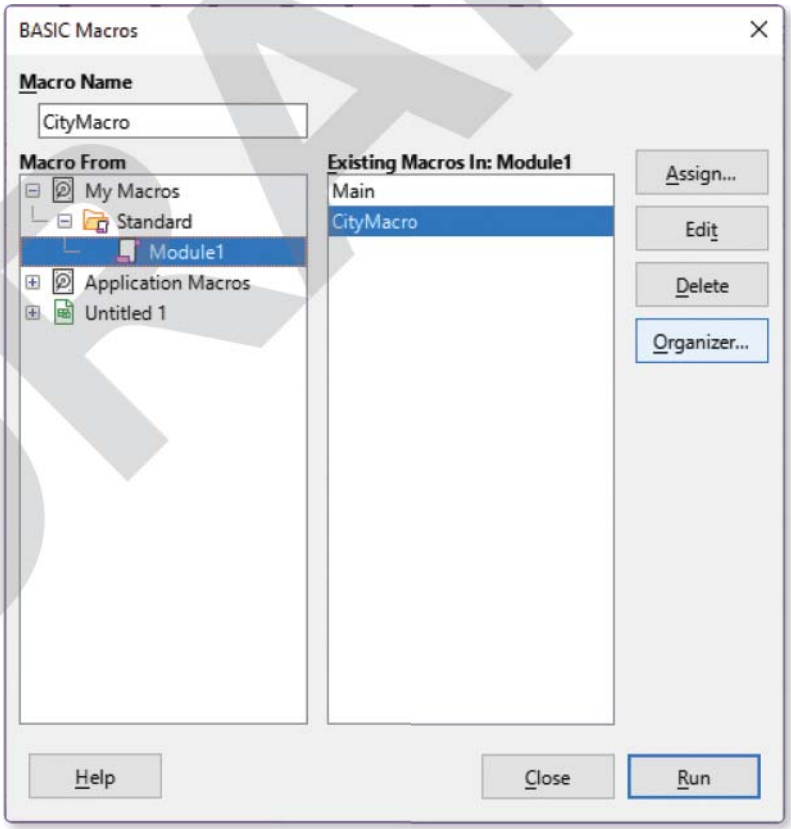
Step 1: Select the **Tools → Macros** option from the menu bar.

Step 2: Select the **Organise Macros → Basic...** option from the submenu.

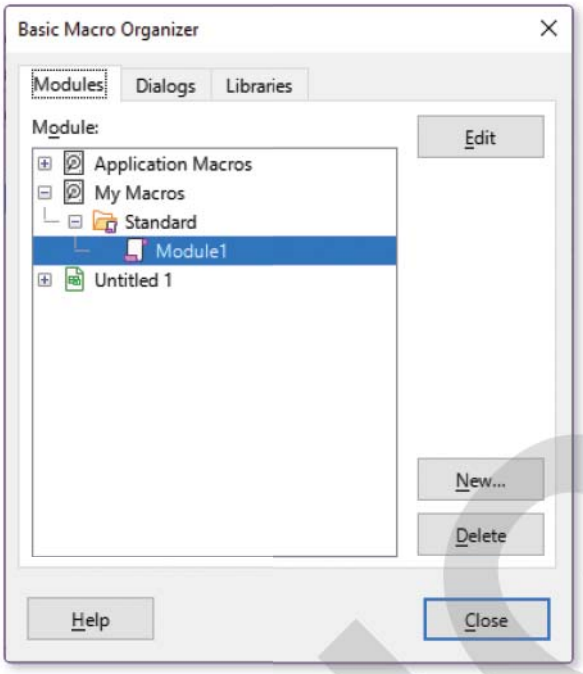


The **BASIC Macro** dialog box opens.

Step 3: Click the **Organiser** button.



The **Basic Macro Organiser** dialog box opens.



This **Basic Macro Organiser** dialog box allows you to edit and delete an existing library as well as create a new library.

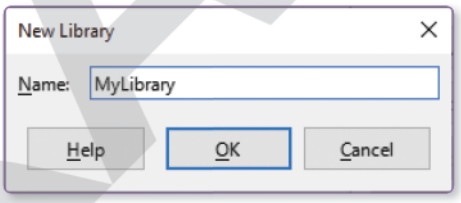
The steps to create a new library are as follows:

Step 1: Click the **Libraries** tab in the **Basic Macro Organiser** dialog box.

Step 2: Click the **New** button. The **New Library** dialog box opens.

Step 3: Type the name of the library in the **Name** text box.

Step 4: Click the **Ok** button.



The new library is created.

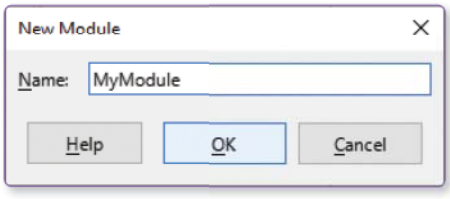
The steps to create a new module are as follows:

Step 1: Click the **Modules** tab in the **Basic Macro Organiser** dialog box.

Step 2: Click the **New** button. The **New Module** dialog box opens.

Step 3: Type the name of the module in the **Name** text box.

Step 4: Click the **Ok** button.



The new module is created.

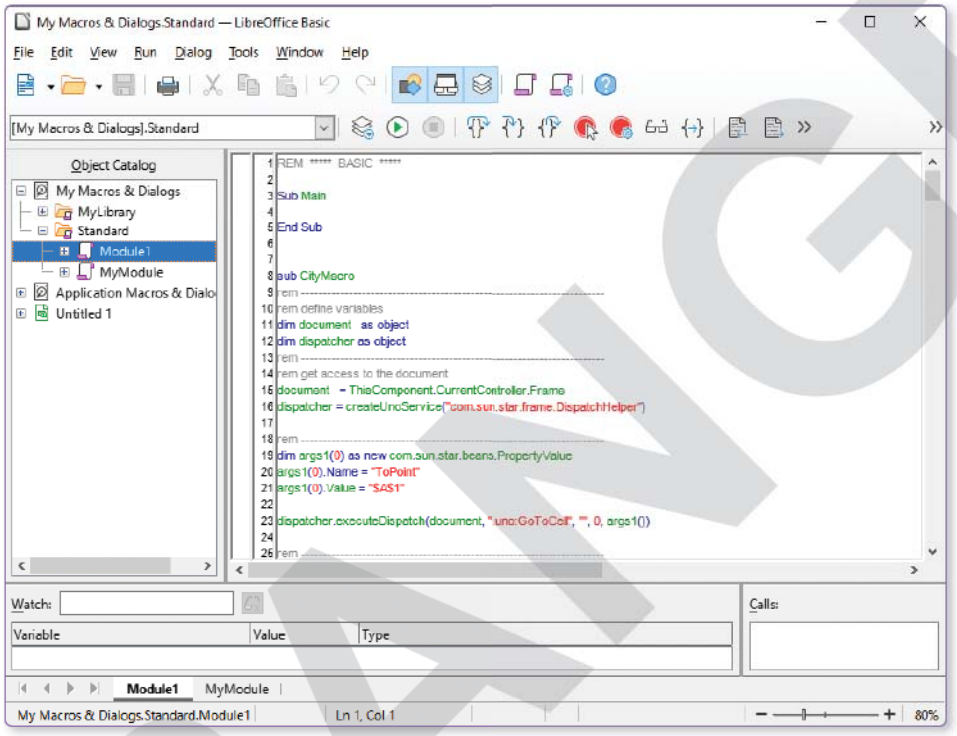
Access the Code Window of a Macro

Whenever a macro is created the code generated equivalent to the instructions given in a recorded macro are stored internally in LibreOffice Calc in a programming language called BASIC. It is also possible to view and thus edit the code of a macro, if you have knowledge of BASIC. You can view the code generated for the macros by following the given step:.

Step 1: Select the **Tools → Macros** option from the menu bar.

Step 2: Select the **Organise Macros → Edit Macros** option from the submenu.

This will open a code window as shown below:



You will see that the code begins with **sub** followed by a macro name and ends with **End Sub**.

Using a Macro as a Function

In LibreOffice Calc, macros can be used to create user defined functions. Functions created using macros are not case sensitive. The steps to create a simple macro function are as follows:

Step 1: Create a new spreadsheet.

Step 2: Select the **Tools → Macros** option from the menu bar.

Step 3: Select the **Organise Macros → Edit Macros** option from the submenu.

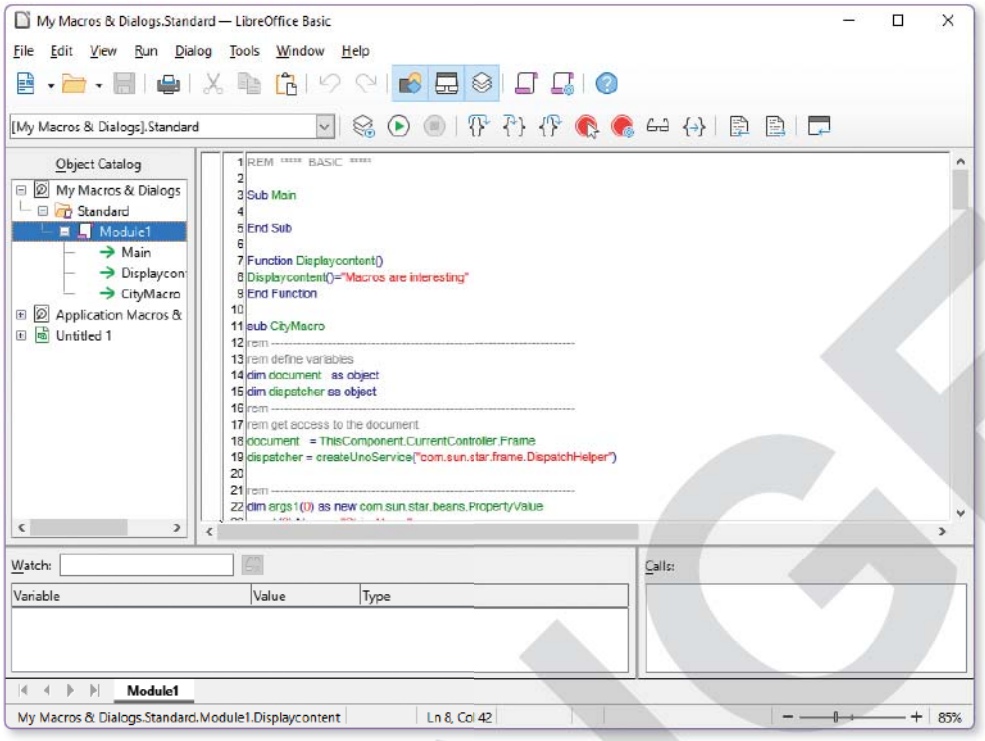
The **Macro** code window opens.

Step 4: Create an empty line after **Sub main** and **End Sub**. Write the given code:

```
Function Displaycontent()
Displaycontent()=”Macros are interesting”
End Function
```

The code window after the given code is entered.

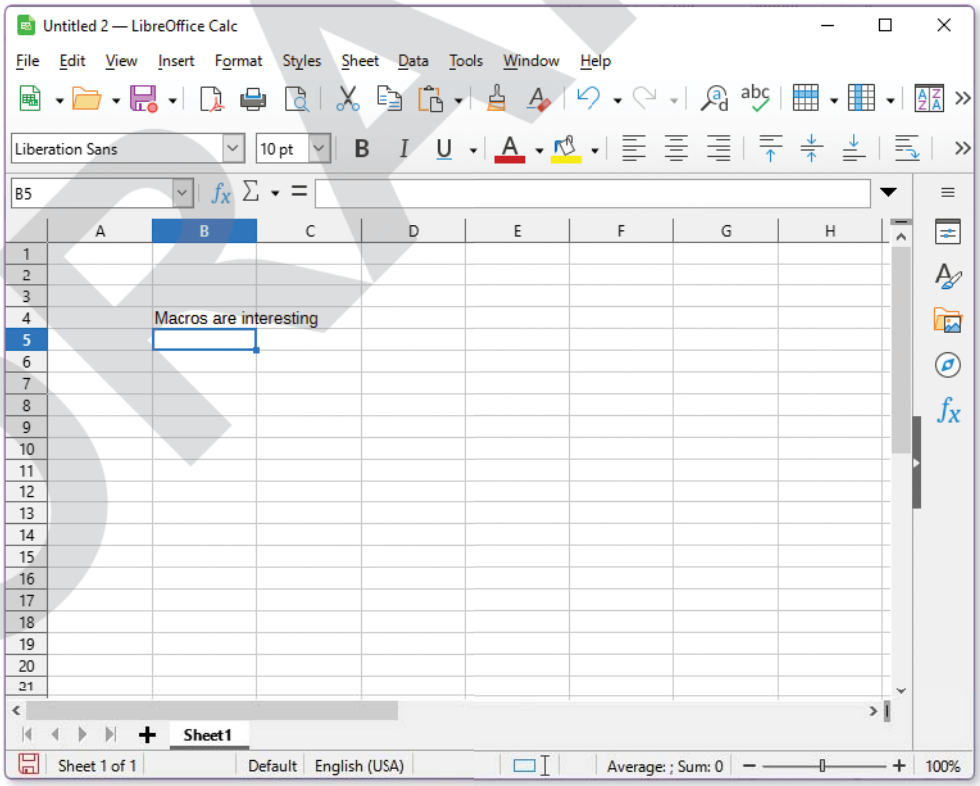
Step 5: Press **Ctrl+S** or click on **Save** button on the Standard toolbar to save the changes in the code window.



Step 6: Close the code window.

Step 7: Now, when we type **=Displaycontent()** in any cell in the sheet.

Then, you will see the text **Macros are interesting** displayed automatically in a cell as shown below:



Passing Arguments to Functions created Using Macros

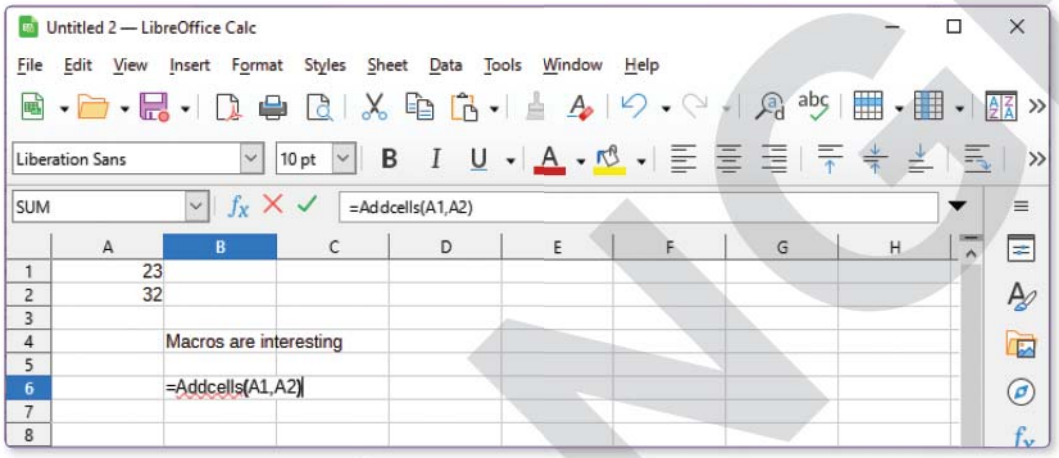
The values written within the circular brackets of the function are called arguments. These arguments are created to pass as values to the functions.

Let us create a function to add two cells:

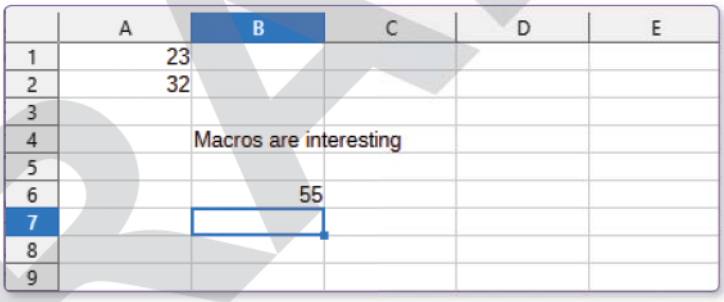
```
Function Addcells(a, b)

Addcells=a+b

End Function
```

In the above code a, b written within Addcells() are two arguments which are passed as values.

Now, enter 23 in cell A1 and 32 in cell A2 and then, type **=Addcells(A1, A2)** in any cell in the sheet.



As soon as you press enter key you will see the total as 55.



Passing the Arguments as Values

Values are always supplied as arguments from Calc to a macro. The cells that are used, if any, are unknown. For instance, when =PositiveSum(C7) passes cell C7's value, PositiveSum is unaware that cell C7 was utilised. If you need to know the values in the cells rather than the referenced cells, pass the range as a string, parse the string, and get the values in the cells that are referenced.

Macros to Work like Built-in Functions

Macros do not actually behave like built-in functions, even if Calc detects and calls them like regular functions. For instance, the function lists do not contain macros. By creating an Add-In, functions may be written that operate similar to built-in functions.

Accessing Cells Directly

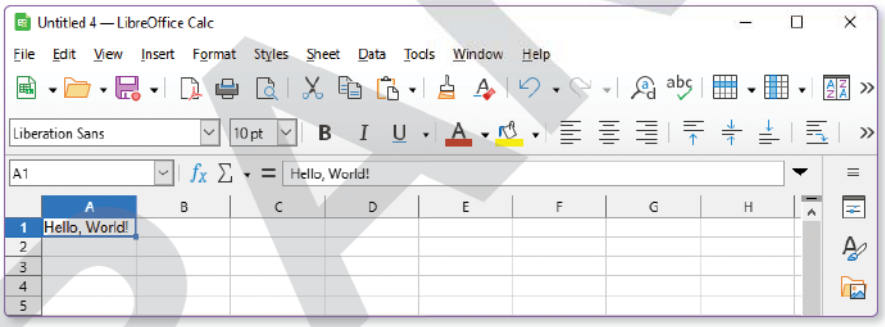
In LibreOffice Calc, you can use macros to directly access and manipulate cells. This means you can write instructions to perform actions like changing the content of a cell, formatting cells, or performing calculations.

For example, if you want to sets the content of cell A1 in the active spreadsheet to "Hello, World!".

```
Sub SetCellValue()
    Dim oSheet As Object
    Dim oCell As Object
    ' Get the active sheet
    oSheet = ThisComponent.CurrentController.ActiveSheet
    ' Get the cell A1
    oCell = oSheet.getCellRangeByName("A1")
    ' Set the value of the cell
    oCell.String = "Hello, World!"
End Sub
```

In the give function, the `ThisComponent.CurrentController.ActiveSheet` is used to access the current sheet and `getCellRangeByName("A1")` retrieves the cell with the specified name "A1" from the current spreadsheet.

When you run the **SetCellValue** macro, you should see that cell A1 now contains the text **Hello, World!**.



Sorting a Column Using a Macro

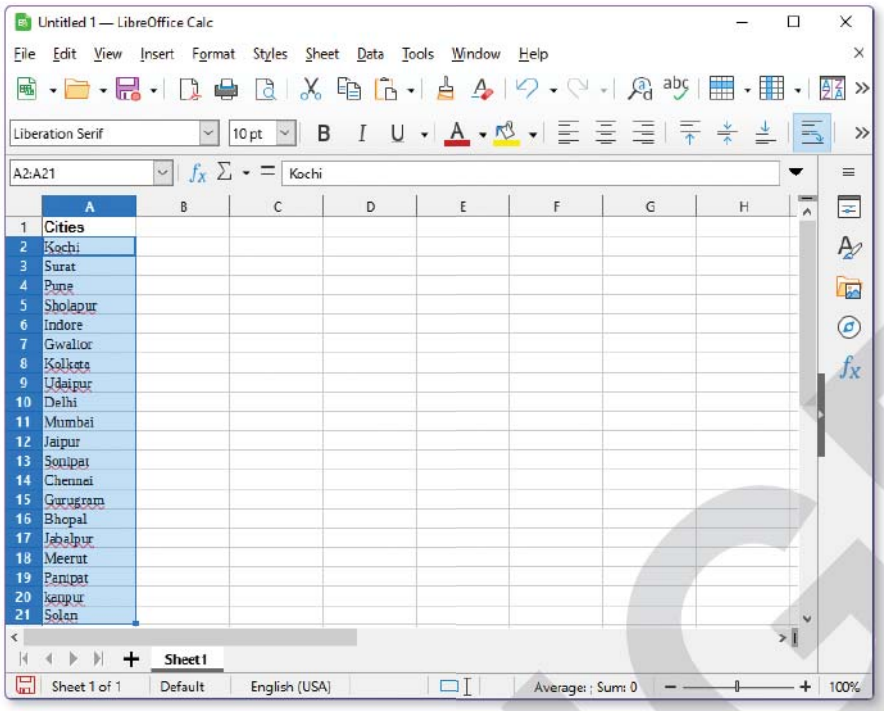
Sorting means arranging the data in the ascending or descending order. To sort data in a spreadsheet select the range of cells and click on Data → Sort.

These steps to sort a specific range of cells can be stored in a macro. So that next time if you wish to sort the data in any of the sheets you just have to run the macro and the sorting will be done automatically. Take care that the range of cells used at the time of creating a macro are matching with the range of cells you wish to sort using a macro. For example, you created the macro for range B5:B20 will cover 16 consecutive cells. So at the time of using the macro total 16 consecutive cells should be selected to run the macro otherwise it will not work and data will not be sorted.

Let us take the example of the given name of the cites to be sorted in the ascending order by creating a macro as shown below:

Step 1: Create a spreadsheet with the given list of the cities in cell A1:A21.

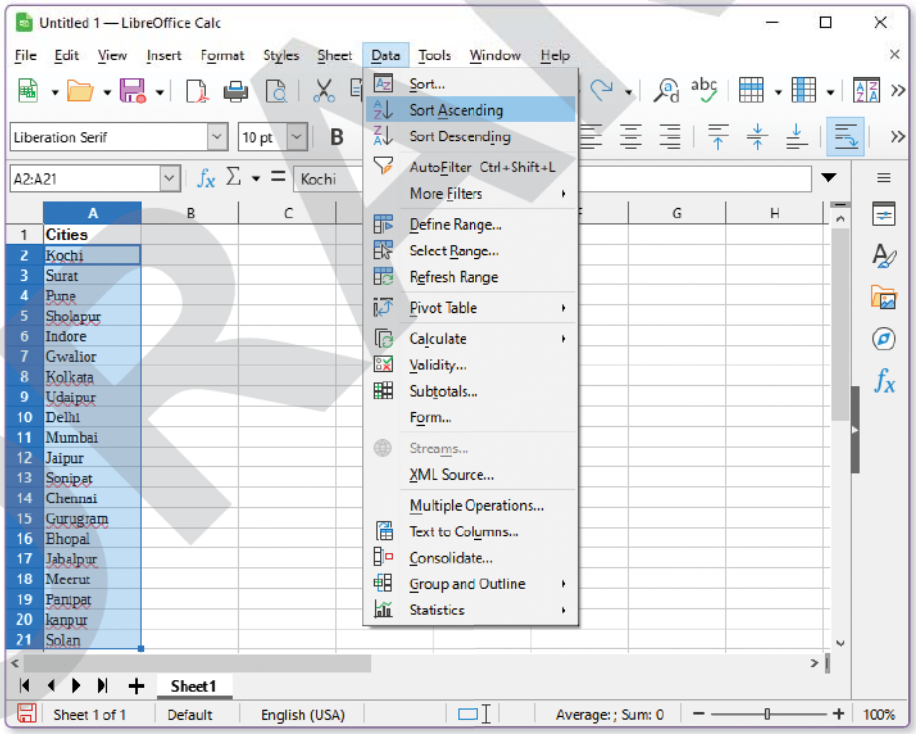
Step 2: Select the range **A2:A21**.



Step 3: Select the **Tools → Macros** option from the menu bar.

Step 4: Select the **Record Macro** option from the submenu.

Step 5: Click on **Data → Sort Ascending** option from the menu bar.

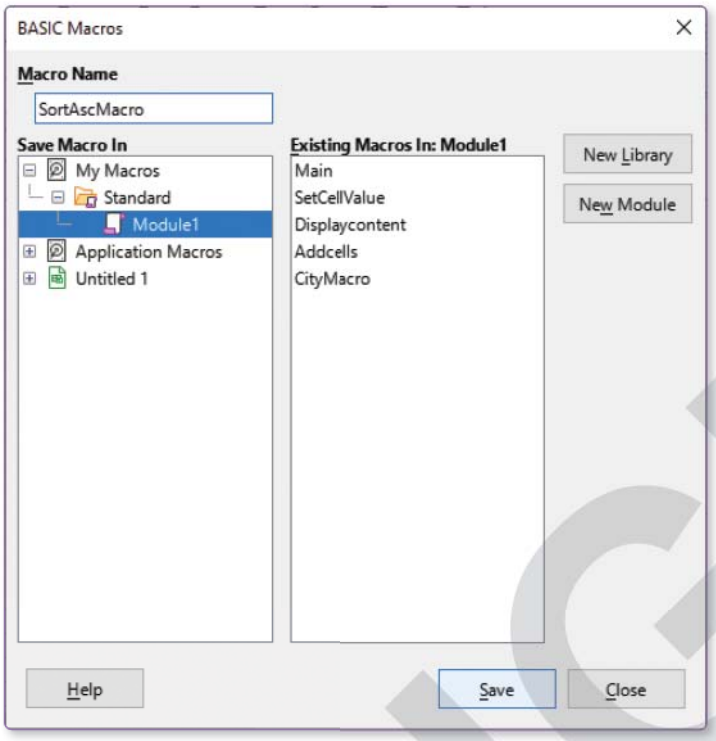


The data is arranged in the ascending order.

Step 6: Click on the **Stop Recording** button.

Step 7: Specify the name for this new macro as **SortAscMacro**.

Step 8: Click on **Save** button.



Step 9: Add new sheet **Sheet 2** and enter 25 numbers in random order.

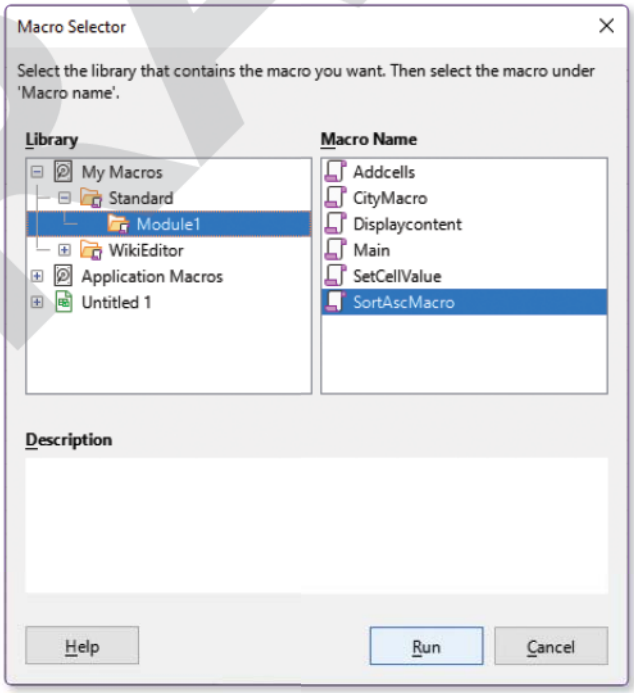
Step 10: Select the **Tools → Macros** option from the menu bar.

Step 11: Select the **Run Macro** option from the submenu.

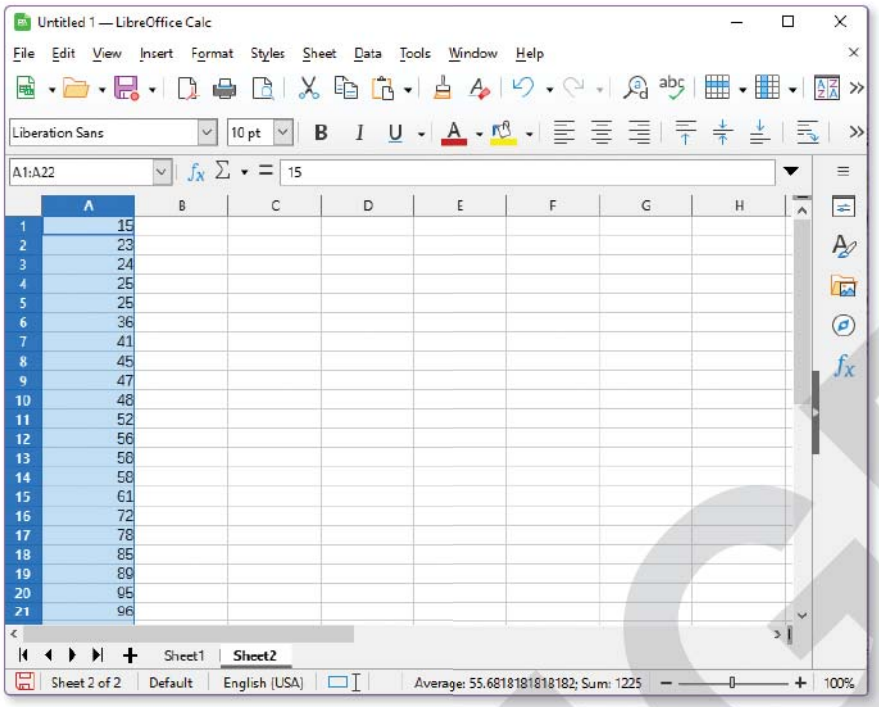
The **Macro Selector** dialog box opens.

Step 12: Select the **SortAscMacro** macro that you want to run.

Step 13: Click on **Run** button.



The **SortAscMacro** macro will be executed and the sorts the numbers in the ascending order.



REVISIT

- Data analysis helps organisations in various tasks such as informed decision-making, problem-solving, understanding customer behaviour, improving efficiency, performance evaluation, and risk management.
- Data consolidation refers to the process of combining data from multiple sheets of the spreadsheet into a single sheet by using different built-in functions.
- Groups and Subtotals is a feature that allows users to organise and summarise data within spreadsheets.
- The Subtotal tool in Calc creates the group automatically and applies common functions like sum, average on the grouped data.
- A What-if scenario is a collection of values applicable for calculations in a spreadsheet.
- One-input What-If analysis allows you to examine how changes in a single input variable impact the outcome of a formula or calculation.
- Two-input What-If analysis extends this concept to explore the effects of changes in two input variables on the outcome of a formula or calculation.
- Goal Seek is a tool used to find the input value required to achieve a desired outcome in a formula.
- Solver helps you find out the best possible combinations of the multiple variable values for the maximum or minimum desired result.
- Linking the sheets is done to access data present in the different sheets of the same spreadsheet or in different spreadsheets.
- Hyperlink is a feature that allows you to jump to a different location from within a spreadsheet.
- Sharing a spreadsheet refers to the way of allowing multiple users to access and work together on the same document simultaneously.
- Comments in spreadsheets serve the purpose of providing additional information, context, or explanations about specific data or formulas within the spreadsheet.
- This process of saving the sequence of commands or keystrokes by a specific name for the later use is called macros.

Solved

SECTION A (Objective Type Questions)

A. Choose the correct option.

1. Data available in other sheets in a workbook, can be consolidate by _____ .
   a. Row label
   b. Column Label
   c. Both a & b
   d. None of the mentioned
2. What all operations can we perform using data consolidation?
   a. Max
   b. Min
   c. Average
   d. All of the above
3. _____ analysis tool works in reverse order, finding input based on the output.
   a. Consolidate function
   b. Goal seek
   c. What-if analysis
   d. Scenario
4. Goal seek is a _____ Tool.
   a. Comparison
   b. What-if analysis
   c. consolidate
   d. Additional
5. To refer a cell from another worksheet, use worksheet number followed by sign and cell address.
   a. colon followed by dollar
   b. comma followed by dollar
   c. period followed by dollar
   d. hash followed by dollar
6. Which function cannot be performed through Subtotal in a Spreadsheet? [CBSE Sample Paper 2022]
   a. Sum
   b. Product
   c. Average
   d. Percentage
7. Which type of questions are tested by using the Scenarios?
   a. Auto
   b. Short
   c. What-if
   d. Long
8. It refers to a cell or a range of cells on a worksheet and can be used to find the values or data that you want formula to calculate. [CBSE Sample Paper 2022]
   a. Row
   b. Column
   c. Autosum
   d. Cell Reference
9. Which of the following is more elaborate form of Goal Seek? [CBSE Sample Paper 2022]
   a. Subtotal
   b. Scenario
   c. Solver
   d. Consolidate
10. _____ means combining data in a spreadsheet from different worksheets into master worksheet. [CBSE Sample Paper 2022]
    a. Hyperlinks
    b. Consolidating
    c. Linking
    d. Filter
11. Which of the following is the correct step to record changes?
    a. Edit → Track Changes → Record
    b. File → Track Changes → Record Changes
    c. Tools → Track Changes → Record Changes
    d. Data → Track Changes → Record Changes
12. Which of the following menu contains the Subtotal option?
    a. File
    b. Data
    c. Tools
    d. Insert

13. Which of the following is not an example of cell referencing?
    a. A1:B6 b. G6
    c. C10:C20 d. 7Q
14. Which of the following is not present in the Insert Sheet dialog box?
    a. Before current sheet b. After current sheet
    c. New Sheet d. Create
15. Which of the following options is used to share a worksheet?
    a. Share Document b. Share Worksheet
    c. Share d. None of these

Ans. 1. c 2. d 3. b 4. b 5. d 6. d 7. c 8. d 9. c 10. b 11. a 12. b 13. d 14. d 15. a

B. Fill in the blanks.

1. _____ and _____ are some of the important data analysis tools available in LibreOffice spreadsheet.
2. Groupwise calculation of sum, average, max, min, count etc. can be done by using the _____ option of LibreOffice Calc.
3. _____ are what-if analysis tools of LibreOffice Calc that helps you set multiple values for the same cell.
4. _____ tool helps you do backward calculation of the input to obtain the desired output.
5. Macros are present in _____ menu.
6. Comments option is present under the _____ menu.
7. _____ refers to the process of combining data from multiple sheets of the spreadsheet into a single sheet.
8. A _____ saves you from the tedious repetitive tasks.
9. The Run Macro option under the _____ menu is used to run a macro.
10. The values written within the circular brackets of the function are called _____ .

Ans: 1. Data consolidation and Goal Seek 2. Subtotal 3. Scenarios 4. Goal Seek 5. Tools
6. Insert 7. Data consolidation 8. Macro 9. Tools
10. Arguments

C. State whether these statements are true or false:

1. Renaming a sheet can also be done using Tools Menu. _____
2. Relative hyperlink contains a full URL. _____
3. Filter feature is used to extract data using some conditions on columns. _____
4. Macros do not simplify the task of a user. _____
5. Link to source data is checked updates the target sheet if any changes made in the source data. _____
6. A Macro helps you save time as the long and time consuming tasks are saved as macros and can be executed with a click of a button. _____
7. What-if analysis tool uses only one array of cells. _____
8. Compare Document option is used to merge two worksheets. _____
9. Data found in the edited version but not in the original is marked as inserted. _____
10. The Range option allows to show the changes made in the specified range of cells. _____

Ans. 1. False 2. False 3. True 4. True 5. True 6. True 7. False 8. False 9. True 10. True

SECTION B (Subjective Type Questions)

A. Short answer type questions:

1. What is Data Consolidation? Why do we need Data consolidation?

Ans. Data consolidation refers to the process of combining data from multiple sheets of the spreadsheet into a single sheet by using different built-in functions like sum(), max(), min(), average(), etc.

2. What is the advantage of using cell reference?

Ans. The main advantage of using cell reference is that it can be used in formulas and functions. This helps you update the result of a function or a formula automatically if the value in a particular cell used in a formula changes.

3. How do you keep a track of the changes made in a spreadsheet?

Ans. LibreOffice Calc allows you to keep a track of the changes made in a document using the **Edit → Track Changes → Record** option.

4. How do you view the changes made using Record option?

Ans. Click on Edit → Track Changes → Show option.

5. What is the purpose of sharing a spreadsheet?

Ans. Sharing a spreadsheet refers to the way of allowing multiple users to access and work together on the same document simultaneously.

6. What is What-if scenario?

Ans. A What-if scenario is a collection of values applicable for calculations in a spreadsheet. In LibreOffice Calc, multiple scenarios can create on a single sheet. Each scenario is assigned a name and a formatting style.

7. Mention any four options present in the Create Scenario dialog box.

Ans. Name of Scenario, Display border, Copy back, and Prevent changes.

8. What is the use of Goal Seek feature?

Ans. Goal Seek is a tool used to find the input value required to achieve a desired outcome in a formula. It allows you to set a target value for a cell and then adjust the value of another cell until the target value is achieved.

9. What are relative hyperlinks?

Ans. Relative Hyperlink refers to reaching the linked document with respect to the current location. It will include the partial cell address in hyperlink. If the start and target locations change relative to each other, then relative hyperlink will not work.

10. List the names of the options present in the External Data dialog box while linking a worksheet with external data.

Ans.
- URL of External Data Source
- Available Tables/Ranges
- Update every

B. Long answer type questions:

1. Explain any three options present in the Create Scenario dialog box?

Ans. **Name of the Scenario:** Has the default name as Sheet1_Scenario_1. Change it to a relevant name that clearly identifies a scenario in the drop-down list and in the Navigator window.

Comment: It is optional and is the extra information required. When you select the scenarios then this information is displayed in the Navigator.

Settings: It has several options where the settings can be changed as per the situations.

2. What is the purpose of adding comments? Give steps to add comments.

Ans. Comments increase the readability of the cells by giving the information about the changes made in a shared document. The steps are:

Step 1: Click on **Edit → Track Changes → Comments** from the menu bar.

Step 2: In the dialog box that appears → In the **Text** - Type your own comment.

Step 3: Click on **OK** button.

3. What do you understand by hyperlink? Also, explain its types.

Ans. In LibreOffice Calc, a hyperlink is a feature that allows you to create clickable links within a spreadsheet. When users click on the hyperlink, Calc will navigate to the specified destination, whether it's another location within the spreadsheet, a file on the computer, or a website on the internet.

Hyperlinks in Calc can be edited or removed by selecting the cell containing the hyperlink and then using the appropriate options by using the context menu.

Hyperlinks helps you to:

- Move to a specific cell within the current spreadsheet.
- Move to a specific location in another file. This file can be a spreadsheet, document, or any other file.
- Accessing a specific website.
- Sending an email to a specific address.
- Creating a new file.

Hyperlinks in a spreadsheet are of two types which are as follows:

- **Relative Hyperlink:** It refers to reaching the linked document with respect to the current location. It will include the partial cell address in hyperlink. If the start and target locations change relative to each other, then relative hyperlink will not work.
- **Absolute Hyperlink:** It refers to reaching to the linked file by writing the complete address starting from the root directory. If the target location only changes then the absolute hyperlink will stop working.

4. What do you understand What -If Analysis?

Ans. What-If analysis involves exploring how changes in input variables affect the results of a formula or model. This analysis can be conducted with one input variable (one-input analysis) or two input variables (two-input analysis). The description of each input is as follows:

- **One-Input What-If Analysis:** One-input What-If analysis allows you to examine how changes in a single input variable impact the outcome of a formula or calculation. You typically set up a column or row of cells containing different values for the input variable, and then observe how these changes affect the result of a formula elsewhere in the spreadsheet. For example, if you're analysing the impact of interest rates on loan payments, you might vary the interest rate across a range of values to see how it affects the monthly payment.
- **Two-Input What-If Analysis:** Two-input What-If analysis extends this concept to explore the effects of changes in two input variables on the outcome of a formula or calculation. You set up a grid of cells containing different combinations of values for the two input variables, and observe how changes in both variables simultaneously affect the result of the formula. For example, if you're analysing the impact of both interest rates and loan terms on monthly payments, you might vary both variables across a grid to see how different combinations affect the payment amount.

5. What are the advantages of using macros?

Ans. This process of saving the sequence of commands or keystrokes by a specific name for the later use is called macros. The main advantages of using macros are:

- It helps you save time as the long and time consuming tasks are saved as macros and can be executed with a click of a button.
- It saves you from the tedious repetitive tasks.
- The chances of errors in the complex task are reduced.
- You can run a macro as many times as you want until you delete it from the computer.

6. What are the uses of Hyperlinks?

Ans. Hyperlinks helps you to:

- move to a specific cell within the current workbook.
- move to a specific location in another file. This file can be a spreadsheet, document, or any other file.
- access a specific website.
- send an email to a specific address.
- create a new file.

7. Why do we need to share a file? Write the steps to share a worksheet?

Ans. A file is sometimes required to be accessed by multiple users at the same time for editing. For this purpose the file can be placed in the network so that it can be shared by several users and can be accessed simultaneously.

The steps to make the spreadsheet shareable with the other users are as follows:

Step 1: Open the spreadsheet.

Step 2: Select on the **Tools** a **Share Document** option from the menu bar.

The **Share Document** dialog box opens.

Step 3: Select the **Share this spreadsheet with other users** check box to enable the sharing feature.

Step 4: Click on **OK** button.

The **Confirmation** message box opens.

Step 5: Click on **Yes** button to continue.

The **(shared)** word is displayed with the file name on the Title bar to indicate that the file is in the shareable mode.

If you wish to reverse the shared mode into unshared mode, then make a copy of the same file using **File** → **Save as**. This will create a copy of the spreadsheet without shareable mode.

C. Competency-based/Application-based questions:

21st Century Skills #Critical Thinking

1. The salesman has saved the quarterly sale of his products in three different sheets of the same workbook. He wants to make an annual sales report by using these three files. Help him do the following:
   a. Name the feature to make a consolidated sales report of the year.
   b. Give the way to access this feature LibreOffice Calc.
   c. Also name the feature that will help him find the area wise average sales in one quarter.

Ans. a. Data consolidation means to collect data from different sources into a common place by using different built in functions like sum(), max(), min(), average(), etc.

b. Select the Data → Consolidate option from the Menu bar.

c. The Subtotal feature that will help him find the area wise average sales in one quarter. Group-wise calculation of sum, average, max, min, count, etc. can be done by using the Subtotal option of LibreOffice Calc. The step to use it Select the Data → Subtotal option.

2. The librarian wants to check the quantity and price of the five books by saving the multiple values for the same cell so that calculation and what if data analysis can be easily done. Name the what-if analysis tools of LIbreOffice Calc. Also give the steps to do so.

Ans. Scenarios are what-if analysis tools of LIbreOffice Calc used for the above case. It helps you set multiple values for the same cell that can be used for calculations or data analysis. After the scenarios are created they can be edited and formatted independent of each other. You can easily switch between the scenarios using the drop down list or Navigator and can create several scenarios for any given range of cells.

The steps to use it:

Step 1: Click on the Tools menu.

Step 2: Select the Scenarios option.

Assertion and Reasoning Questions:

Direction: Questions 3-4, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions by selecting the appropriate option given below:

a. Both A and R are true and R is the correct explanation of A.

b. Both A and R are true but R is not the correct explanation of A.

c. A is true but R is false.

d. A is false but R is true.

3. **Assertion (A):** Cell references in a spreadsheet allow for automatic updates in the results of formulas when cell values change.

   Reasoning (R): Cell references consist of a column letter followed by a row number, and ranges of cells are indicated by separating the starting and ending cell addresses with a colon.

Ans. b

4. **Assertion (A):** What-If analysis involves exploring how changes in input variables affect the results of a formula or model.

   Reasoning (R): One-input What-If analysis allows you to examine how changes in a single input variable impact the outcome of a formula or calculation.

Ans. a

Statement Based Questions:

Two statements are given. Statement 1 and Statement 2. Examine the statements and answer the question according to the instructions given below.

a. Statement 1 is TRUE, Statement 2 is TRUE
b. Statement 1 is FALSE, Statement 2 is False
c. Statement 1 is TRUE, Statement 2 is False
d. Statement 1 is FALSE, Statement 2 is TRUE

5. **Statement 1:** Storing a spreadsheet in a network location allows multiple users to edit it simultaneously.

   Statement 2: Sharing a spreadsheet with others is not necessary for collaborative work.

Ans. c

Unsolved

SECTION A (Objective Type Questions)

A. Choose the correct option.

1. To _____ the comment, hover the mouse pointer over the cell that has the comment.
   a. Edit
   b. View
   c. Hide
   d. None

2. You can save time by saving the repeated commands as _____.
   a. Scenario
   b. Goal Seek
   c. Macros
   d. Subtotal

3. _____ tab in the Manage Changes dialog box is used to specify the filter criteria.
   a. Tools
   b. Data
   c. Filter
   d. Criteria

4. In spreadsheet, to apply Goal Seek your cell pointer must be in _____.
   a. The Changing cell whose value you need to find
   b. The Result Cell where formula is entered
   c. The cell where your targeted value is entered
   d. The active cell with no value

5. Which of the following tools deals with multiple unknown values?
   a. Goal Seek
   b. Scenario
   c. Solver
   d. Subtotal

6. Which of the following options is not present in the Hyperlink dialog box?
   a. Internet
   b. Mail & News
   c. Document
   d. Video

7. Which of the following menu contains the Consolidate option?
   a. View
   b. Tools
   c. Data
   d. Insert

8. A _____ is the method used to refer to a cell or a range of cells within a spreadsheet.
   a. Macro
   b. Cell reference
   c. Subtotal
   d. Solver

9. Which of the following is the correct method to make a cell reference using another workbook?
   a. ='file.ods' #sheet1.A3
   b. ='file.ods' @sheet1.A3
   c. ='file.ods' &sheet1.A3
   d. ='file.ods' +sheet1.A3
10. Which of the following options is used to delete a worksheet?
   a. Delete Sheet
   b. Remove Sheet
   c. Exit Sheet
   d. Rename Sheet

B. Fill in the blanks.

1. _____ is the default extension of LibreOffice Calc.
2. At the bottom of each worksheet window is a small tab that indicates the _____ of the worksheets in the workbook. [CBSE Handbook]
3. When you open a new worksheet, the default number of sheet(s) is/are _____.
4. Formulas in a spreadsheet must begin with a _____ sign.
5. _____ option creates a hyperlink to connect to a web address.
6. _____ refers to reaching to the linked file by writing the complete address starting from the root directory.
7. A _____ refers to a cell or a range of cells on a worksheet and can be used to find the values or data that you want formula to calculate. [CBSE Handbook]
8. Data found in the original file but not in the edited version is marked as _____.

C. State whether these statements are true or false:

1. The Hyperlink icon is present in the Drawing toolbar. _____
2. Comments in spreadsheets serve the purpose of providing additional information, context, or explanations about specific data or formulas within the spreadsheet. _____
3. Linking a section of the same worksheet cannot be done. _____
4. Comments once created can easily be edited. _____
5. Changes made in a shared document can easily be accepted and rejected. _____
6. Data which is changed is marked as changed. _____
7. Spreadsheet software allows the user to share the workbook and place it in the network location where several users can access. _____
8. We can rename a worksheet by using the Rename Sheet dialog box. _____

SECTION B (Subjective Type Questions)

A. Short answer type questions:

1. Give the steps to rename a sheet.
2. Differentiate between relative and absolute hyperlink.
3. What is the purpose of adding comments? [CBSE Handbook]
4. Write the steps to show or hide comments in LibreOffice Calc.
5. Write the steps to enable the Macro Recording feature.
6. Give the steps to compare two worksheets?
7. How can we record a macro? [CBSE Handbook]

B. Long answer type questions.

1. List down the issues that you may face at the time of saving a shared document.
2. What is the need of creating hyperlinks?
3. Give the steps for recording and running macro.
4. Give the steps to link to an external data source.
5. How do you access the code window of a macro?
6. How do you create a simple macro function?
7. Write the steps to format comments in LibreOffice Calc.
8. What do you mean by data analysis? Why is it important? Write the names of the tools used in data analysis.

C. Competency-based/Application-based questions:

#Communication
#Critical Thinking

1. Amit wants to combine and find the average of marks obtained by his five friends in the previous three periodic tests. The data is stored in various sheets of a workbook. Which tool is best suited for him? Write the steps also to simplify his work.
2. Rohit scored 25 out of 30 in English and 22 out of 30 in math. He wants to calculate the score in IT to achieve 80 percent in aggregate. Suggest to him the appropriate what-if analysis tool to get the desired result. Provide the steps for implementing it in a spreadsheet to achieve the aforementioned percentage.
3. Krish and Kritika have done a survey of age-wise literacy rates of their locality as a school project, which they have created in a Spreadsheet. They both want to work simultaneously to complete it on time. Which option they should use to access the same Spreadsheet to speed up their work. Also give the steps to make a shared document.
4. Rohan wants to buy a birthday gift for his friend only using his pocket money. He gets Rs. 500 per month. He plans to spend 200 and save 300 so that he can buy a book for his friend. When he went to the market he found that the book is for Rs. 275. Name the what-if analysis tool that he will use to find the money which now he can afford to spend.
5. Raj has created a worksheet where he has added all the information of his employees. He wants every employee to go through the worksheet and update their address and phone number, if required.
   a. Which feature of the spreadsheet should they use to see the changes made by his employees?
   b. Give the steps to use the above feature in spreadsheet.
   c. If he needs to add comments for the changes made then give the steps to do so.
   d. What are the steps if he wishes to make the changes permanent?
6. Sneha wants to use LibreOffice Calc for calculation and data analysis of her targets given to her by her boss in the company. She is actually new to the software and needs some help in using some of its features. Help her out by giving the steps for the following tasks:
   a. How can she add more sheets to the same worksheets?
   b. She wants to rename the existing worksheets.
   c. Delete the unwanted sheets.
   d. Adding a hyperlink to connect to the company's web address.

Assertion and Reasoning Questions:

Direction: Questions 7-8, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions by selecting the appropriate option given below:

   a. Both A and R are true and R is the correct explanation of A.
   b. Both A and R are true but R is not the correct explanation of A.
   c. A is true but R is false.
   d. A is false but R is true.

7. **Assertion (A):** If a function or formula is copied or moved, the cell address in the formula is automatically updated with respect to the new location.

   Reasoning (R): In LibreOffice Calc, you can use cell references to refer to data on sheets of other spreadsheets.

8. **Assertion (A):** Two-input What-If analysis allows you to examine the effects of changes in two input variables on the outcome of a formula or calculation.

   Reasoning (R): You set up a grid of cells containing different combinations of values for the two input variables and observe how changes in both variables simultaneously affect the result of the formula.

Statement Based Questions:

Two statements are given. Statement 1 and Statement 2. Examine the statements and answer the question according to the instructions given below.

a. Statement 1 is TRUE, Statement 2 is TRUE
b. Statement 1 is FALSE, Statement 2 is False
c. Statement 1 is TRUE, Statement 2 is False
d. Statement 1 is FALSE, Statement 2 is TRUE

9. **Statement 1:** Comments in spreadsheets are solely for decoration and have no practical purpose.

   Statement 2: Comments can be used to explain specific formulas or data points for better understanding.

LAB ACTIVITY

21st Century Skills #Technology Literacy #Creativity

1. Create the following worksheet in LibreOffice Calc and display the sum of items according to items and then city.

	A	B	C	D	E	F
1	**No**	**Item**	**City**	**Quantity**	**Price**	**Total**
2	101	Pen	Lucknow	2400	20	48000
3	102	Pencil	Meerut	3000	10	30000
4	103	Eraser	Noida	5000	20	100000
5	104	Notebook	Lucknow	2300	40	92000
6	105	Pencil	Ghaziabad	2586	10	25860
7	106	Pen	Noida	4000	20	80000
8	107	Sharpener	Agra	4000	10	40000
9	108	Notebook	Aligarh	5000	40	200000

2. Enter the following data into the worksheet and compute the strike rate of the batsman:

Runs Scored	67
Balls Faced	78
Strike Rate	85.90

Now find out the strike rate on the basis of the following records:

i. When score is 45 and balls faced are 30.
ii. When score is 40 and balls faced are 90.
iii. When score is 89 and balls faced are 100.

3. Create the following worksheet in Calc:

	English	Hindi	Maths
Test 1	17	16	17
Test 2	15	16	18
Test 3			

Use the goal seek feature to predict how much marks should the student score in Test 3 to get 88% marks in total.

UNIT 3

Database Management System

TOPICS COVERED

95%

- Data and Information
- Data Model
- Creating a Database Using LibreOffice Base
- Data Types in Database
- Edit Table in Design View
- Navigating Record In a Table
- Renaming a Table
- What are Relationships?
- What is Query
- What is a Form?
- Database
- Relational Database Management System (RDBMS)
- Opening a Database
- Creating a Table
- Inserting Data in a Table
- Deleting a Table
- Closing LibreOffice Base
- Referential Integrity
- Structured Query Language(SQL)
- What is Report?

A database is an organised collection of structured information or data, typically stored in tabular format. It is designed to efficiently manage, retrieve, and manipulate data according to various criteria or requirements. Databases are widely used in numerous applications, ranging from simple personal record-keeping to complex enterprise-level systems.

LibreOffice Base is a free and open-source relational database management system (RDBMS) included in the LibreOffice suite. It provides a graphical user interface (GUI) for users to create, modify, and manage databases. LibreOffice Base offers features for designing forms, creating reports, and querying data, making it a versatile tool for both individuals and organisation requiring database management capabilities without the need for expensive proprietary software.

DATA AND INFORMATION

Data consists of raw facts and figures. It can be in the form of text, numbers, dates, images, audios, videos, etc. Some of the examples of data are name, age and address of a student, amount and price of an item bought from the market. This collection of related data arranged in the form of rows and columns will form structured data.

The structured data can be classified as:

- **Flat file:** It stores data in a plain text format. The data is in the form of rows and columns, but data constraints cannot be applied, and there are chances of data redundancy. For example: data created using tabs or commas in Word, CSV file, Spreadsheet file, etc.
- **Relational file:** It stores data of different data types like text, number, and date in the form of rows and columns to form a table. These tables are linked through a common field, so there are no chances of data redundancy.

For example:

- Numbers: 1, 2, 3, 4, 5
- Words: Apple, Banana, Cherry, Date, Elderberry
- Temperature readings: 25°C, 28°C, 30°C, 27°C, 22°C
- Time stamps: 9:00 AM, 10:00 AM, 11:00 AM, 12:00 PM, 1:00 PM

For data to be useful, it needs to be processed by a computer or another computing device. **Information** is processed, organised, and meaningful data that provides context, relevance, and value. It is the result of interpreting, analysing, and synthesising data to derive insights or make decisions. If data is not correct or accurate, the information obtained by processing such data may not be correct. For example, in a library database, information could be the availability status of a book, its location in the library, and the borrower's details. Other forms of information are pay-slips, schedules, worksheet, bar charts, invoices, account returns etc.

For example:

- The average of the numbers is 3.
- Fruits: Apple, Banana, Cherry, Date, Elderberry
- The temperature increased from 25°C to 30°C between 9:00 AM and 11:00 AM.
- At 12:00 noon, the temperature was 27°C.

DATABASE

A **database** is a collection of logically related data items stored in an organised manner. The information being stored in a database can be added, modified, deleted or displayed according to the requirements of the user. We are using a database in almost every field. It is used by the school to store information about students and books in the library. When we go shopping then the shopping complex uses a database to maintain the details of stock and customers. Companies use databases to keep track of their employees' information. In almost every field, we are directly or indirectly using a database.

The software that is used to create, update and retrieve data in a database is known as **Database Management System (DBMS)**. It facilitates planning and maintenance of the database for the user. Some of the commonly used Database software are as follows:

- Oracle
- Microsoft Access
- MySQL
- Ingress
- SQL Server
- dBase
- MongoDB
- OpenOffice Base
- LibreOffice Base

LibreOffice Base is an open-source RDBMS. In this unit, we will learn Database concepts using LibreOffice Base.

Features of Database

The main features of a database are as follows:

- There can be more than one table in a database. For example, in a school, in the Students' database, there can be one table for saving personal details about the student. Another table may be to save the marks and progress of the student. Other tables may include fee details, library books issued, etc. all related to the student.
- The information stored in a table in a database relates to one specific topic. So, all the related information on a topic can be viewed in one single table.
- In a database, data can be simultaneously accessed by many users. So, it saves storage space by storing one table at one place from where every authorised user can access it.
- Database offers data protection and features like recovery and backup for easy recording and retrieval of data.
- Database allows the users to view data in different views with the required information only.
- Data stored in a database remains permanently stored till the time it is manually deleted from the system/ server.
- If the database table has a unique field, then there are minimum chances of duplication of data which avoids confusion at a later stage.

Advantages of Database

Some advantages of the database are as follows:

- **Organised storage:** Databases employ structured formats and indexing mechanisms to organise data efficiently, which allows fast and accurate retrieval of information. This organisation typically follows a predefined schema, ensuring data integrity and facilitating query operations.
- **Data analysis:** DBMS systems provide powerful querying capabilities that enable users to perform various analyses on the stored data. Aggregate functions, sorting, filtering, and grouping operations make it easy to understand such as maximum, minimum, average, or other statistical measures from the data.
- **Reduces data redundancy:** Data Redundancy means keeping multiple copies of the same data in a System. Using DBMS, the data in tables are interlinked through a common column to avoid duplicate entries. Data constraints are applied to store data based on different criteria.
- **Sharing of data:** It means data can be accessed by multiple users at the same time. Different users can have different rights and privileges to access data. Some may have the right to only view the data. Some may have permission to modify the data. Database administrators manage the rights and privileges for sharing data through a centralised system.
- **Data consistency:** It ensures that data remains accurate, reliable, and uniform across the database. By minimising data redundancy, chances of inconsistent data being stored is reduced. For example, it should not happen that the name of the student is changed in one table and not in another. Such inconsistency is reduced by using a DBMS.
- **Increases efficiency:** By organising data in a structured manner and optimising storage and retrieval mechanisms, databases enhance overall system efficiency. Indexing, caching, and query optimisation techniques ensure that operations like data insertion, retrieval, and modification are performed quickly and with minimal resource utilisation.
- **Increases accuracy:** The centralised nature of databases and the enforcement of data integrity constraints ensure that the information stored is accurate and reliable. Redundancy reduction and normalisation techniques mitigate the risk of errors caused by duplicate or inconsistent data.
- **Increases Validity:** Database systems allow the specification of data validation rules and constraints at the schema level. These rules enforce the integrity and validity of data at the point of entry, preventing the insertion of invalid or inappropriate data values. This ensures that the database maintains a high level of data quality and reliability.
- **Data security:** DBMS provides data security so that only authorised users can have access to the database. For security reasons, different users have different privileges. Also, users have assigned user IDs and passwords for authorised access to the centralised database.
- **Data backup and recovery:** DBMS provides data backup and recovery features. Users can maintain data backup on weekly or fortnightly so that if data loss occurs due to system failure the data recovery process can be easily carried out.

DATA MODEL

A data model in database management systems (DBMS) is a conceptual representation of how data is organised and structured within the database. It defines the relationships between different types of data, the constraints that apply to the data, and the operations that can be performed on the data.

Hierarchical Data Model

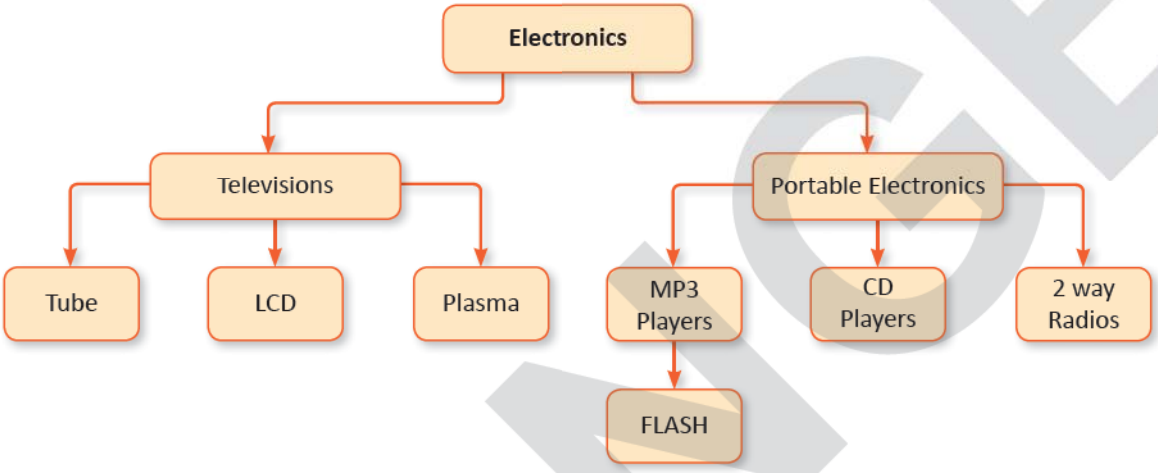
The Hierarchical Data Model organises data like a family tree. At the top is a single parent, and underneath are children, who can have children of their own. The data is stored in the form of records. A record is a collection of fields and their data values. All these records are linked to each other at various levels, thereby forming a hierarchy. Think of it like files and folders on a computer, where each folder can contain multiple files or subfolders.

While simple to understand and navigate, this model can be rigid and challenging to adapt when data relationships change.

The hierarchical data model encompasses the following elements:

- It comprises nodes linked by branches.
- The highest node is known as the root node.
- When multiple nodes exist at the highest level, they are termed root segments.
- Every node possesses precisely one parent.
- A single parent can have numerous children.

The following figure shows the hierarchical data model:

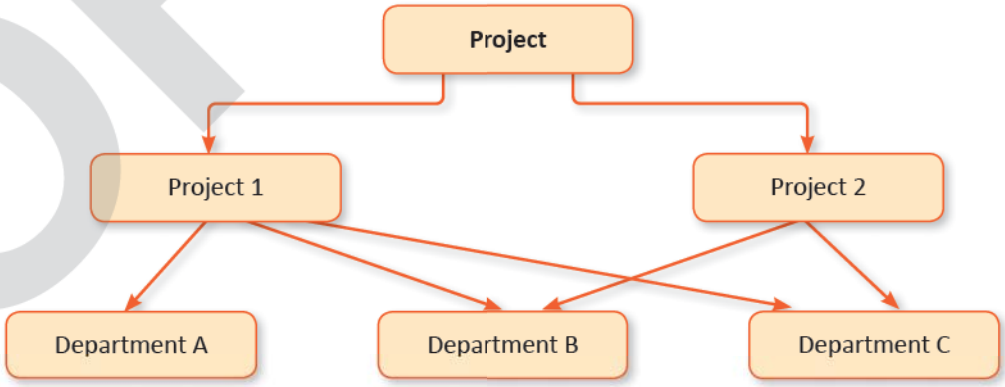


In the figure, "Electronics" is the main category, like the trunk of a tree. It has two main branches: "Televisions" and "Portable Electronics." Each of these branches then further divides into more specific types, like "Tube," "LCD," and "Plasma" under "Televisions." This setup shows how one category can have several subcategories, like a family tree.

Network Data Model

The Network Data Model has multiple records linked to the same master file. It is also considered as an inverted tree where master is present in the bottom of the tree and the branches contain information linked to the master. This model offers more flexibility in organising data, but it can be harder to manage compared to simpler models.

The following figure shows the network data model:



In the figure, "Project" stands as the starting point, with two branches: "Project 1" and "Project 2." "Project 1" has three further branches, while "Project 2" has two. Together, they comprise five branches: "Department A," "Department B," and "Department C," all network related. As mentioned earlier, this model allows multiple parents, so "Department B" and "Department C" have two parents each: "Project 1" and "Project 2."

Relational Data Model

This data model is based on the principle of setting relationships between two or more tables of the same database. It is the most used database model. The relational database model was proposed by Edgar F. Codd in 1970. Relational database model is the most common type of database model. In the relational database model, data is organised into tables, with each table consisting of rows and columns. Each row represents a record or entity, and each column represents a specific attribute or field of that entity. The data in different tables are related with common fields. So, relations are set between tables based on common fields. That is why this model is termed as relational database model. These relationships enable the database to maintain data integrity and enforce constraints such as referential integrity.

By storing related data in separate tables and establishing relationships between them, the relational model allows for efficient data organisation, retrieval, and manipulation. This model's flexibility and scalability make it one of the most widely used and versatile database models in various industries and applications.

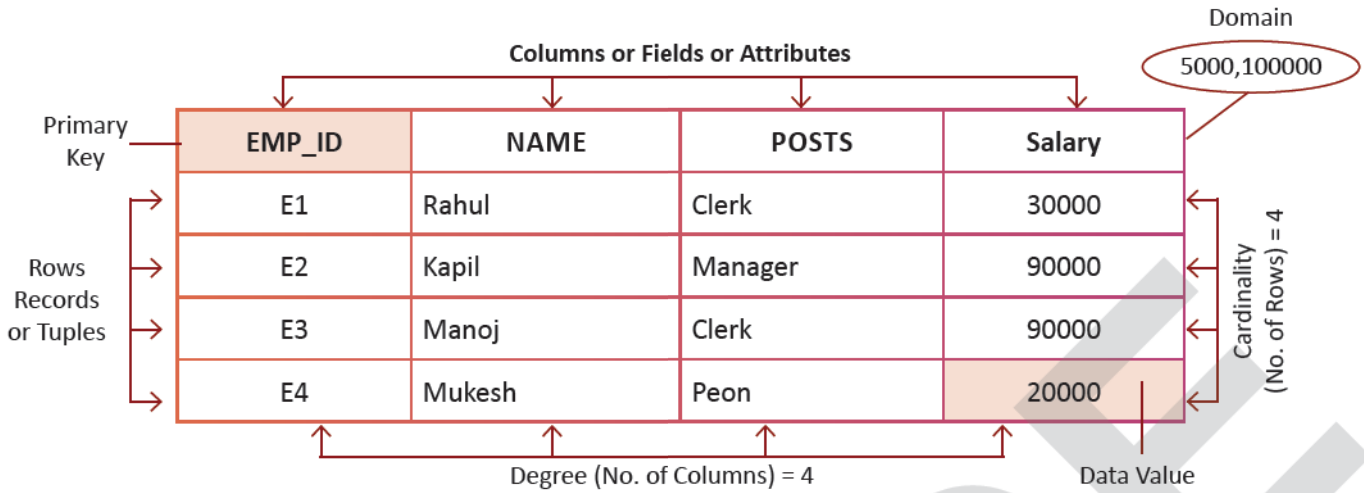
The difference among hierarchical, network, and relational data models is shown in the following table:

S. No.	Hierarchical Data Model	Network Data Model	Relational Data Model
1	Data is organised in a tree-like structure, with parent-child relationships.	Like the hierarchical model but with more flexible relationships.	Data is represented in tables consisting of rows and columns.
2	Each child node has exactly one parent node.	Nodes can have multiple parent nodes, allowing for more complex connections.	It's based on mathematical set theory and predicate logic.
3	It's primarily used in older database systems.	It uses pointers to represent relationships between records.	Relationships between tables are established using keys, primarily primary and foreign keys.
4	It is rigid in structure and is not suitable for applications with evolving data structures or complex relationships.	Developed as an improvement over the hierarchical model but still has limitations in terms of complexity and scalability.	Offers flexibility and scalability, making it widely adopted in modern database systems.
5	Querying hierarchical data can be complex due to its rigid structure.	Querying in the network data model can be more complex compared to the relational model.	Querying is simplified with SQL (Structured Query Language) which provides a standardised way to retrieve and manipulate data.

RELATIONAL DATABASE MANAGEMENT SYSTEM (RDBMS)

RDBMS is an advanced form of Database Management System and is based on a Relational Model. In this model, a relational database has a set of related tables that are interlinked to each other based on a common field. It is a very efficient way of representing data and allows data in a table to be represented in a two-dimensional form and is known as a **Relation**. A row that forms complete information is known as a **Tuple or Record or Row**. Each tuple uniquely identifies a record based on a unique key-known as **Primary key**. Data from different relations can be easily extracted as they are interlinked based on a Primary key. A column that stores similar data is known as an **Attribute** or **Field** or **Column**.

Structured Query Language (SQL) is the standard language for managing relational databases and performing various operations on the data in the tables. It would enable us to store, retrieve, and manipulate data in the tables.



Basic Terminologies of RDBMS

Some of the important terms of RDBMS are as follows:

- **Entity:** It is a real-world object about which information is to be stored in a database. For example, if we want to store information about an entity Student in a school, then we need to have his admission number, roll number, name, father's name, date of birth, etc. These details associated with the entity are called attributes. Each entity is a collection of these attributes associated with it. So, roll number, name, admission number, etc., are attributes associated with the entity student. These attributes are represented in the form of columns.
- **Tables:** Tables are the basic structure of a database where data is stored. A table is a collection of logically related records. It is organised as a set of columns and can have any number of rows. Each row represents a record, while each column represents a field or attribute of that record.
- **Data Values:** Data values are the raw data represented in numeric, character or alphanumeric form.
- **Fields/Columns:** Fields or columns are the individual pieces of data stored within a table. Each field has a data type associated with it, such as text, number, date, etc. A field is the smallest entity in the database. A collection of fields makes a record, a collection of records makes a table, and a collection of tables make a database.
- **Records/Rows:** Records or rows are individual entries within a table. The data values for all the fields related to a person or object is called a record. Each row represents a single instance of data, with each column containing a specific attribute or value for that instance.
- **Keys:** A key is a field or combination of fields that uniquely identify a record (row) in a table. Keys are essential for data integrity and for establishing relationships between tables in a relational database management system (RDBMS).
- **Relationships:** Relationships define how tables within a database are related to each other. Common types of relationships include one-to-one, one-to-many, and many-to-many. These relationships are established using foreign keys, which are fields in one table that reference the primary key of another table.
- **Constraints:** Constraints are rules that enforce data integrity within a database. They define the conditions that must be met for data to be inserted, updated, or deleted in a table. Common types of constraints include primary key constraints, foreign key constraints, unique constraints, and check constraints.
- **Queries:** Queries are commands or statements used to retrieve, manipulate, or analyse data within a database. They allow users to perform tasks such as selecting specific records, calculating aggregate values, updating data, and joining multiple tables together.
- **Degree:** This refers to the number of attributes or columns in a table. For example, if a table has five columns (attributes), then the degree of the table is 5.

- **Cardinality:** This refers to the number of tuples or rows in a table. For example, if a table has 100 rows, then the cardinality of the table is 100.

Different Types of Keys in a Relation

When the data is stored in the form of records, there are chances that the data values are repeated. For example, in a class of forty students if a table is created with - Name, Address, City, Date of Birth, and Phone number then there may be two or more students with the same name. There are also chances when twins staying in the same house will have the same address, Date of Birth and phone numbers. Two or more classmates may have different addresses or phone numbers but share the same birth date. So, with so many similarities and so many repetitions of values in different columns, we may face the following issues:

- If specific information is needed in a database, then searching will become difficult. For example, if we see the above table where there are two students with the same name- Smith. If a teacher wants to call the parents of Smith who lives in Defence Colony because he has been absent for a long time without any information, then it becomes difficult to search unless both records are uniquely identified.
- Searching might not give you the correct information.
- There are chances of storing duplicate and unwanted/ erroneous values in the table.
- If data is needed from two or more tables, then linking of multiple tables cannot be done unless there is a common and unique column.

A key or an attribute solves all the above problems. It stores data values of a similar type. Different kinds of keys can be created in a table for the efficient retrieval of the data. These keys are as follows:

- **Primary key:** A primary key uniquely identifies each record (row) in a table. It must contain unique values and cannot contain NULL values (empty / nothing) i.e. At any time, no two rows in the table can neither have same values for the primary key nor can data value for such field be left blank. In the given table DEPT, the primary key is the DCODE column as it uniquely identifies each record. We can have only one primary key in a table.

DCODE	DEPARTMENT	CITY
D01	Media	DELHI
D02	Marketing	DELHI
D03	INFRASTRUCTURE	MUMBAI
D05	Finance	KOLKATA

Primary Key Cadidate Key Alternate Key

- **Candidate key:** An attribute or a set of attributes that can uniquely identify a record and is capable of being a primary key is called a candidate key. In the table DEPT, DCODE and DEPARTMENT are the candidate keys as they have chances of unique values. We can have atleast one candidate key in a table.
- **Alternate key:** A remaining candidate key which is not selected as the primary key is called an alternate key. In the table DEPT, the primary key is DCODE, and the alternate key is DEPARTMENT.
- **Composite key:** Sometimes a single attribute cannot be used as a primary key then in that case two or more attributes in combination will form a unique set of values which can be used as a primary key. Such a set of combinations of attributes is known as a Composite key. In the table DEPT, DEPARTMENT, CITY together are the composite keys as they have chances of unique values.
- **Foreign key:** It is an attribute or a set of attributes whose values match the primary key of another table. A primary key of one table when used in another table is called foreign key. A relationship between two tables matches the primary key of one table with the foreign key of another table.

Table: PRODUCT

PID	PRODUCTNAME	MANUFACTURER	PRICE	EXPIRYDATE
TP01	Talcum Powder	LAK	40	2011-06-26
FW05	Face Wash	ABC	45	2010-12-01
BS01	Bath Soap	ABC	55	2010-09-10
SH06	Shampoo	XYZ	120	2012-04-09
FW12	Face Wash	XYZ	95	2010-08-15

Table: CLIENT

CID	CLIENTNAME	CITY	PID
1	Cosmetic Shop	Delhi	FW05
6	Total Health	Mumbai	BS01
12	Live Life	Delhi	SH06
15	Pretty One	Delhi	FW05
16	Dreams	Bengaluru	TP01
14	Expressions	Delhi	NULL

Primary Key: PRODUCT- PID
CLIENT - CID
PID is a foreign key in the CLIENT table

In the above table PRODUCT, the primary key is PID. In table CLIENT, the primary key is CID. The relationship between PRODUCT and CLIENT is made because of the presence of a common field PID. So PID is a Primary key in table PRODUCT and a Foreign key in table CLIENT.

Find on Google

What is an attribute or a set of attributes whose values match the primary key of another table?

CREATING A DATABASE USING LIBREOFFICE BASE

Following the given steps to create a database using LibreOffice Base:

Step 1: Click on the **Start** button. The Start menu will appear.

Step 2: Select the **LibreOffice** folder from the **Start** menu.

Step 3: Click on the **LibreOffice Base** option.

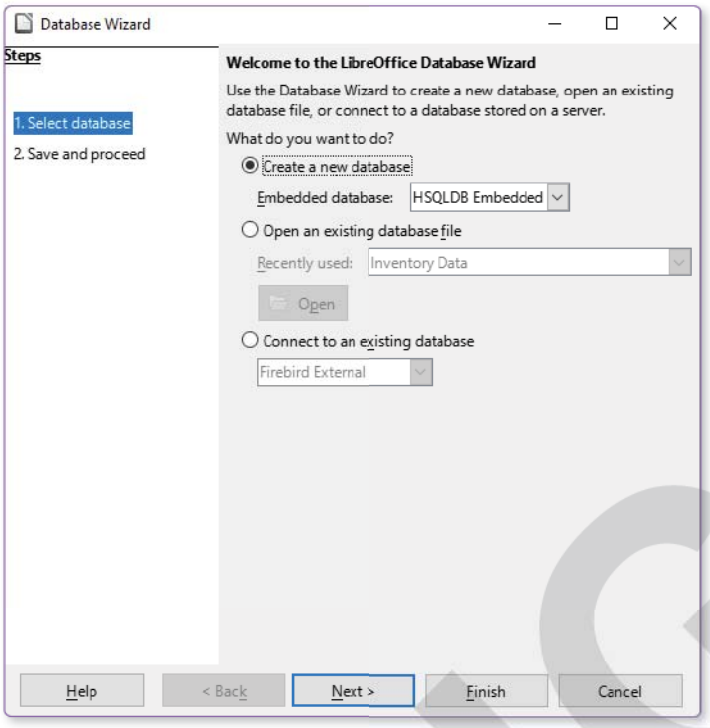
The **Database Wizard** with two steps will appear as explained below:

1. **Select database:** This will help you create a new database, open an existing database file or connect to a database stored on a server. So, you can select:

- **Create a new database:** To create a new database.
- **Open an existing Database File:** It helps you open an existing file displayed when clicking on the drop-down list.
- **Connect to an existing database:** This can be used if the database is stored on a server.

Step 4: Select the **Create a new database** radio button.

Step 5: Click on the **Next** button.



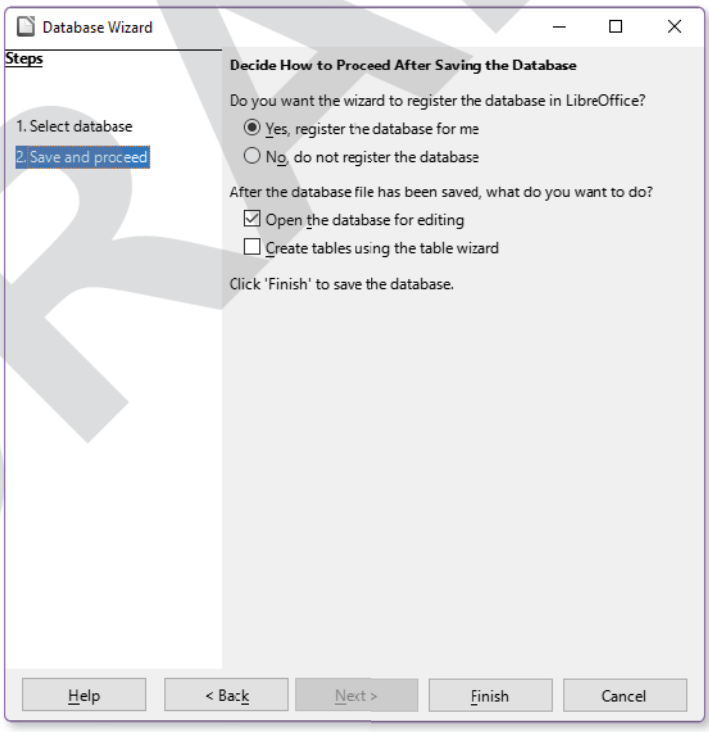
Database pane

2. **Save and proceed:** This step will help you create a new database, save it and then open it for editing.

Step 6: Click on the **Yes, register the database for me** radio button.

Step 7: Click on the **Open the database for editing** check box.

Step 8: Click on the **Finish** button.

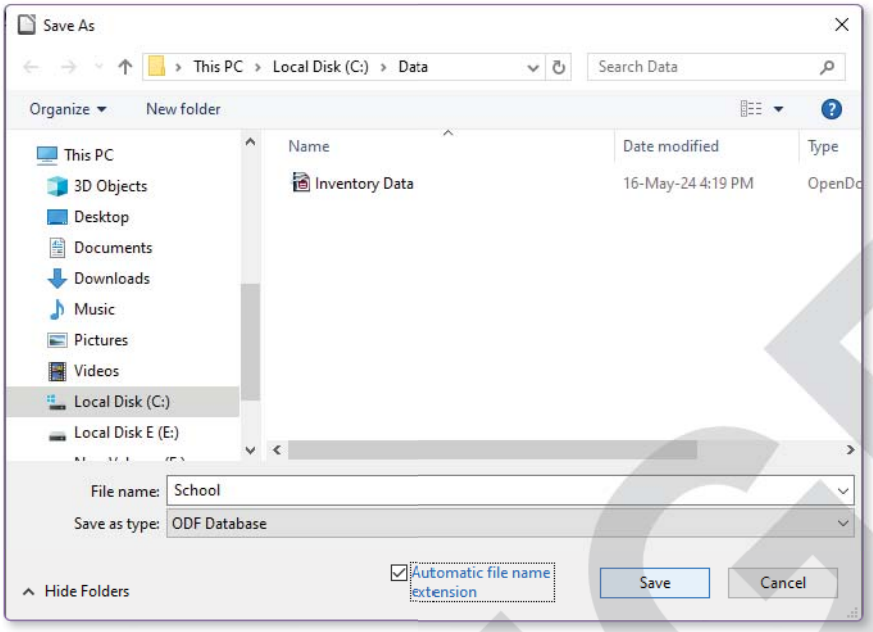


The **Save As** dialog box opens.

Step 9: Navigate the location where you want to save the database.

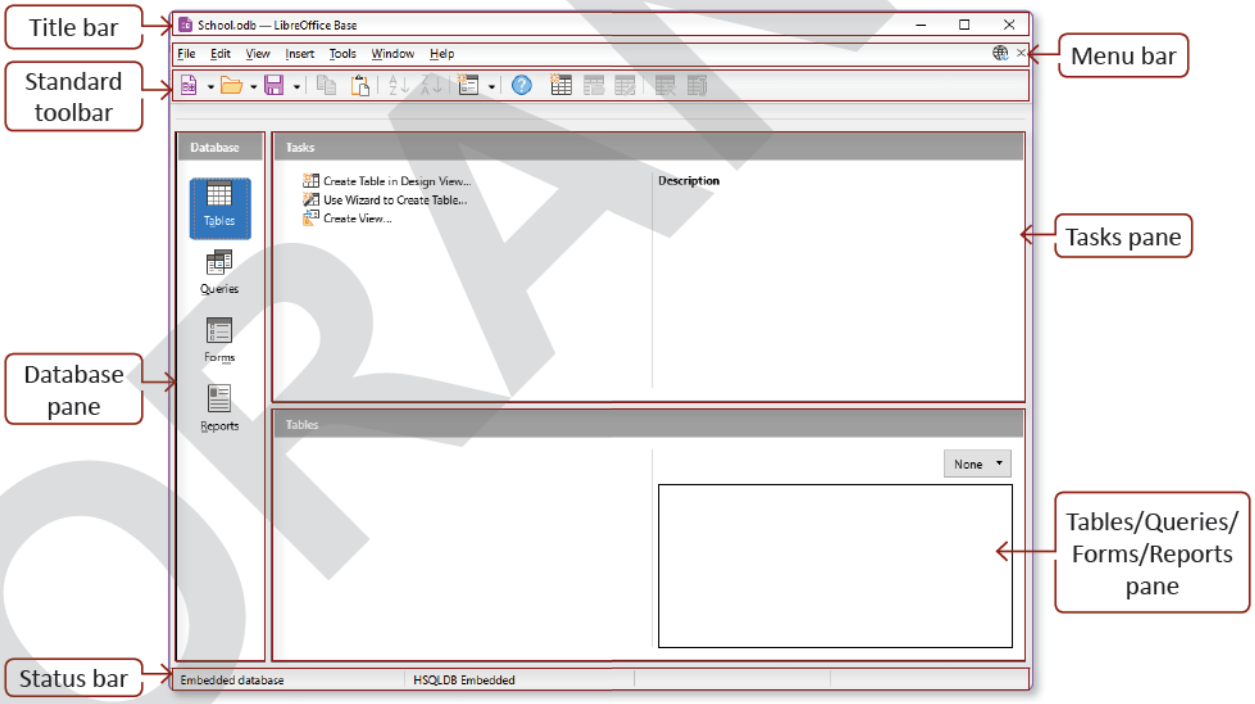
Step 10: Enter the desired name of the database in the File Name text box. In this case, we have entered **School**.

Step 11: Click on the **Save** button.



Note that an LibreOffice database is saved with an extension of .odb.

A new database with the name - School.odb is created with the objects **-Tables, Queries, Forms and Reports** and LibreOffice Base interface opens as shown in the picture below:



User Interface of LibreOffice Base

The user interface of LibreOffice Base is structured to provide users with easy access to database management tools and functionalities. Here's an overview of its main components:

- **Title bar:** Title bar displays the name of the database being accessed and the name of the LibreOffice Base application. It also typically contains the window control buttons for minimising, maximising, and closing the window.

- **Menu bar:** Menu bar contains various menus such as File, Edit, View, Insert, Tools, Window, and Help. These menus offer a wide range of commands and options for managing databases, designing forms, creating queries, generating reports, and more.
- **Standard toolbars:** Standard toolbar is located below the Menu bar. It contains a set of commonly used tools and commands, offering quick access to essential functions. The icon on the Standard Toolbar allows users to perform tasks such as opening and saving databases, creating new objects (tables, queries, forms, reports), printing, sorting, etc.
- **Database pane:** Database pane provides a hierarchical view of the various elements within the database project. These elements typically include Tables, Queries, Forms, and Reports. Users can navigate through these components to manage and interact with their database objects.
- **Task pane:** The Tasks area provides several options to select common actions based on the selected object in the Database pane.
- **Tables/Queries/Forms/Reports pane:** The Tables/Queries/Forms/Reports pane, allows used to manage and access various elements of your database. By default, this pane is usually positioned below the "Tasks" pane, providing easy access to different objects within your database.
- **Status bar:** Status bar is located at the bottom of the interface window. This bar displays information about the current state of the database or the active object. It may indicate the number of records in a table, the type of view being used, or other relevant details.

Objects of a Database

In a relational database management system, an object in a database is a structure or a feature that is used to store, represent or retrieve data. In fact, a database is a collection of these objects that work on multiple sets of data related to each other. These objects serve various purposes and play critical roles in organising, accessing, and managing the database efficiently. These objects are displayed in **Database Pane** when you open **Database User Interface** window. These include:

- **Tables:** By default, Table Object is selected in the Database Pane. A table is the basic unit of any DBMS. It is a structured collection of data organised into rows and columns, forming a grid-like structure. Each row represents a single record or entry in the database, while each column represents a specific attribute or field pertaining to that record. Tables provide a logical and efficient way to organise data, enabling users to store, retrieve, and manipulate information with ease. They serve as the primary building blocks upon which the entire database is formed.
- **Queries:** Queries are powerful tools within an RDBMS that allow users to extract, manipulate, and analyse data stored in the database. Queries allow users to obtain the precise information they need for various purposes, such as reporting, analysis, or application development.
- **Forms:** A form is a feature of a database using which we can enter data in a table in an easy and user-friendly manner. They provide a user-friendly way to facilitate the input, editing, and viewing of data within an RDBMS with the help of graphical elements such as text boxes, drop-down menus, checkboxes, and buttons.
- **Reports:** Reports are formatted presentations of data generated from a database. They take raw data and turn it into a structured, easy-to-understand format. The output of a query may be displayed in the form of reports with data arranged in the form of rows and columns. But if we want the report to be formal and in proper layout, then we can use the Reports feature of RDBMS.

Quiz Bee

Table: STATIONARY

SID	SNAME	COMPANY	PRICE	STOCKDATE
DP01	Pen	ABC	10	2011-03-31
PL02	Pencil	XYZ	6	2010-01-01
ER03	Eraser	XYZ	7	2010-02-14
PL01	Pencil	CAM	5	2009-01-09
GP02	GelPen	ABC	15	2009-03-19

Table: CONSUMER

CID	CNAME	ADDRESS	SID
01	Good Learner	Delhi	PL01
06	Write Well	Mumbai	GP02
12	Topper	Delhi	DP01
15	Write & Draw	Delhi	PL02
16	Motivation	Bengaluru	PL01

Answer the following questions based on the above tables:

a. Identify the Primary Key for the tables STATIONARY and CONSUMER

b. Identify the Alternate Key of the table CONSUMER

c. Identify the Candidate Keys of the table STATIONARY

d. Identify the Foreign Key of the table CONSUMER

OPENING A DATABASE

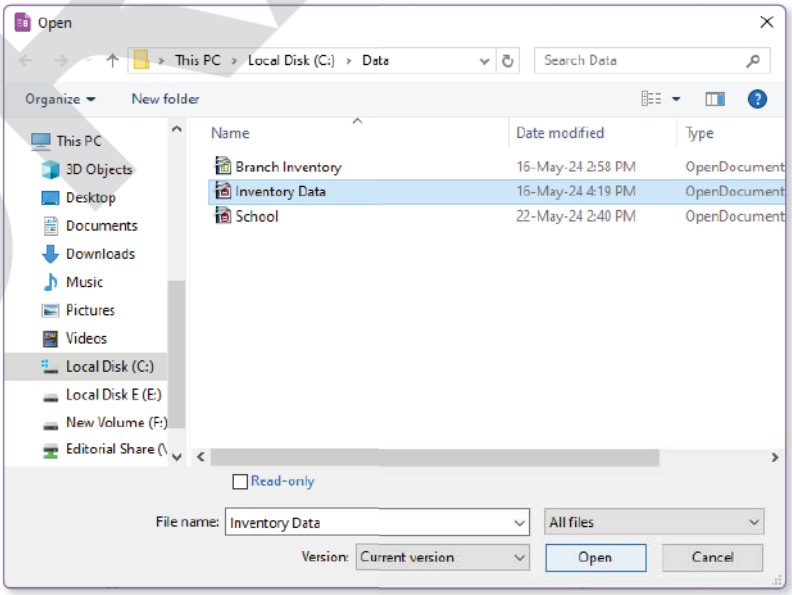
Follow the given steps to open an already created database:

Step 1: Select the **File → Open** option from the menu bar.
The **Open** dialog box open.

Step 2: Navigate the location where the database is stored.

Step 3: Select the desired database that you want to open.

Step 4: Click on the **Open** button.



The selected database gets opened.

DATA TYPES IN DATABASE

Data types help you define the type of the data that can be stored in a field/ column. Data types in LibreOffice Base are broadly classified into five main categories, which are as follows:

SHORT KEY

To open an already existing database:

Ctrl + O

Numeric Types

The numeric data types are used to store data in the form of numbers which can be integers or real numbers with decimals. Arithmetic operations can be performed on numeric data.

We can use these data types for creating fields like RollNo., Phone number, Marks, Year of Joining, Salary, Cost, Amount or any other numeric value.

The list of available numeric types is:

Data Type	Name	Signed	Description
Tiny Integer	TINYINT	No	Store integer range between 0 to 255
Small Integer	SMALLINT	Yes	Store integer range between -2^{15} to $+2^{15}-1$
Integer	INTEGER	Yes	Store integer range between -2^{31} to $+2^{31}-1$
Big Integer	BIGINT	Yes	Range between -2^{63} to $+2^{63}-1$
Number	NUMERIC	Yes	Unlimited
Decimal	DECIMAL	Yes	Unlimited
Real	REAL	Yes	$5\times e^{-324}$ to 1.79×10^{308}
Float	FLOAT	Yes	$5\times e^{-324}$ to 1.79×10^{308}
Double	DOUBLE	Yes	$5\times e^{-324}$ to 1.79×10^{308}

Alphanumeric/Text Data Type

It stores a set of numbers, alphabets or other characters. No arithmetic calculations can be performed on text data. We can use this data type for creating name, address, city, customer name, product name, product description, etc.

The list of available Alphanumeric/Text Data type is:

Data Type	Name	Description
Memo	LONGVARCHAR	Store up to the max length or number indicated by user. It is used to store some descriptive data having more than 255 characters. Memo data type allows to store text data up to 64000 characters. For example: Medical description of a patient, Student achievement details in student table.
Text (fix)	CHAR	Store exactly the length specified by user. It is used to store fixed number of characters. For example, Mobile number, Pincode, License Number, Passport Number etc. It uses fixed number of bytes specified.
Text	VARCHAR	Store up to the specified length but uses only variable length of characters entered. The number of bytes allocated depends on the number of characters. For example if Name in student table is VARCHAR(20) and you save name as "Vedika" which has 7 characters then only 7 bytes out of 20 will be used.
Text	VARCHAR_IGNORECASE	Store up the specified length. Comparisons are not case sensitive but stores capitals as you type them.

Currency Data Type

The currency data type indicates the monetary values and can be stored using currencies of various countries. For example: $100, £ 500 or ₹25.50

Binary Types

It stores the data in a binary format. It is used to store data for images, audio, video or files of any other format like voice messages, sound snippets, employee photo etc.

The list of the available binary types is:

Data Type	Name	Description
Image	LONGVARBINARY	Store any array of bytes (images, sounds, etc.). No validation required.
Binary (fix)	BINARY	Store any array of fix bytes. No validation required.
Binary	VARBINARY	Store any array of variable bytes. No validation required.

Date Time

It stores data in the form of date or time or both. The date and time can be stored in various formats. It can be used to store date of joining, date of birth, time of login, time of logout, retirement date, date of admission, etc.

The list of the available Date time types is:

Data Type	Name	Description
Date	DATE	Store month, day, and year information
Time	TIME	Store hour, minute, and second information
Date/Time	TIMESTAMP	Store date and time information

Boolean Data type

The Boolean data type is used to represent logical values, typically either True or False. However, LibreOffice Base doesn't have a native Boolean data type in the same way as some other database systems. Instead, it typically represents Boolean values using integer values, where 0 usually represents false and any non-zero value represents true.

CREATING A TABLE

To create a table, select the **Table** option in the Database pane. In the LibreOffice Base, there are two methods that are used to create a table. These methods are as follows:

- Create Table in Design View
- Use Wizard to Create Table

Now let us study each in detail.

Creating a Table in Design View

Design View allows you to manually specify the structure of your table by defining its fields, data types, and properties. You have complete control over the table's layout and can directly define attributes such as field names, data types (e.g., text, number, date/time), field sizes, and validation rules like creating tables using Design View gives us more flexibility.

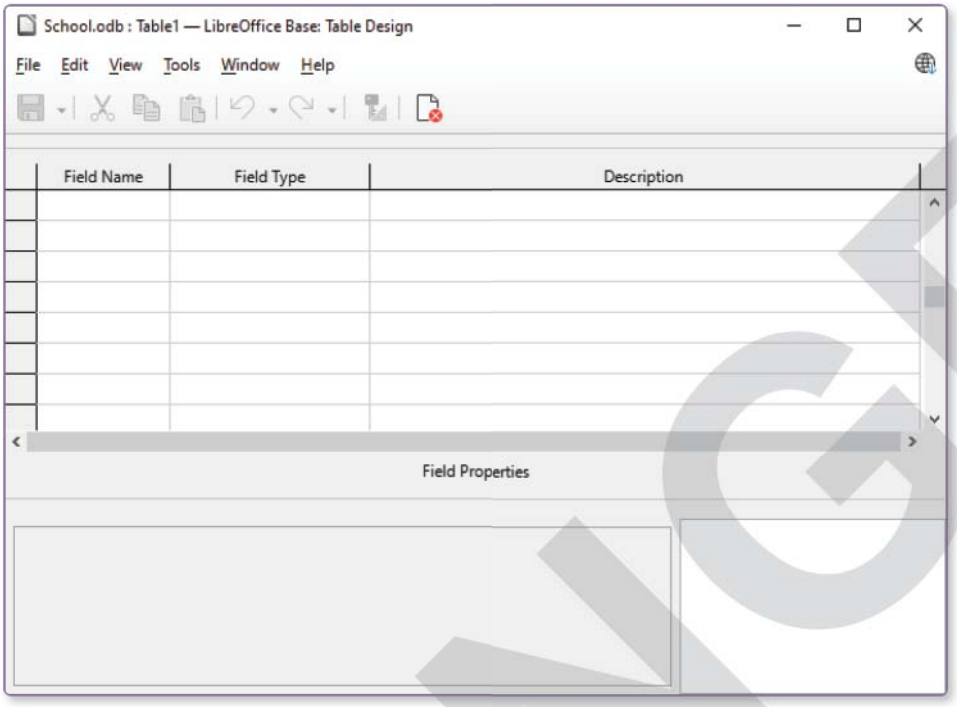
Let us create a table using this Design View. The steps are as follows:

Step 1: Open the **School.odb** database.

Step 2: Select **Tables** (default) option in the **Database** pane.

Step 3: Click on the **Create Table in a Design View** option from the **Tasks** pane.

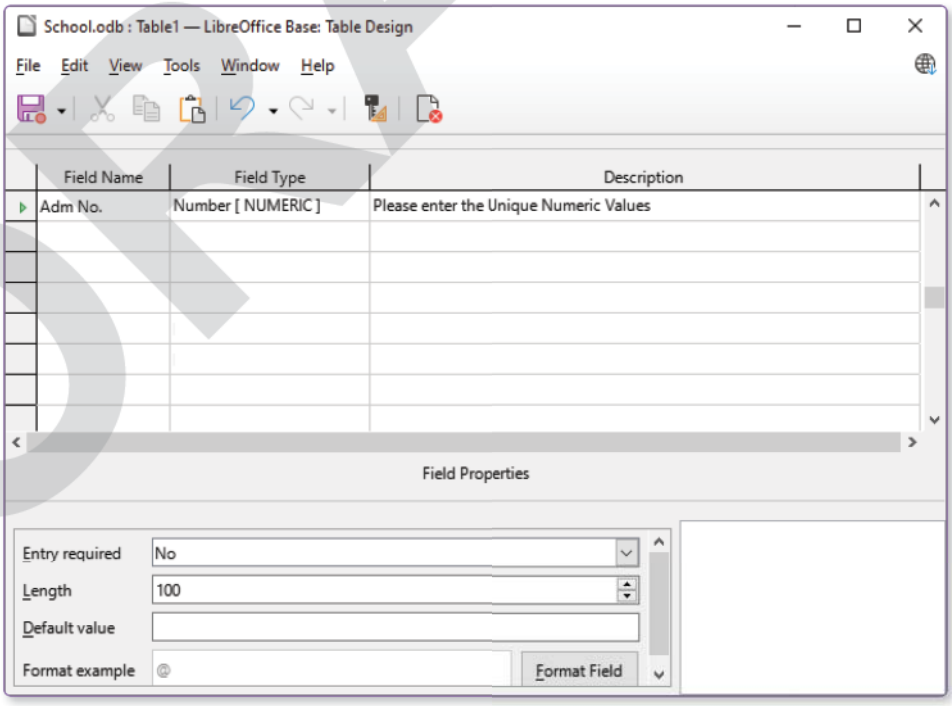
The **Design View** window opens:



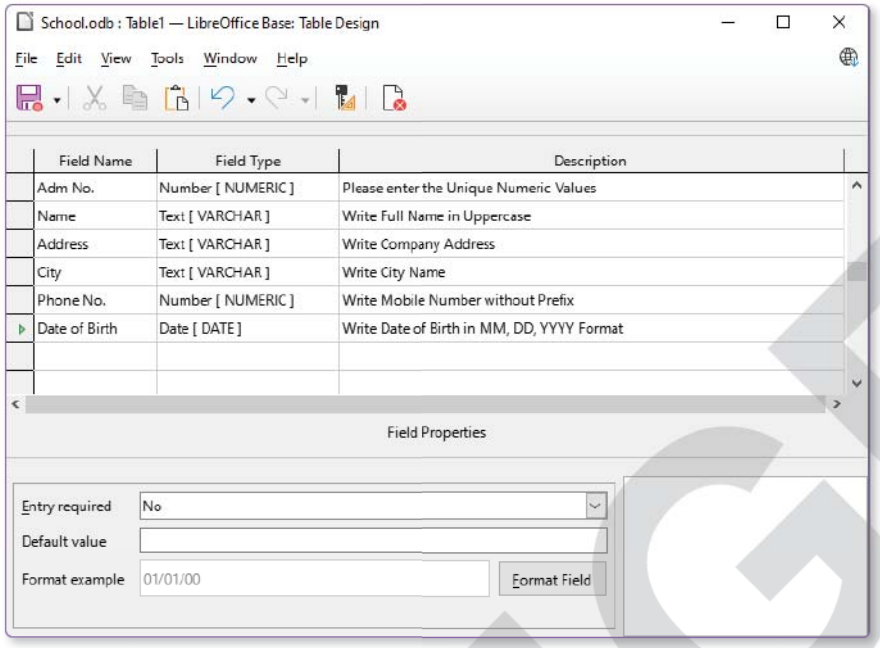
Step 4: Type the field in the **Field Name** column.

Step 5: Select the data type in the **Field Type** column.

Step 6: Type the description of the field in the **Description** column. It allows to describe the purpose of the field. It is not the part of database table, but it is meant for the user to understand the purpose of the field. We may or may not enter field description.



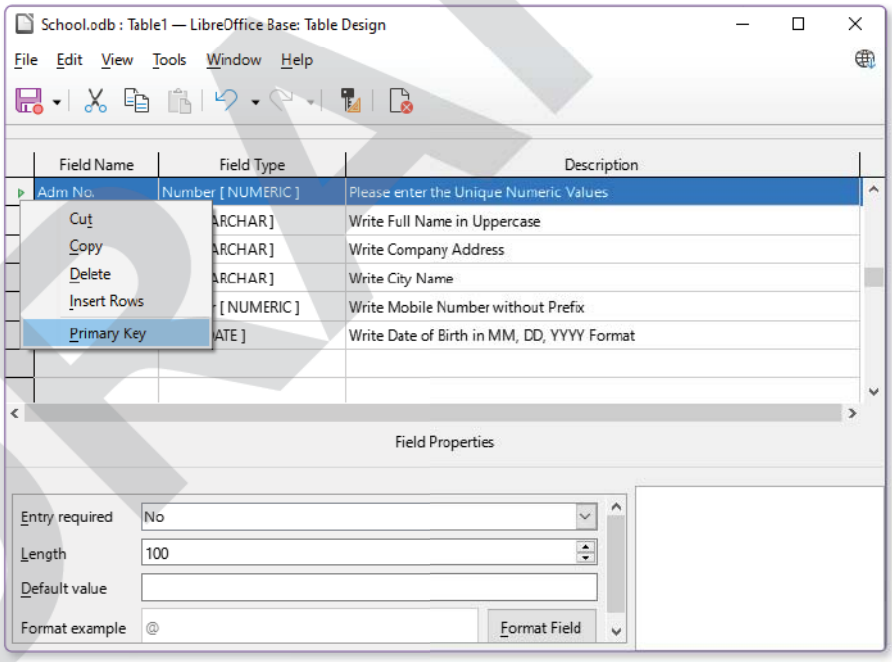
Step 7: Repeat Step 5 to 7 to add more fields in the table.



The green arrow key before the cell shows the currently active field. Move this arrow key to the first column created - **Adm No.** field.

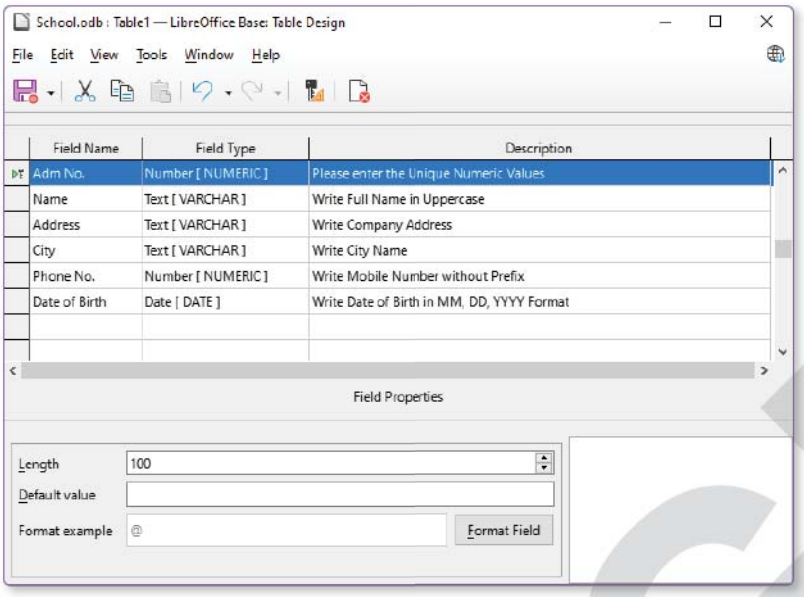
Step 8: Right-click on the arrow to display the context menu.

Step 9: Select **Primary Key** from the context menu as shown below:



A key-like symbol appears in front of **Adm No.** indicating that the column will now act like a primary key where only unique values are allowed, and no value can be left blank.

Note: To set a composite key, i.e. a primary key consisting of two fields, keep the Ctrl key pressed and then click on multiple fields to select them. Thereafter right click on selected fields and choose Primary Key option from the pop-up menu.



The Field Properties pane is located at the bottom half of the window. It displays the field properties assigned by the database designer. These properties can also be changed as per the requirement and are used to control and validate the data that is to be entered.

Step 10: Click on the **Save** button ( ) at the toolbar of the Design view.

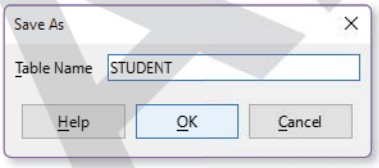
OR

Click on **File** menu and select **Save As** option to save the above created table.

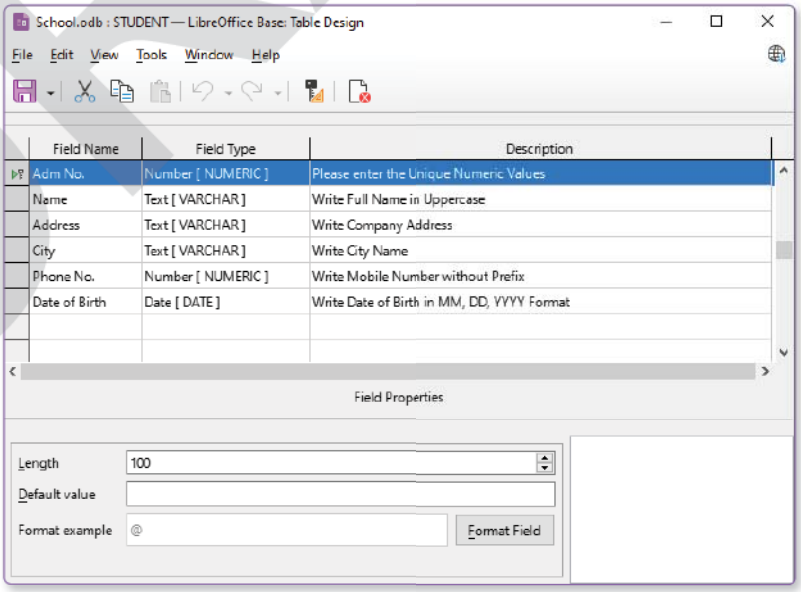
The **Save As** dialog box appears where the default name is **Table1**.

Step 11: Remove the default name and type the new name- STUDENT in the **Table Name** text box.

Step 12: Click on the **OK** button to save the table.



The table STUDENT appears as a table in the Database window as shown below:



Step 13: Double-click on the table STUDENT to open **Table Data View** where you enter the records.

Use Wizard to Create Table

A wizard is a step-by-step process of doing a specific task through a set of dialog boxes. Creating tables using wizards offers a convenient and efficient approach to database design, particularly for users who are less experienced or who need to quickly prototype database structures. On the other hand, for some users creating the table using wizard restricts to use the same fields in the per-designed tables. It may not solve the purpose in real scenario, as it will create a table with the different columns that are not matching with the user's column choice.

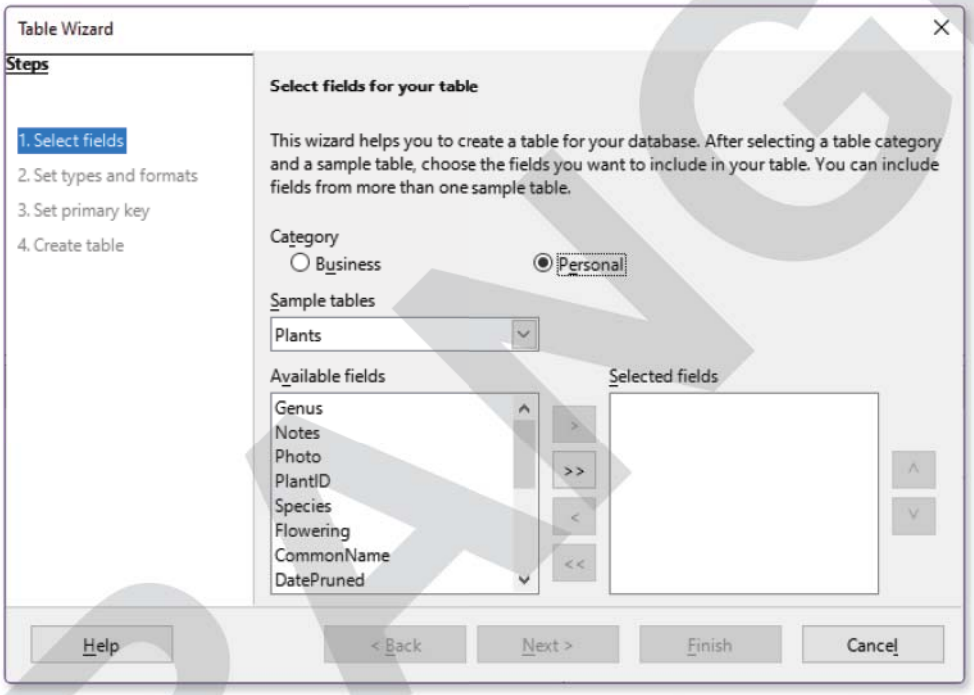
Following the given steps to create a table using wizard:

Step 1: Open the **School.odb** database.

Step 2: Select **Tables** (default) option in the **Database** pane.

Step 3: Click on the **Use Wizard to Create Table** option from the **Tasks** pane.

The **Table Wizard** will open.



This wizard contains four steps. Let us read about those steps.

Select fields: You have a choice of two categories of suggested tables: Business and Personal. Each category contains its own suggested tables from which you can choose any. Each table has a list of available fields.

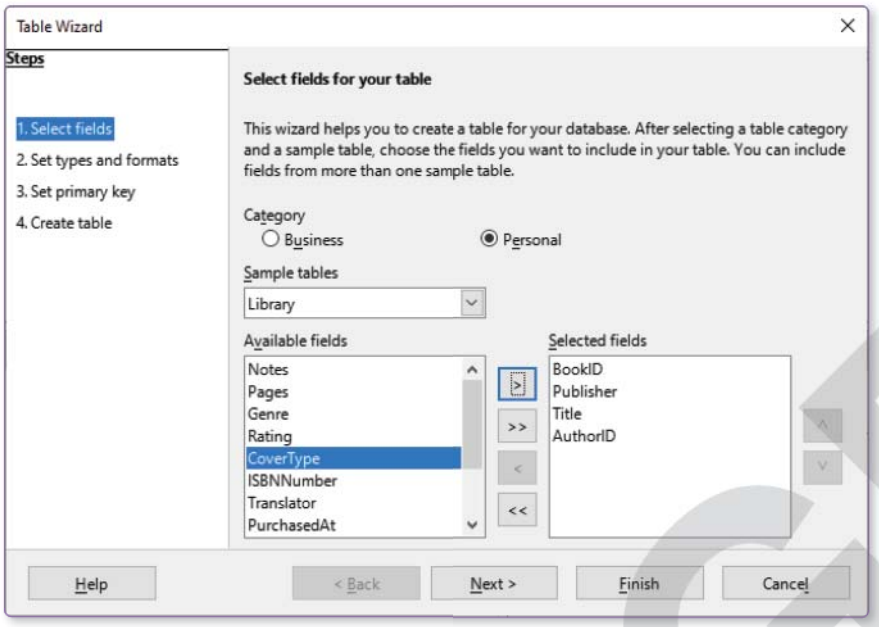
Step 4: Select the **Personal** option from the **Category** section.

Step 5: Select the desired option form the **Sample tables** drop-down menu. In this case, we have selected the **Library** option.

The fields related to the Library table is shown in the **Available fields** list box.

Step 6: Select the **BookID** option from the **Available fields** list box and click on the [>] button to move the selected field to the **Selected fields** list box.

Similarly, move the **Publisher, Title,** and **AuthorID** fields from the **Available fields** list box to **Selected fields** list box.



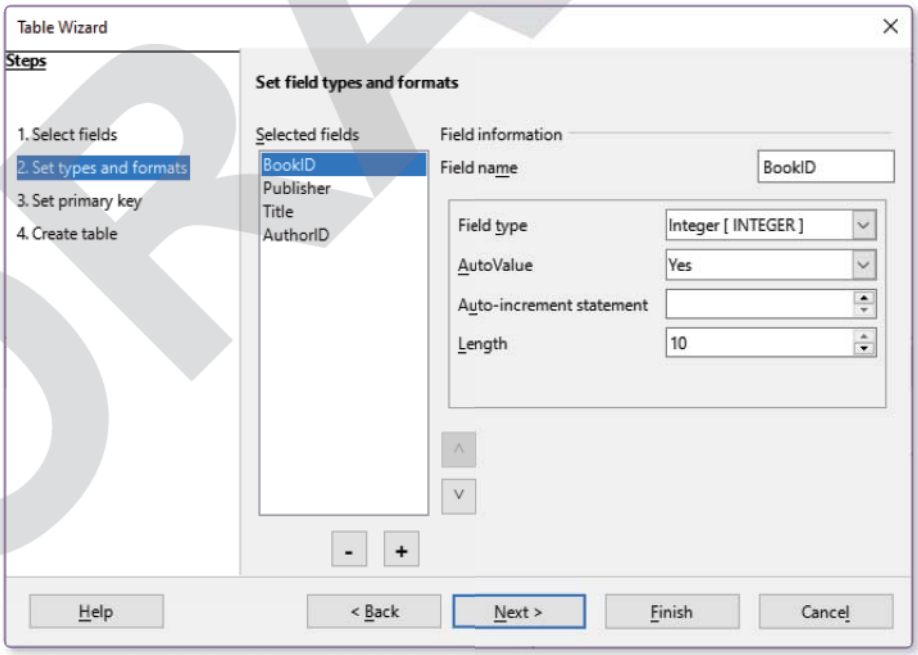
The single arrow forward [>] button helps you select one field at a time while double arrow forward [>>] button helps shift all the available fields together in one go into the **Selected fields** list box.

You can also click on single arrow backward [<] button to remove the field from the Selected fields list box and moves back to the Available fields list box or you can also click on the double arrow backward [<<] button to remove all fields from the Selected fields list box and moves back to the Available fields list box.

Step 7: Click on **Next** button to move to the next step.

Set types and formats: The selected fields can now be modified in this step. You can change the Field name, Field type, Entry required and Length.

Step 8: Do the changes in all the above selected four fields as shown below:



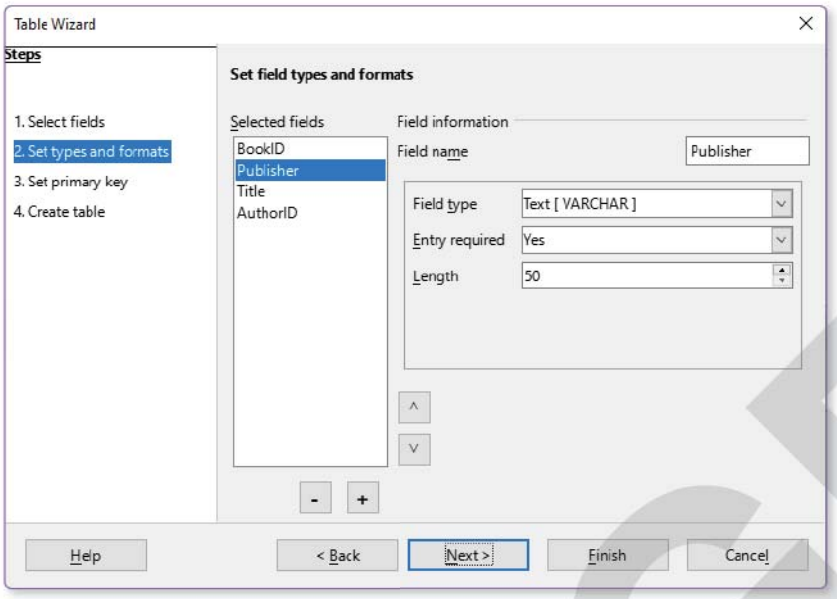


Table Wizard
Steps
1. Select fields
2. Set types and formats
3. Set primary key
4. Create table
Set field types and formats
Selected fields
BookID
Publisher
Title
AuthorID
Field information
Field name
Publisher
Field type
Text [VARCHAR]
Entry required
Yes
Length
50
Help
< Back
Next >
Finish
Cancel

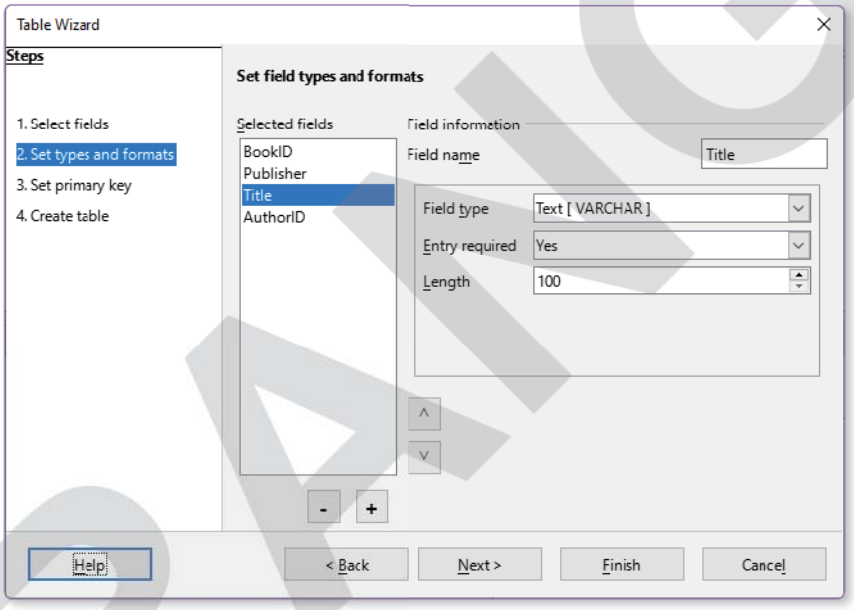


Table Wizard
Steps
1. Select fields
2. Set types and formats
3. Set primary key
4. Create table
Set field types and formats
Selected fields
BookID
Publisher
Title
AuthorID
Field information
Field name
Title
Field type
Text [VARCHAR]
Entry required
Yes
Length
100
Help
< Back
Next >
Finish
Cancel

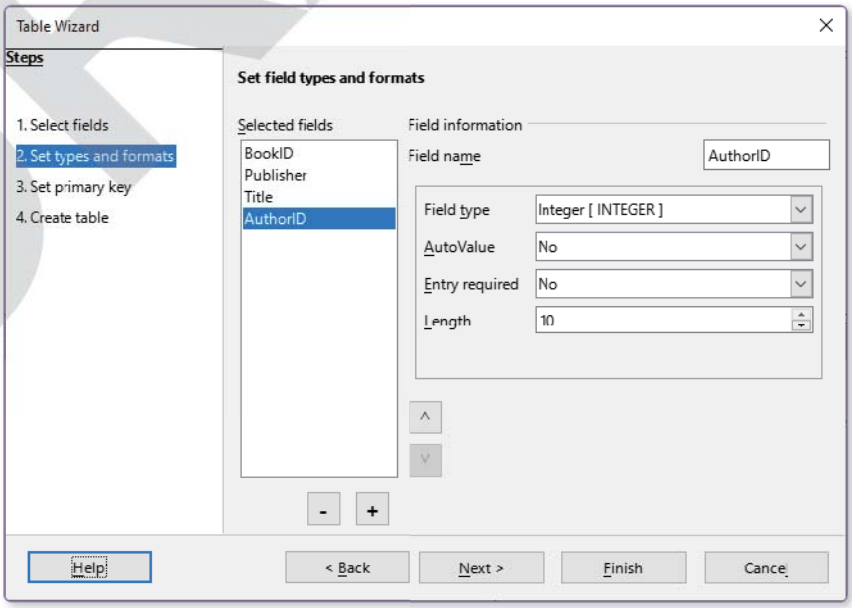


Table Wizard
Steps
1. Select fields
2. Set types and formats
3. Set primary key
4. Create table
Set field types and formats
Selected fields
BookID
Publisher
Title
AuthorID
Field information
Field name
AuthorID
Field type
Integer [INTEGER]
AutoValue
No
Entry required
No
Length
10
Help
< Back
Next >
Finish
Cancel

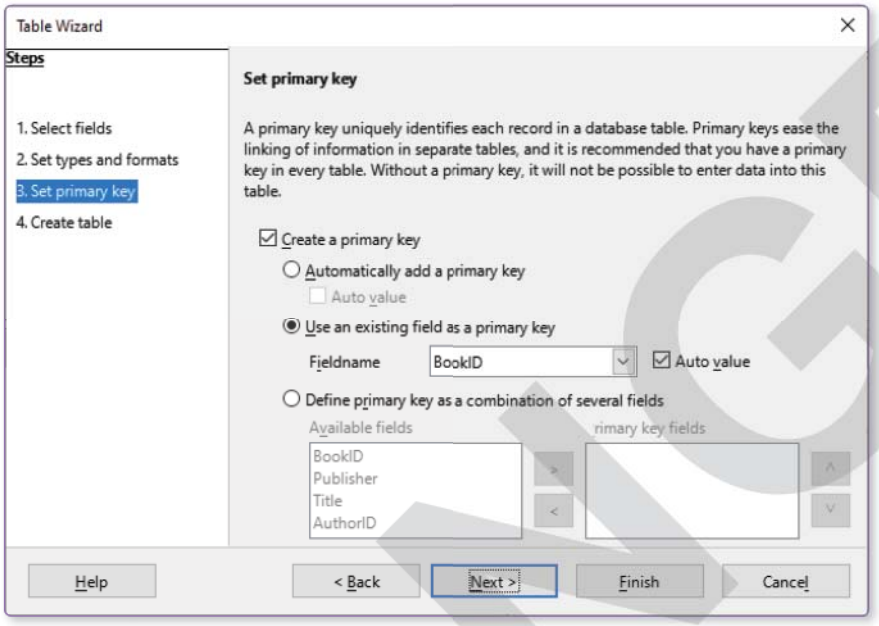
Step 9: After modifying the four fields click on the **Next** button to move to the next step.

Set primary key: In this step, you have a choice of either creating a new Primary key or using an existing field as a Primary key.

Step 10: Select the **Use an existing field as a primary key** radio button.

Step 11: Select the desired field from the Fieldname list box. In this case, we have selected the **BookID** field.

Step 12: Click on the **Next** button to move to the next step.

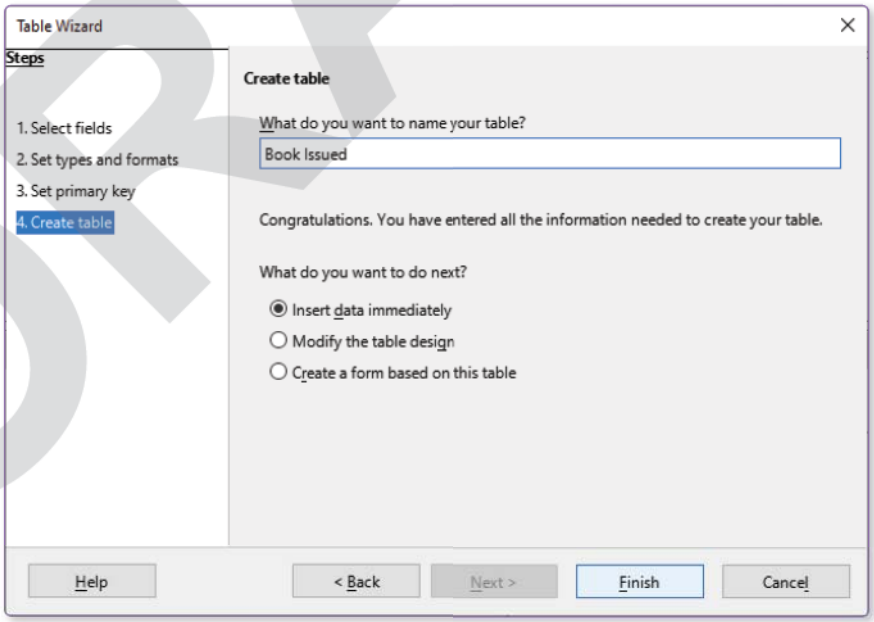


Create table: This is the final step of creating table.

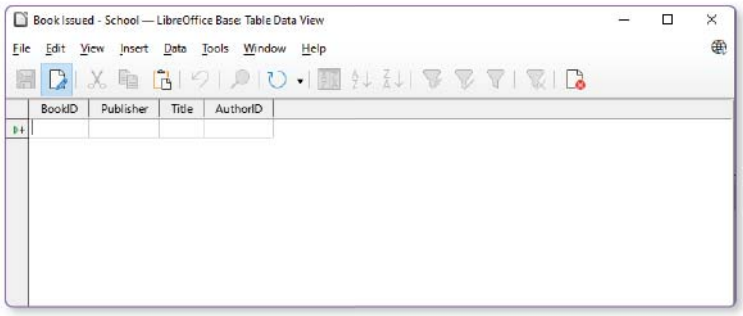
Step 13: Enter the name of the table in the **What do you want to name your table?** text box.

Step 14: Select the desired radio button in the **What do you want to do next?** as **Insert data immediately**.

Step 15: Click on the **Finish** button to end the process of creating a table through a wizard.



As, we have selected Insert data immediately so the **Books Issued** table will open in the **Table Data View** window that allows you to input new records.



Field Properties

Field properties provide extra functionality to the fields created in a table. You can set the field properties using the given different methods:

At the time of designing the structure of the table in the design view you can side by side change the field properties.

OR

Perform the following steps to modify the field property:

Step 1: Select the table.

Step 2: Right-click on table and select the **Edit** option from the context menu.

The table opens in the **Table Design** window. You can edit the structure along with the field properties.

The list of the field properties available for Numeric data types are:

- **AutoValue:** It auto increment numeric unique value that is automatically inserted in the field when a new record is added into a table. In most of the cases it's the primary key of the table. The user cannot enter data in the field that is assigned as AutoValue. It has the drop-down that contains "Yes".
- **Length:** It defines the maximum length a field can have to hold a value. This option is not allowed to modify when the Auto Value property is set to "Yes". For example, the field "Section" should be only single alphabet, the Length of the field can be "1".
- **Default Value:** It's the default value that can be assigned in the field. While data entry user can make a change in it. For example, the field "Marks", can be assigned a default value 30. This option will not be available, when the Auto Value property is "Yes".
- **Decimal Places:** It specifies the number of decimal places in a numeric field. For example, if you fix decimal places as 2 for salary then you are allowed to enter salary as 3456.78.
- **Format Example:** It allows the user to change how the data in a field will be displayed in the **Table Data View**.
- The list of the field properties available for **Character** Data types are:
- **Entry Required:** The field with Entry Required as "Yes" means that the field cannot be left blank. The user needs to enter data in this field. It contains a drop-down "Yes"/ "No". The default value for this property is "NO" which means the field if left blank will contain a NULL(nothing) value.
- **Length:** It defines the maximum length a field can have to hold a value. For example, the field "Section" should be only single alphabet, the Length of the field can be "1".
- **Default Value:** It's the default value that can be assigned in the field. This value gets automatically added in a field at the time of adding a record in a table. The user, if wants can make a change in it. For example, the field "Title", can be assigned a default value "Ms.".
- **Format Example:** It allows the user to change how the data in a field will be displayed in the **Table Data View**.

The list of the field properties available for **Character** Data types are:

- **Entry Required:** The field with Entry Required as "Yes" means that the field cannot be left blank. The user needs to enter data in this field. It contains a drop-down "Yes"/ "No". The default value for this property is "NO" which means the field if left blank will contain a NULL(nothing) value.
- **Length:** It defines the maximum length a field can have to hold a value. For example, the field "Section" should be only single alphabet, the Length of the field can be "1".
- **Default Value:** It's the default value that can be assigned in the field. This value gets automatically added in a field at the time of adding a record in a table. The user, if wants can make a change in it. For example, the field "Title", can be assigned a default value "Ms.".
- **Format Example:** It allows the user to change how the data in a field will be displayed in the **Table Data View**.

EDIT TABLE IN DESIGN VIEW

In LibreOffice Base, you can modify the structure of a table, such as adding new field, deleting existing field, changing the name and data type or properties of the field.

To edit a table, open the Database User Interface window and follow the given steps to edit the structure of a table in design view:

Step 1: Select the table STUDENT in **Table** Object.

Step 2: Right-click on table and select the **Edit** option from the context menu.

The table opens in the **Table Design** window.

Step 3: Modify the structure of the table according to your requirement.

Step 4: Click on the **Save** button after making the desired changes in the table.

INSERTING DATA IN A TABLE

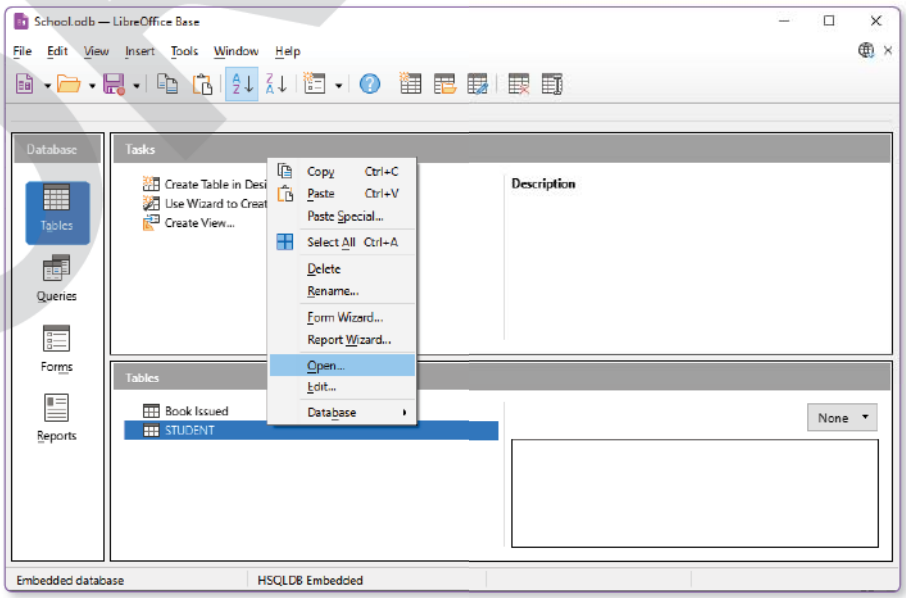
After the structure of the table is created the data can be inserted by using the given steps:

Step 1: Select the desired table in which you want to insert data as **STUDENT** table.

Step 2: Double-click on table to open it in the **Table Data View** also known as **Datasheet View**.

OR

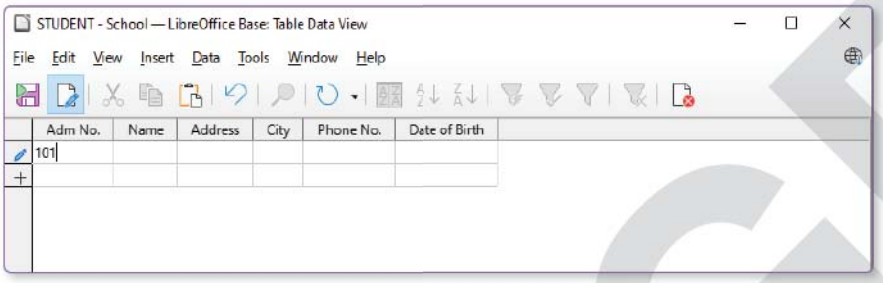
Right-click on the table and click on **Open** option from the context menu.



The STUDENT table opens in the **Datasheet View** window. This view displays the table created with the field names as the top row. These fields are displayed in the same order as they were added while creating the table. If the number of fields are more and cannot fit in the single row, you can use the horizontal scroll bar to view all the fields. The cursor will be blinking in the second row.

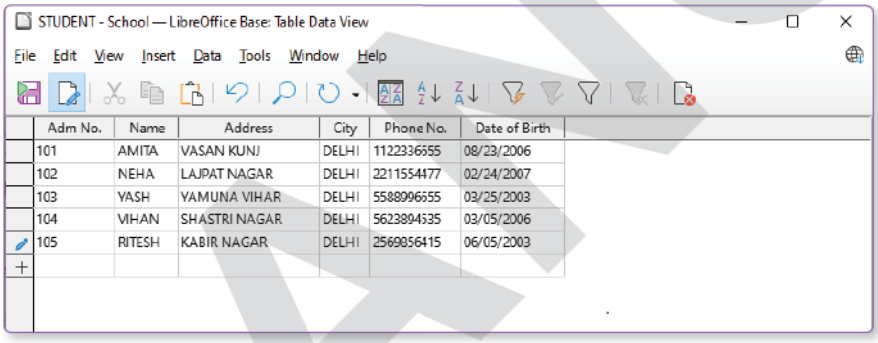
If the records are already added earlier, then, those records will also be displayed and you can add more, modify or delete the existing records.

Step 3: Start typing the value where the cursor is blinking.



Step 4: Press **Tab** key to move to next field. Once all the data values are entered for a single record, the cursor moves to the next record. This process is called **data entry**.

Step 5: Repeat **Step 3** and **4** add more data in the fields of the table.



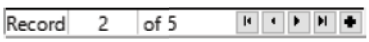
Step 6: Click on the **Save current record** button to add the record in the table.

Step 7: Click on the **Close** button to close the **Datasheet View** window.

NAVIGATING RECORD IN A TABLE

There is a pointing arrow in a table, known as record pointer, that is used to specify the current position or selection within a table. It indicates which record is currently active or being operated in the table. To navigate through various records of the table, we use the navigation box present at the bottom of the datasheet window. Th Navigation Box is made up of two components:

- **Record Selector text box:** This text box displays the currently active record number. You can input the desired record number into this box to select and make it an active record in the Datasheet View.



- **Navigation Buttons:** You can click on these buttons to navigate through the records. The These buttons allow you to move in a table as given below:
  - The button is used to move to the first record in the table.
  - The button is used to move to the previous record based on the currently selected recording the table
  - The button is used to move to the next record based on the currently selected record in the table.
  - The button is used to move to the last record in the table.

INFO MAIL

Subject: Navigating Record

You can also navigate to the record by directly clicking the row head of a particular row in the table.

Editing Record in the Table

The records once entered can be edited anytime in a table. Follow the given steps to edit the records:

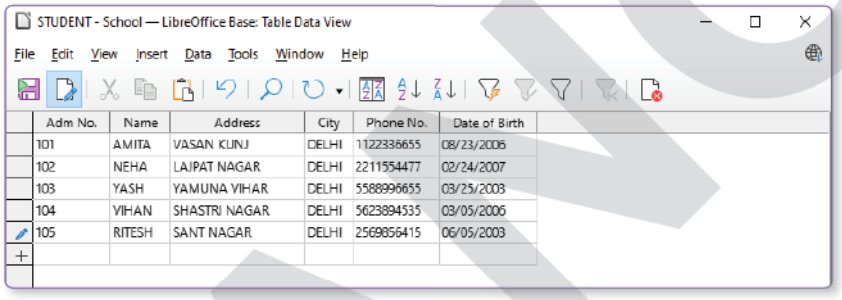
Step 1: Select the STUDENT table.

Step 2: Double-click on the table (STUDENT table) whose record you want to edit.

STUDENT table opens in the **Table Data View/Datasheet View** window.

Step 3: Select the cell that you want to modify.

Step 4: Make the required changes in the cell. In our case, we have modified the address from KABIR Nagar to SANT NAGAR of the student whose admission number is 105.



Step 5: Click on the **Save current record** button to save the modification.

Step 6: Click on the **Close** button to close the **Table Data View** window.

Deleting the Record from the Table

Any record if not needed can be permanently removed from the table by deleting it. Follow the given steps to delete the record from the table:

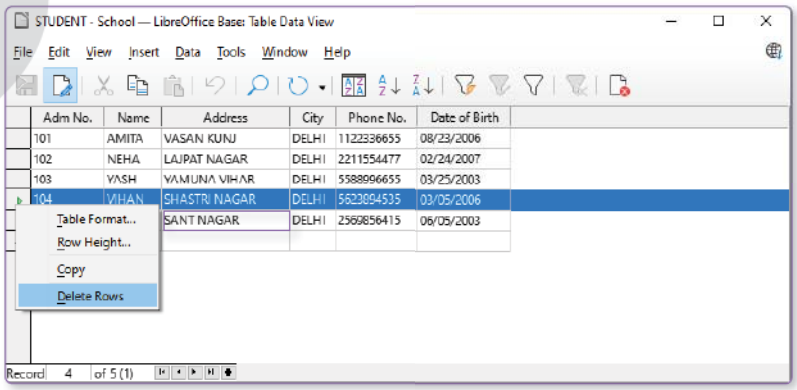
Step 1: Select the STUDENT table.

Step 2: STUDENT table opens in the **Table Data View** window. Select the record you wish to delete.

Step 3: Click on **Edit** → **Delete Record** option from the menu bar.

OR

Right-click the selected record and select the **Delete Rows** option from the context menu.



The **Confirmation** dialog box opens.

Step 4: Click on the **Yes** button in the **Confirmation** dialog box to proceed with deleting the record.

You may select multiple records by using the **Shift key** (for records that are arranged adjacent to each other to form a consecutive list) or **Ctrl key** (for records scattered at different places in a table) and then select the **Edit → Delete Record** option from the menu bar to delete multiple records at a time.

Sorting the Data in the Table

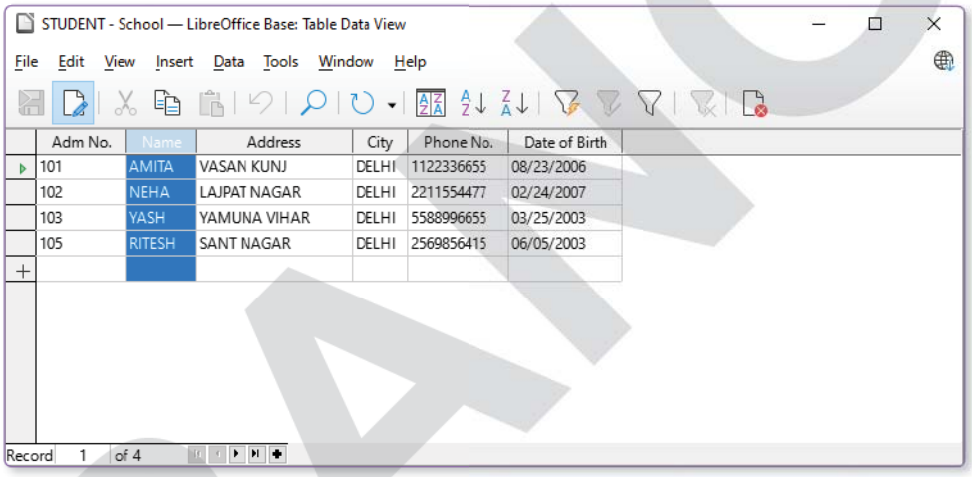
Sorting means rearrangement of the data either in the ascending order (smaller value to bigger value) or in the descending order (bigger value to smaller value). The records will be rearranged with respect to the sorted field.

The steps to sort the table are as follows:

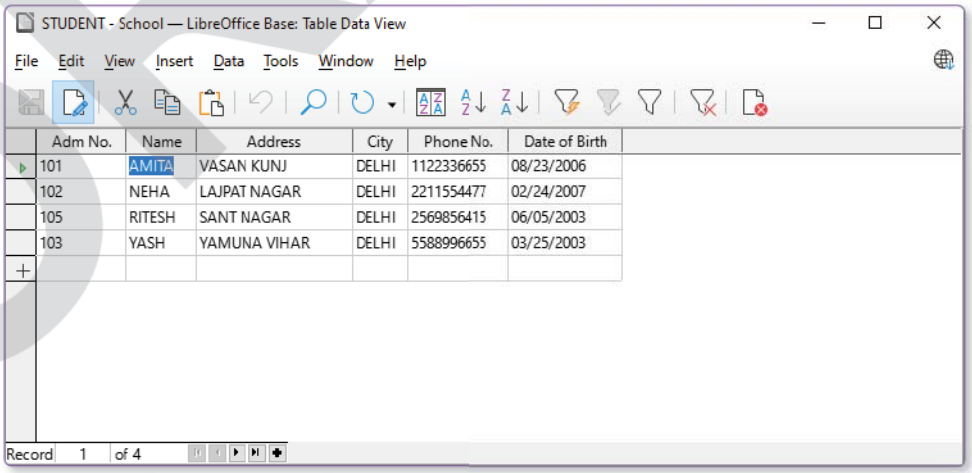
Step 1: Select the STUDENT table.

Step 2: The STUDENT table opens in the **Table Data View** window.

Step 3: Click on the column header based on which you want sort the data. Let us sort the data based on the Name column. So, click on the column header of the Name column, you will see the whole column is selected by shading it with blue.

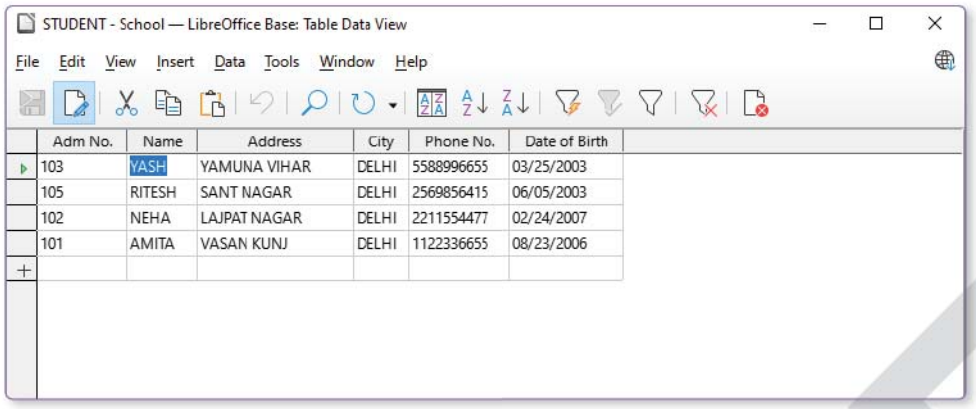


Step 4: Click on the **Sort Ascending** button ( ) to sort data in ascending order. All the records will be rearranged in the ascending order of the Name.



OR

Click on the **Sort Descending** button ( ) to sort data in descending order. All the records will be rearranged in the descending order of the Name.



Adm No.	Name	Address	City	Phone No.	Date of Birth
103	YASH	YAMUNA VIHAR	DELHI	5588996655	03/25/2003
105	RITESH	SANT NAGAR	DELHI	2569856415	06/05/2003
102	NEHA	LAJPAT NAGAR	DELHI	2211554477	02/24/2007
101	AMITA	VASAN KUNJ	DELHI	1122336655	08/23/2006

The **Sort Ascending** and **Sort Descending** button sorts the data by one criterion only. LibreOffice Base allows you to combine several criteria by selecting Sort icon on the toolbar. The Sort Order dialog can be used to do the required changes, perform the following step for the same:

Step 1: Click on the **Sort** icon ( ) on the toolbar.

The **Sort Order** dialog box opens, as shown below:

Step 2: Select the **Field name** and **Order** from the drop-down list.

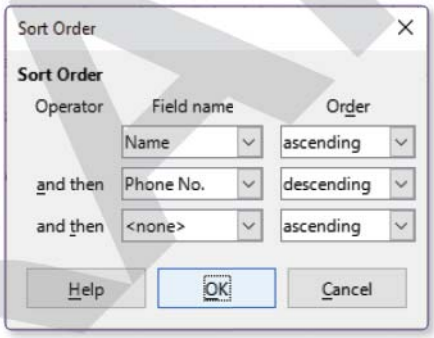
Step 3: Click on the **OK** button.

If you wish to sort one field within another field, then use **Sort Order -Then**.

For example, if the Name is stored as Name and Address, then we can sort Address within Name by specifying:

Sort Order- **Field Name** = Name, **Order** - Ascending

Then - **Field Name** = Phone No., **Order** – Descending



Quiz Bee

1. Your neighbourer-Amit has a flower shop. He maintained the details of his customers personal information, order details and stock details manually. Now he wants to maintain them in a computer using a database. Help him create a Database with the appropriate 3 tables.
   - Give a name to the database.
   - Design the fields and their data types of all the three tables-customers personal information, order details and stock details.
   - Name the primary keys of all the three tables.
2. Save the above created table without creating a Primary key. Double click on the STUDENT table tab and try to enter a few records. Are you able to create records without making a primary key? Also if you wish to make Adm No now as a primary key are you able to edit the already created table structure? Give steps to do so.

DELETING A TABLE

Follow the given steps to delete a table:

Step 1: Select the table that you want to delete.

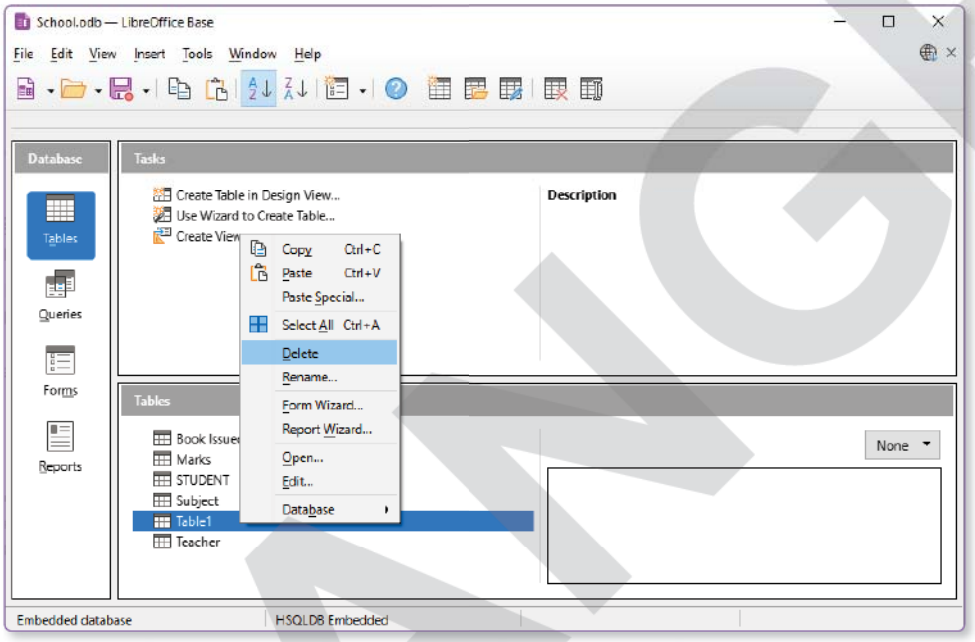
Step 2: Select the **Edit → Delete** option from the menu bar.

OR

Press the **Delete** key from the keyboard.

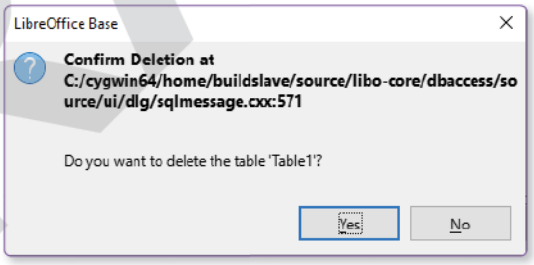
OR

Right-click the table and select the **Delete** option from the context menu.



The **LibreOffice Base** dialog box opens for confirming the deletion.

Step 3: Click on the **Yes** button to confirm the deletion.



The selected table will be deleted from the database.

RENAMING A TABLE

Follow the given steps to rename a table:

Step 1: Select the table that you wish to rename.

Step 2: Right click on the table name in the Table Area and select **Rename** option from the pop-up menu.

A cursor will appear.

Step 3: Type the new name and press the **Enter** key.

CLOSING LIBREOFFICE BASE

To close the application window of LibreOffice Base, click on the **File > Close** or click on the **cross (x)** button of the LibreOffice Base window.

WHAT ARE RELATIONSHIPS?

As we know, a database contains different related tables. Sometimes, we need data from different tables at the same time. In such cases, these tables need to be linked based on a common field.

Relationships help you join two or more tables using a common field so that common data can be retrieved from multiple tables at the same time.

The most important prerequisite for setting a relationship is that there must be a common field(s) between the two tables to create a relationship. Also ensure that the data types of the common field in both the tables must be same. If they are not same then LibreOffice Base will display an error message and will not allow to set the relationship between the two tables.

Let us consider an example of a database containing following two tables—STUDENT and MARKS

In STUDENT table - AdmNo is the primary key. In MARKS table - RollNo is the primary key and AdmNo is the foreign key. So, each record in STUDENT table has a value of AdmNo that corresponds to a record in MARKS table with same value of AdmNo.

Table: Student

AdmNo	Name	Class	Address
1011	Arshia	12	RK Puram
1231	Advika	12	Defence Colony
1411	Aekagra	10	Safdarjung
1422	Divit	9	Preet Vihar
1324	Akshaj	11	Jasola

Table: Marks

RollNo	Admno	UT Marks	Term 1 Marks	Term 2 Marks
1	1231	89	81	91
2	1411	80	85	92
3	1324	78	87	91

Once the relationship between the two tables has been set, the integrity of data will be managed by the DBMS. That means once a student's record has been entered in the STUDENT table, only then that Admission Number can be entered in the MARKS table. Thus, STUDENT table is called **MASTER TABLE** with **master record** while the MARKS table is called the **TRANSACTION TABLE** with the corresponding record matching with master record is called as **transaction record.**

The main advantages of Relating Tables in a Database are:

- A relationship can help prevent data redundancy and it saves time as the common data need not to be repeated in different tables.
- It helps prevent missing data by keeping deleted data from getting out of sync. This is called referential integrity.
- Creating relationships between tables restricts the user from entering invalid data in the referenced fields.
- Any update in the master table is automatically reflected in the transaction tables.

Types of Relationships

There are three important types of relationship that can be created in a database which are as follows:

- **One-to-One:** In this type "One record of Master table is related to only one record of Transaction Table". It is represented as a 1:1 relationship.

Let us understand the concept of **One-to-One** relationship with the help of example.

Person Table

PersonID (Primary Key)	Name	Age	Address
1	Yash	30	Delhi
2	Mehul	28	Meerut
3	Varun	32	Delhi
4	Neetu	31	Kanpur

Passport Table

PassportID (Primary Key)	PassportNumber	ExpiryDate	PersonID (Foreign Key)
101	A12345	2026-05-15	1
102	B67890	2027-03-20	2
103	A25689	2026-05-15	3
104	C25874	2027-03-20	4

In the given relationship, each person has exactly one passport, and each passport belongs to exactly one person. So, the relationship between Person and Passport tables is one-to-one.

- **One-to-Many:** This is one of the most common types of relationship between the tables in a database. In this type "Each record of Master table is related to multiple Records of Transaction table." It is represented as a 1:n relationship.

Let us understand the concept of **One-to-Many** relationship with the help of example.

Department Table

DeptID (Primary Key)	DeptName	Location
1	Engineering	Sonipat
2	Marketing	Meerut
3	Sales	Delhi

Employee Table

EmployeeID (Primary Key)	Name	DeptID (Foreign Key)
101	Yash	1
102	Mehul	1
103	Varun	2
104	Neetu	3
105	Nisha	2

In the given relationship, each department can have many employees, but each employee belongs to only one department. So, the relationship between Department and Employee tables is One-to-Many.

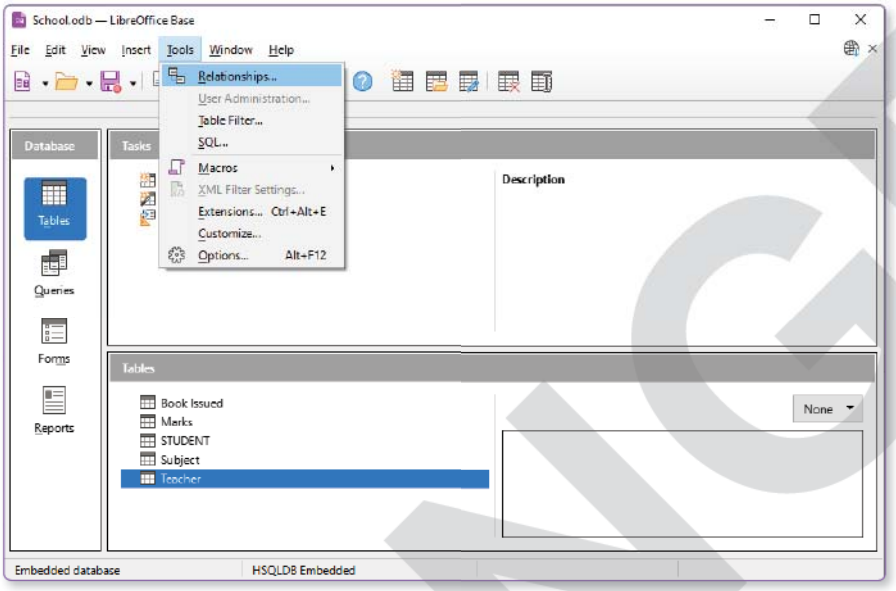
- **Many to Many:** In this relationship, "Multiple records of Master table is related to multiple records of Transaction table". Generally, this type of relationship is set when certain records must be saved more than once in both the related tables. It is represented as a n:n relationship.

In the above tables ONE TEACHER can teach MANY SUBJECTS. ONE SUBJECT is taught by MANY TEACHERS. Similarly, a shopkeeper may sell multiple products to multiple customers. So **Many-to-Many** relationship exists between a product and a customer.

Creating a Relationship

Steps to create a relationship between tables are as follows:

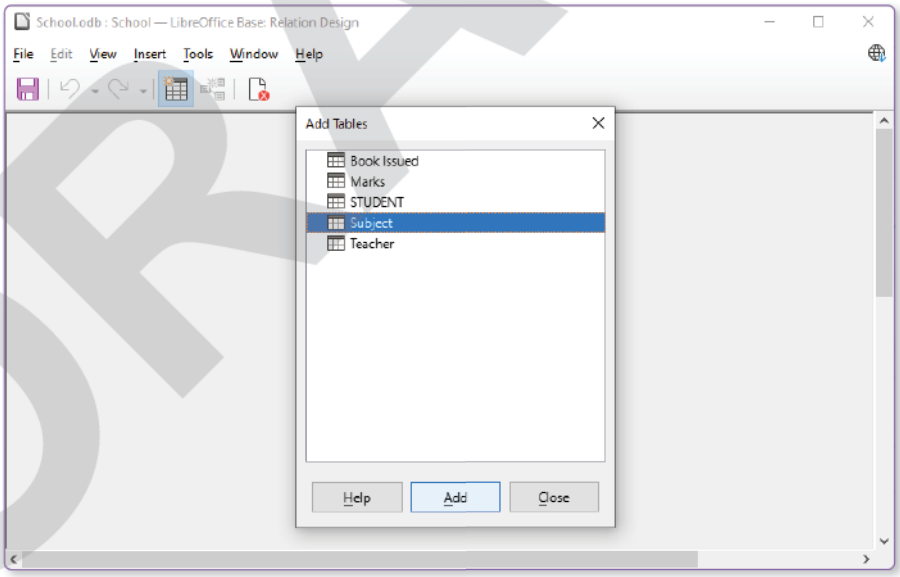
Step 1: Select the **Tools** → **Relationships** option from the menu bar.



The **Relation Design** window opens with the **Add Table or Query** dialog box.

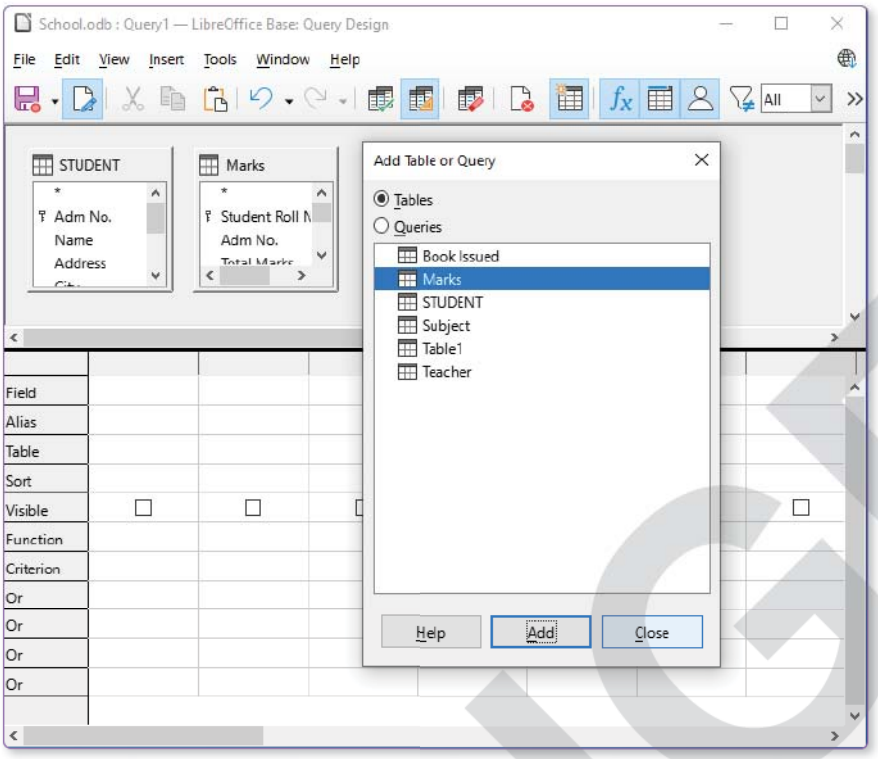
Step 2: Select the table that you want to add in the relationship as **Subject**.

Step 3: Click the **Add** button in the **Add Table or Query** dialog box.

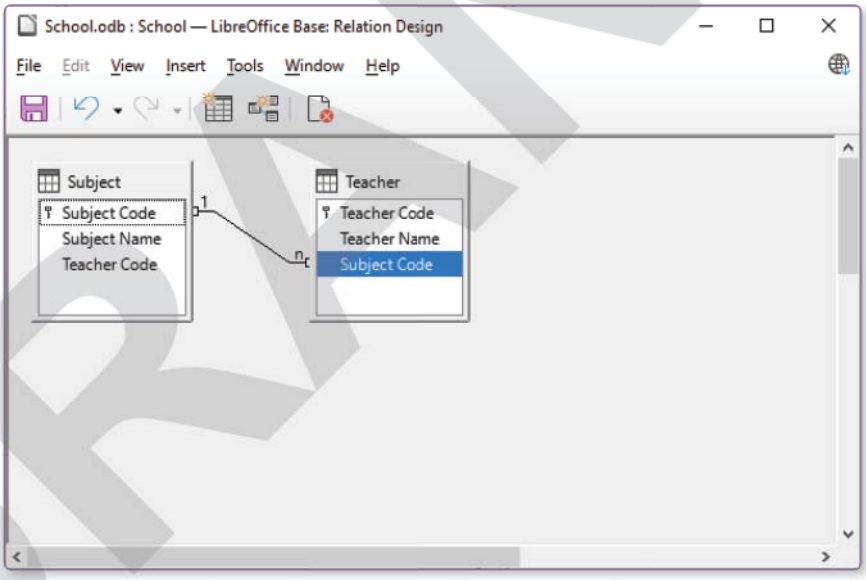


Similarly, you can add more tables. In this case, we have added the **Teacher** table.

Step 4: Click the **Close** button in the **Add Table or Query** dialog box.



Step 5: Click on **Subject Code** in **Subject** table and drag it to the **Subject Code** in **Teacher** table. Release the button to see a relationship between tables, as shown below:



REFERENTIAL INTEGRITY

Referential integrity is a fundamental rule in relational databases that ensures the consistency and validity of relationships between tables. It deals with the rule that values of Foreign key in one table is derived from the values of primary key in another table to ensure that this relationship between two tables will provide accurate and consistent data. In other words, no data which serves as a link between two tables is either deleted or changed by mistake.

Once the relationship between the two tables has been set, the integrity of data will be managed by the DBMS. LibreOffice Base will allow only that corresponding record to be entered in the transaction table which already exists in the master table.

Referential Integrity helps in the following conditions:

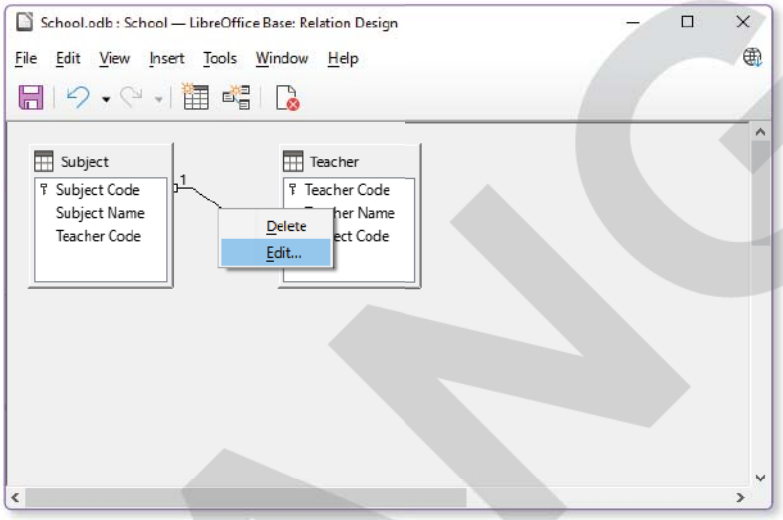
- Whenever a new record is added in a table with the foreign key then it ensures that the value added should exist in a primary key of the other linked table.
- Update or deletion in the Table with the primary key is not allowed if the matching record exists in the foreign key of the other table.

Edit Relationship

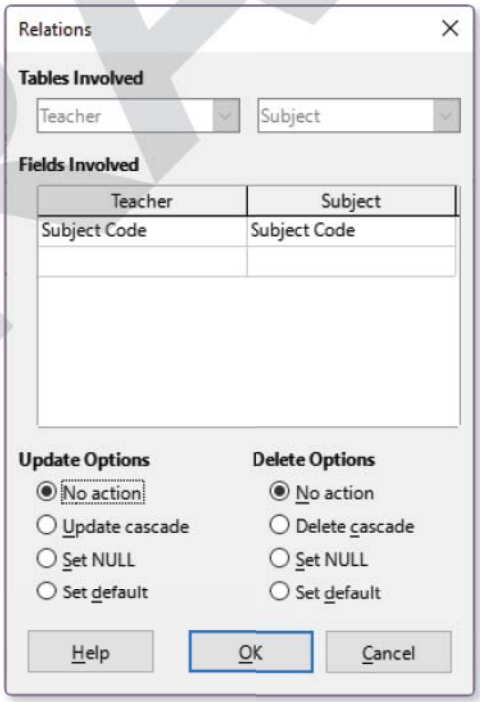
Editing relationships in Base involves modifying existing connections between tables to meet evolving database requirements.

The steps to edit a relationship are as follows:

Step 1: Right-click on the relationship thread and select the **Edit** option.



The **Relations** dialog box opens.



The **Relations** dialog box gives four options for maintaining referential integrity. These options are as follows:

- **No action:** This option, set as the default, prohibits users from updating or deleting any record in the master table if related records exist in the transaction table.
- **Update cascade:** This option enables users to update or delete the referenced field, causing all related records in any of the transaction tables to also be updated or deleted.
- **Set NULL:** With this option, if the master record is deleted or updated, all related fields are assigned a NULL value.
- **Set default:** This option assigns a predetermined default value to all related fields if the master record is deleted or updated.

Step 2: Select the tables in the **Tables Involved** section

Step 3: Select the fields from the tables in the **Fields Involved** section to modify the relationship.

Step 4: Click on the **OK** button.

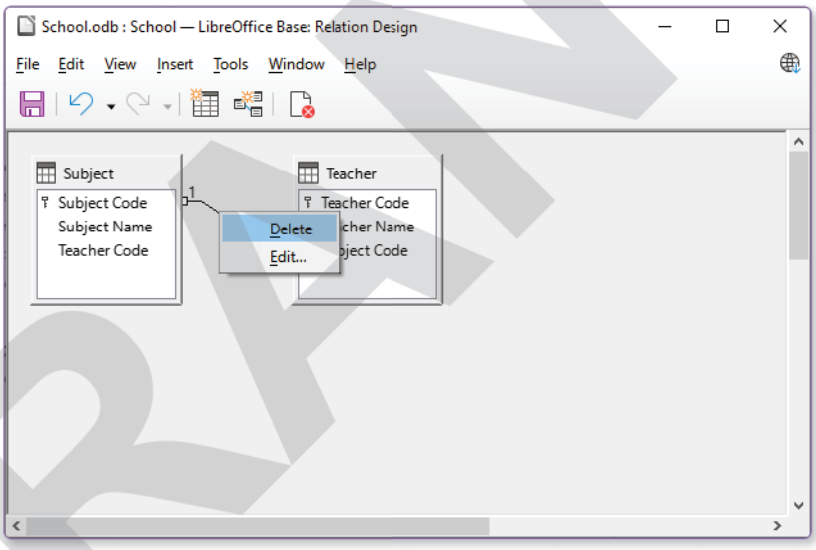
Deleting the Relationship

Relationship once created can be easily removed by deleting them using the given steps:

Step 1: Click on **Tools** menu. A drop-down menu will appear.

Step 2: Select **Relationships** option from the menu. The **Relationship** window will appear.

Step 3: Right-click on the relationship thread and select the **Delete** option.



The relationship between tables will be removed thus showing that now the two tables are not related.

Create a database Library with the tables - Books in stock, Books issued, Books lost/ damaged.

1. Design the structure of all the 3 tables with the primary key, foreign key.
2. Link the three tables and name the relationships, if possible, between different tables in a database.
3. Can a referential integrity be set between Books in stock and Books issued? If yes, explain the concept with reference to the given two tables.
4. Give the steps to delete a relationship in the LibreOffice Base.

Query is a set of commands that retrieve and display data from one or more tables in a database. This is done by giving specific search criteria to the DBMS so that we can view the exact information that we want. The result of the query is displayed in tabular form with field names in columns and the records in rows.

A query is of great help when information is required to be extracted from different tables. It uses the process of filtering the information based on the criteria from the table.

Filtering can be defined as the process of using a query to filter the records based on the criteria so that only the records matching the criteria will be available to the user thus hiding the data which is not needed.

LibreOffice Base allows us to create a query using Structured Query Language and even save it as an object in a database. This helps to run the query multiple times as and when required.

Creating a Query

To steps to create a query is to select the **Query** object in the Database pane. There are three different methods used to create a query in the LibreOffice Base. These are:

- Create Query in Design View
- Use Wizard to Create Query
- Create Query in SQL View

Creating a Query in Design View

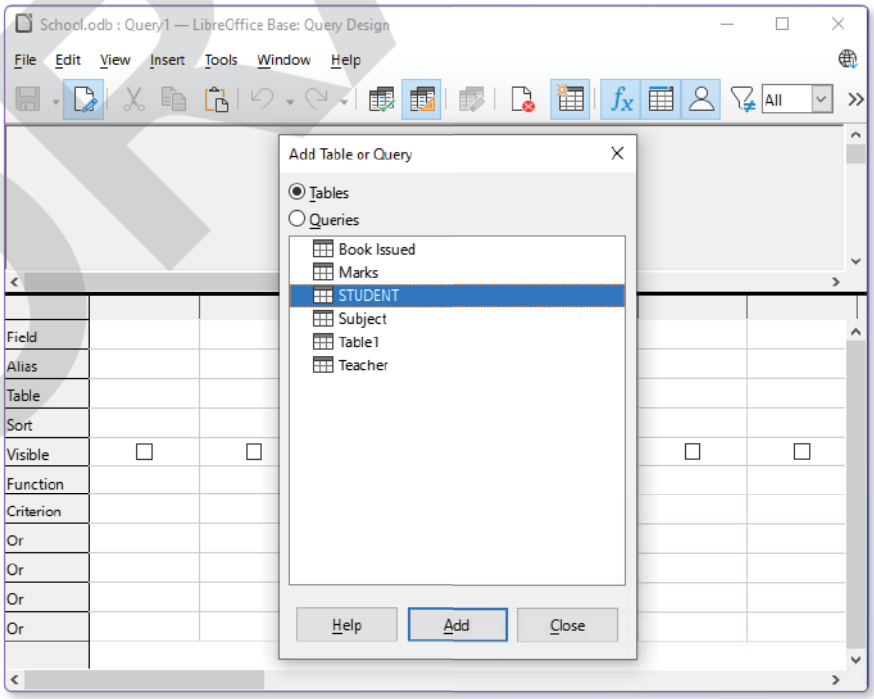
A design view helps you design a query by specifying the tables and the criteria. Let us design a query to display the list of students with their marks. The query will have – Adm No., Name from STUDENT table and Total Marks, Grade, and Percentage from the MARKS table.

The steps to design a query using a Design view are as follows:

Step 1: Select the **Queries** icon on the **Objects Pane** in the **Database Window**.

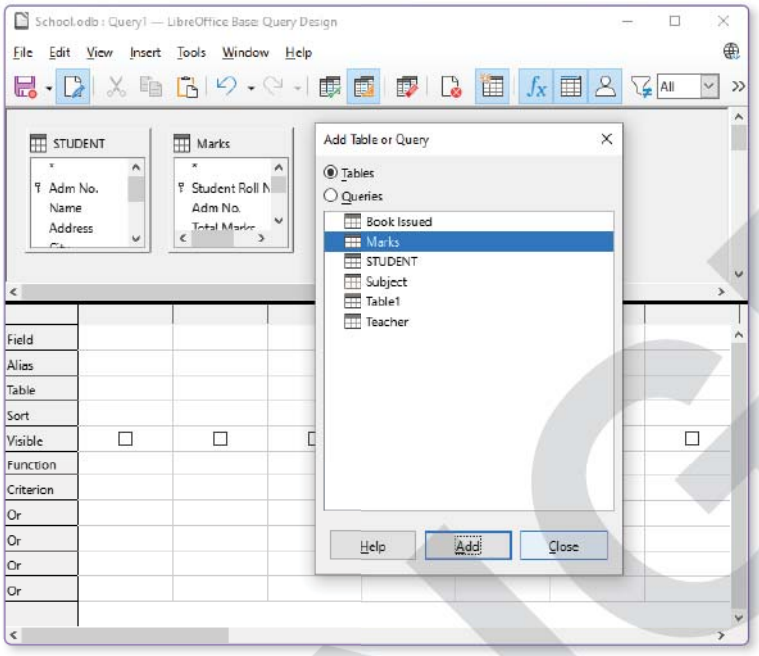
Step 2: Select the **Create Query in Design View** option under the **Tasks** pane.

The **Query Design** window open with the **Add Table or Query** dialog box.

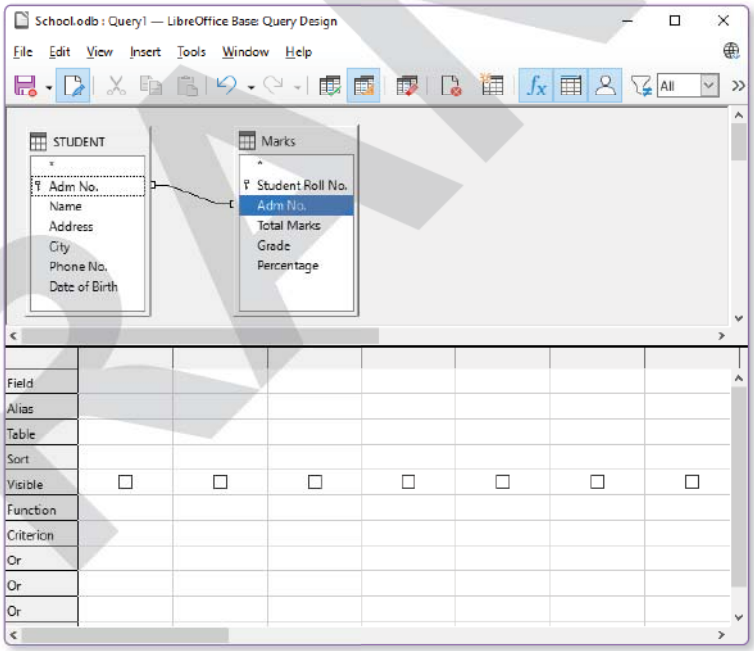


Step 3: Add the tables you wish to use in the query. In this case, we have added two tables named STUDENT and MARKS.

Step 4: Click the **Close** button in the **Add Table or Query** dialog box.



Step 5: Create one to one relationship using the **Adm No.** field.

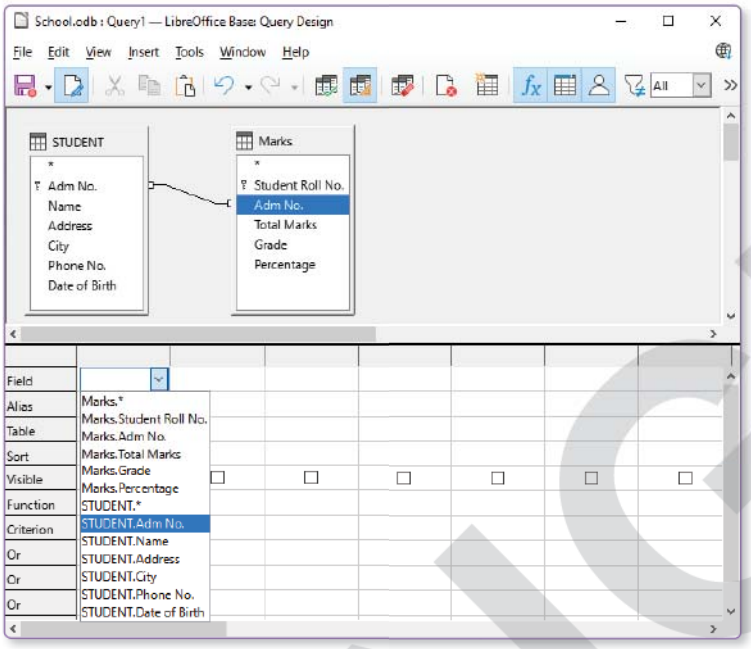


The query design view has two sections - upper action has tables to be used to design a query. The lower section is the design query grid with parameters where you specify:

- **Fields:** Displays the selected fields in the output of the given query.
- **Alias:** Give another name to the field in the output window.
- **Table:** Table from which the field is to be selected.
- **Sort:** If the field is to be arranged in ascending or descending order.
- **Visible:** If selected the field will be displayed in the output window.
- **Criterion:** The condition for the rows to be displayed.

Step 6: Click on drop-down arrow key in front of the **Field** option. A drop-down list appears.

Step 7: Select the desired field from the respective tables in the drop-down list. In this case, we have selected the **Adm No.** field of the **STUDENTS** column, as shown below:



Step 8: Repeat step 7 and 8 to add more fields. In this case, we have added the following fields:

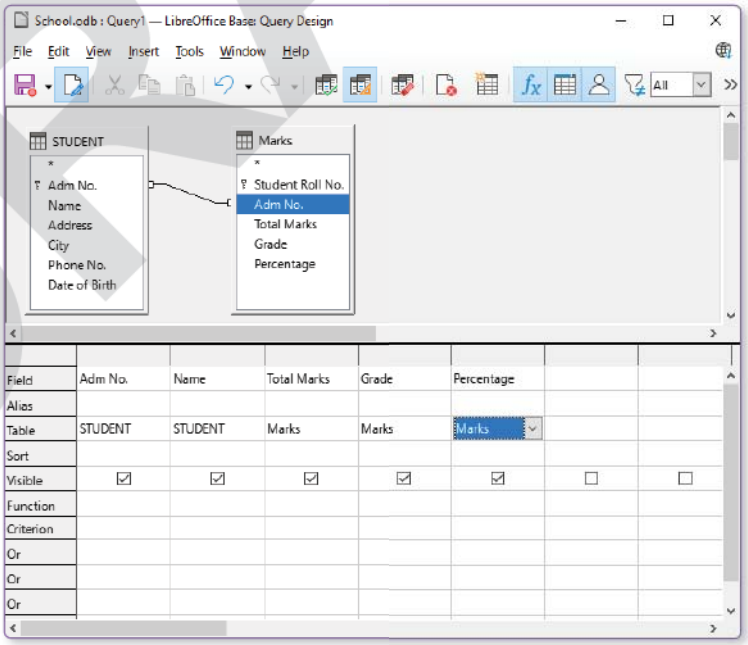
Name field of the **STUDENTS** column

Total Marks field of the **Marks** column

Grade field of the **Marks** column

Percentage field of the **Marks** column

Step 9: When you click on the column beside the **Table** then the column fills automatically based on the selected fields.



Step 10: Select the **File** → **Save As** option from the menu bar to save the query.

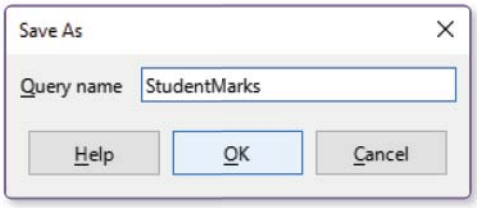
OR

Click on the **Save** button in the tollbar.

The **Save As** dialog box appears with the default query name as **Query1.**

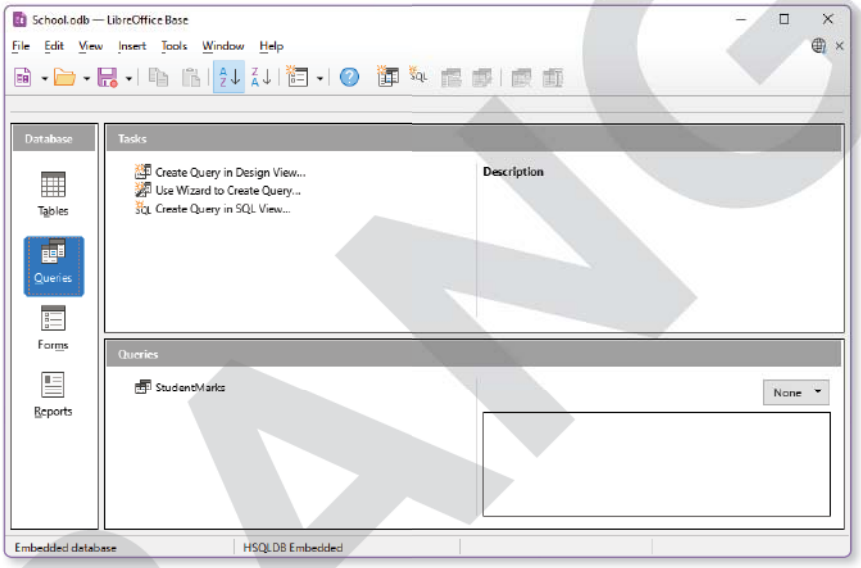
Step 11: Type the name of the query in the **Query name** text box.

Step 12: Click on **OK** button.



Step 13: Click on **File** → **Close** option from the menu bar to close the Query Design window.

The **StudentMarks** query will appear under the **Queries pane** in the **Database** window as shown below:

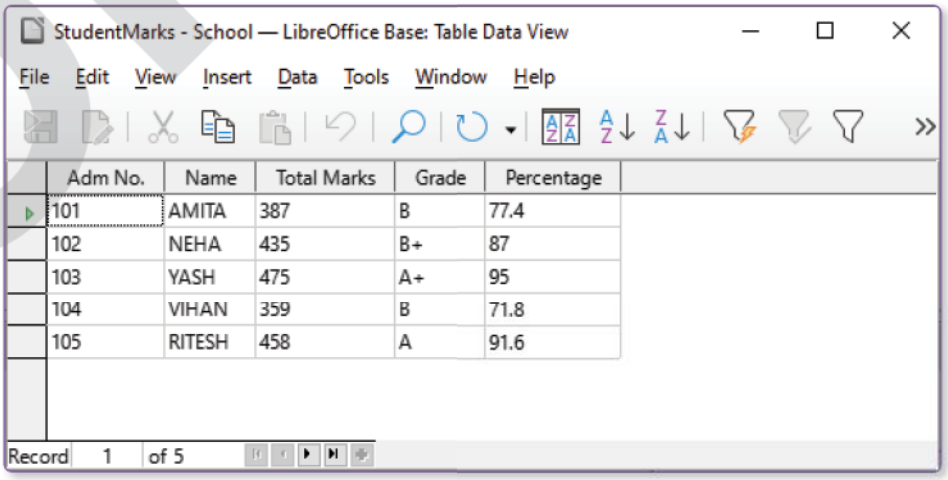


Step 14: Double-click on the **StudentMarks** query to run it.

OR

Right-click on the **StudentMarks** query and select the **Open** option from the context menu.

The output window with the **StudentMarks** query will be displayed as shown below:



Adm No.	Name	Total Marks	Grade	Percentage
101	AMITA	387	B	77.4
102	NEHA	435	B+	87
103	YASH	475	A+	95
104	VIHAN	359	B	71.8
105	RITESH	458	A	91.6

To run a query in the **Query Design** window, click on the **Run Query** button in the toolbar or press the **F5** key from the keyboard.

PURE FACT

Creating a Query using Wizard

Wizard is an easy way that guides you through the step-by-step process of creating queries. Follow the given steps to create a query using a wizard:

Step 1: Select the **Queries** database object in the **Database** pane

Step 2: Select the **Use Wizard to Create Query** option under the **Tasks** pane.

The **Query Wizard** dialog box appears with eight Steps Pane on the left and the Query Details Area on the right.

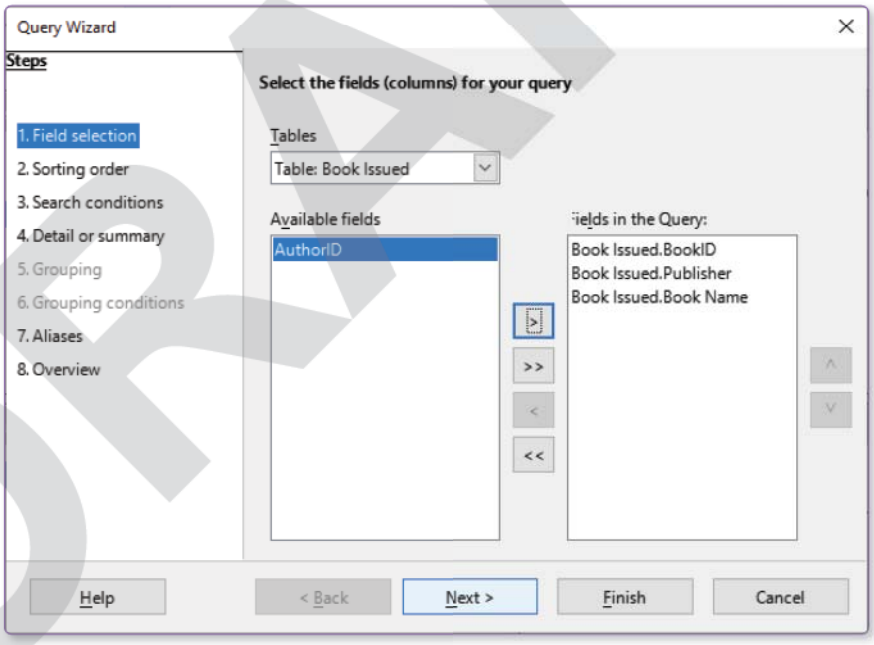
Step 3: **Field Selection:** Select the **Table** on which you want to create a query and the **Available Fields** of the table.

In this case, we have selected the **Book Issued** table. The field of the selected table displays in the **Available fields** list box. Select the **BookID** option from the **Available fields** list box and click on the > button to move the selected field to the **Selected fields** list box.

Similarly, move the **Publisher**, **Book Name** fields from the **Available fields** list box to **Selected fields** list box.

Note that once the fields are added they can be moved up and down in order by clicking ^ and v buttons present on the extreme right of the wizard.

Click on the **Next** button to move to the next step of the wizard.



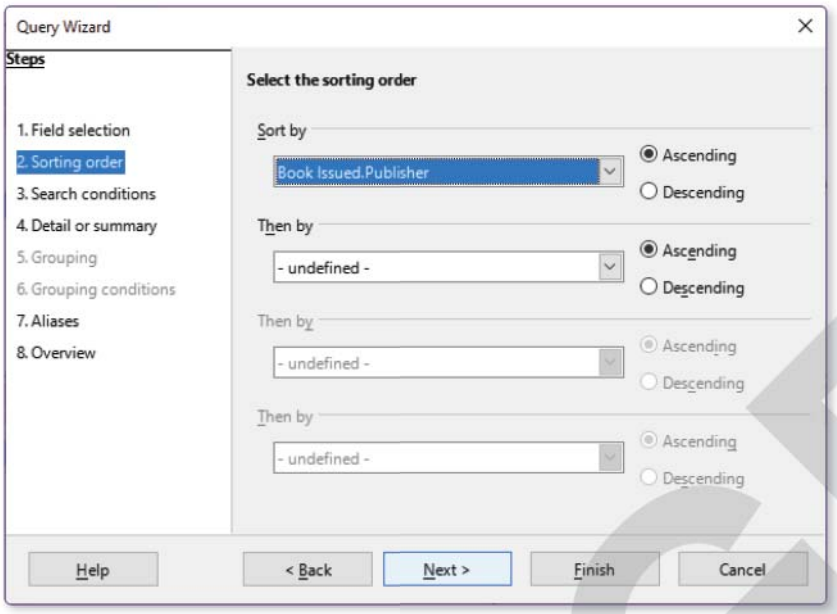
Step 4: **Sorting Order:** This step helps you select the sorting order field. The result of the query can be displayed in ascending or descending order of any particular field you selected in this step.

Do the following changes:

Sort By: Book Issued.Publisher

Order By: Ascending

Click on the **Next** button to move to the next step of the wizard.



Step 5: **Search Conditions:** This step is to set the search conditions, or the criteria based on which records will be filtered from the table. This is the step where actually the query is set up or the criterion is given to the database.

Select the search criteria for the query by clicking on the **Match all of the following** or **Match any of the following** radio button. In this case, we have selected the **Match any of the following** radio button

Specify the following search criteria:

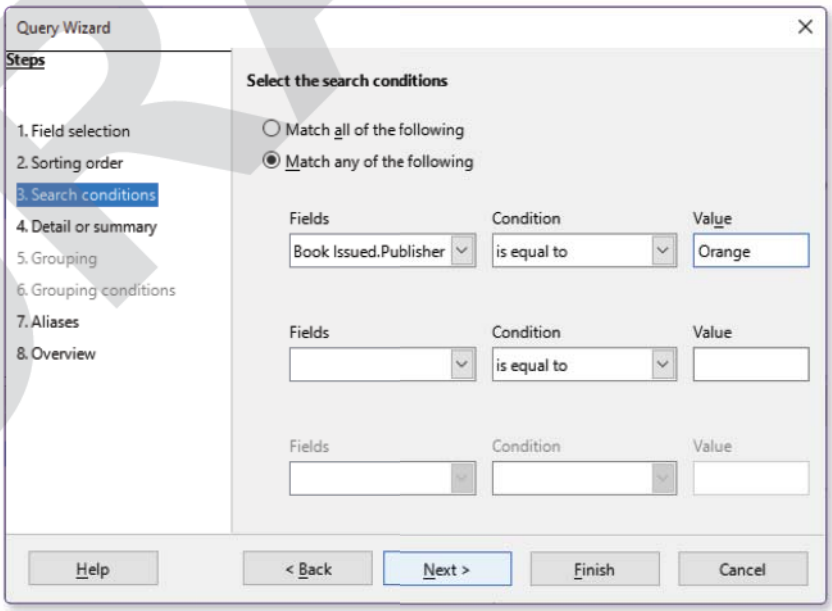
Field: Book Issued.Publisher

Condition: is equal to

Value: Orange

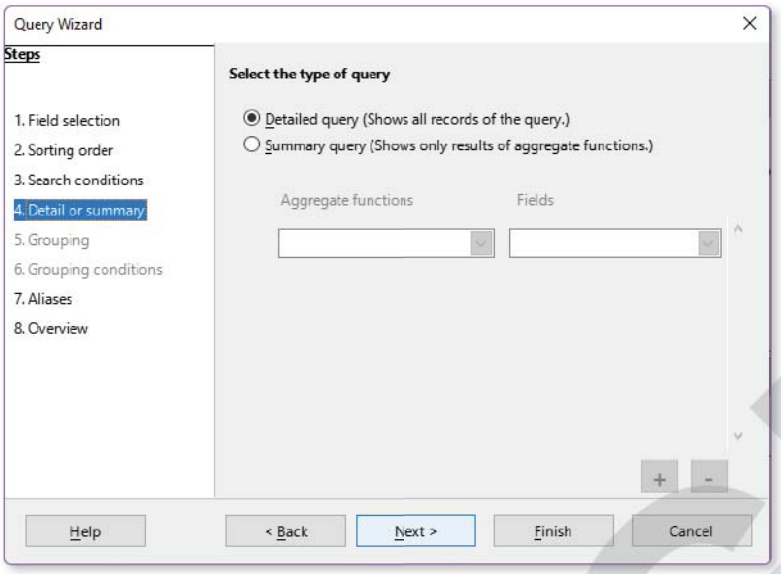
This will create a query where only the books from Orange Publisher will be displayed because of the query.

Click on the **Next** button to move to the next step of the wizard.



Step 6: **Detail or summary:** In this step you **Select the type of query** as **Detailed query** radio button.

Click on the **Next** button to move to the next step of the wizard.

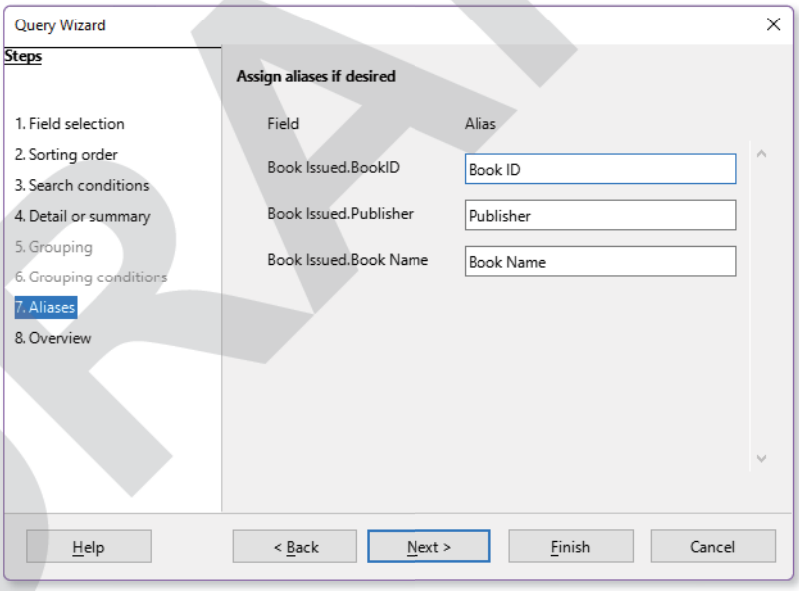


Step 7: **Grouping and Grouping conditions:** Since, we have not selected the **Summary query** so Step 5 and Step 6 of the wizard will be skipped.

The **Query Wizard** shows the option of the **Aliases** step.

Step 8: **Aliases:** In this step we give alias name i.e. the column header name will be displayed when we run the query. By default, the field names will be displayed as column headers. Many times, field names are not user friendly, so an alias name which is more readable, is chosen to be displayed in the query output. So, specify the user defined headings (Alias) to the fields as shown below:

Click on the **Next** button to move to the last step of the wizard.

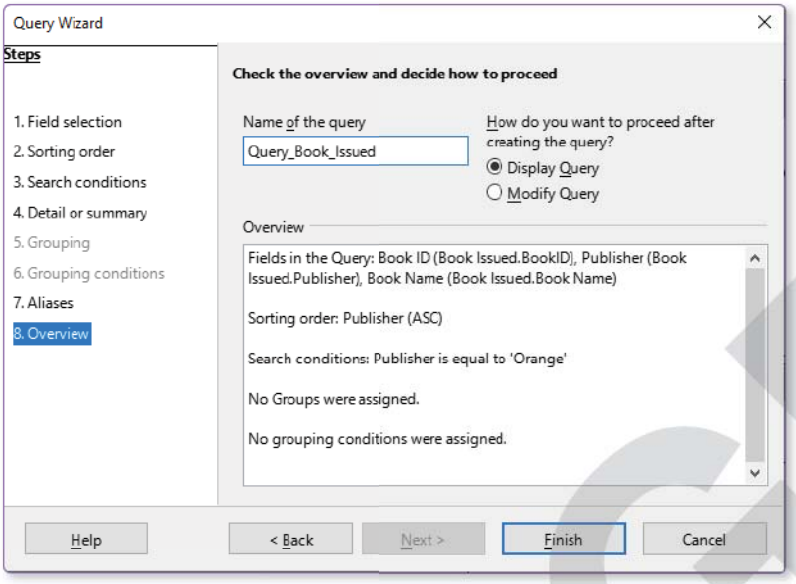


The **Query Wizard** shows the option of the **Overview** step. This step displays the overview of the query.

Step 9: **Overview:** Thus is the last step of the Query wizard and it displays the entire overview of the query that we have designed using wizard. It includes the following:

- **Name of the query**: By default, the name of the query is Query_Book_Issued. If you wish to change then type the new name in the text box.
- **How do you want to proceed after creating the query?**: By default, **Display Query** radio option will be selected. Click and select the Modify Query radio button if the query must be edited in the Design.
- **Complete detail of the query**: This section contains a summary about the query that has been created.

Click on the **Finish** button.



As soon as, you click on the finish button the Query Wizard close and you will see the output of the query displayed as shown below:

Once the query is created, it can be edited in Design view

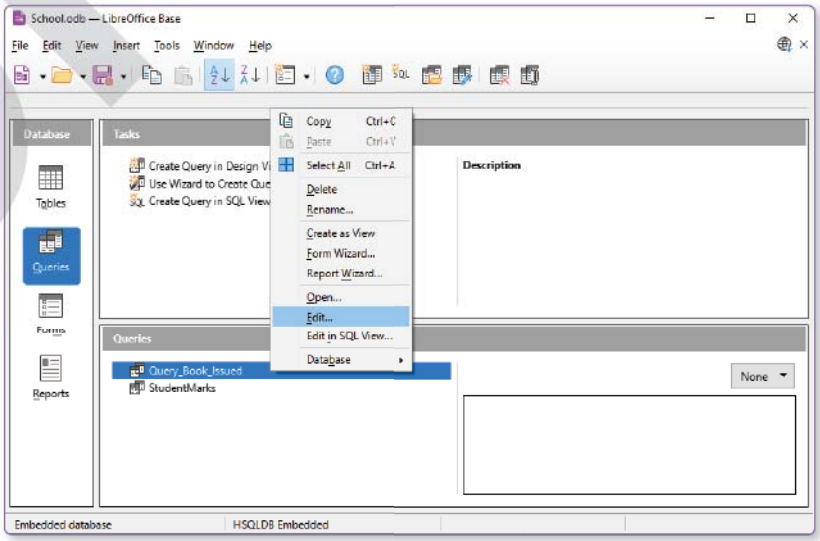
Editing a Query

Perform the following steps to edit a query:

Step 1: Open the database containing the query that you want to edit.

Step 2: Click on the **Queries** object from the **Database** pane.

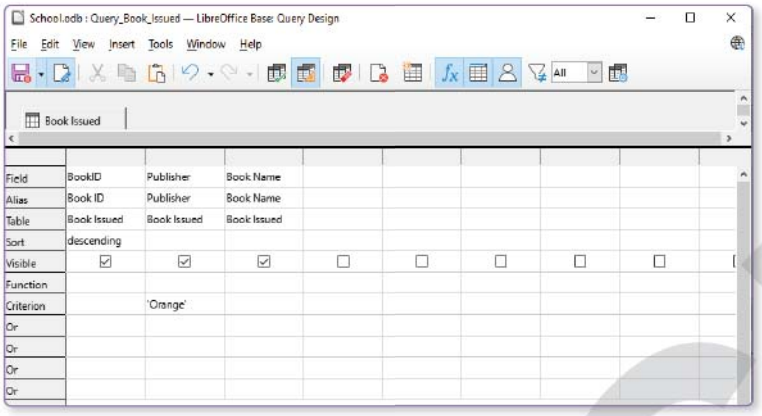
Step 3: Right-click on the query to be edited in the **Queries** pane and select the **Edit** option from the context menu.



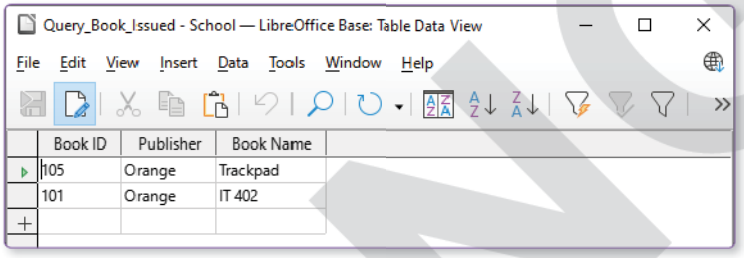
The query opens in a **Query Design window** where you can make the required changes.

Step 4: Modify the query according to your requirement

Step 5: Click on the **Save** button in the **Query Design** toolbar.



Now if you run the query, you will get the different output.



Setting Multiple Fields Criteria

Perform the following steps to use multiple field criteria:

Step 1: Create a query in design view.

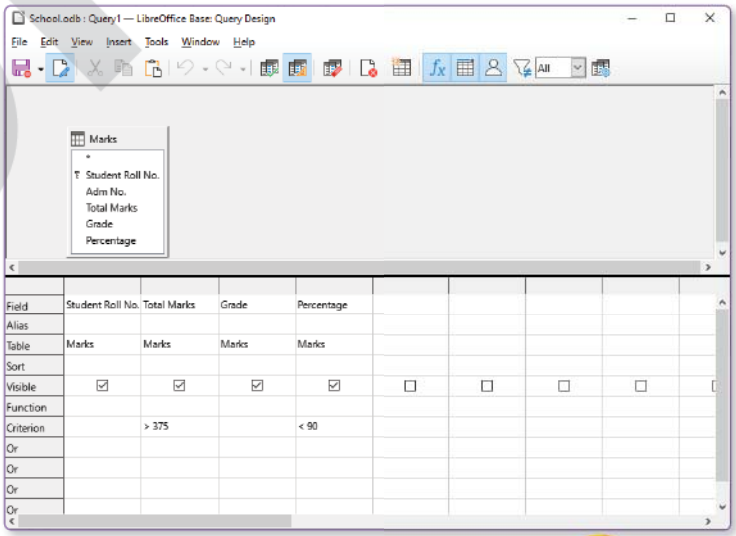
The **Query Design** window open with the **Add Table or Query** dialog box.

Step 2: Add the table you wish to use in the query as **Marks** table.

Step 3: Click the **Close** button in the **Add Table or Query** dialog box.

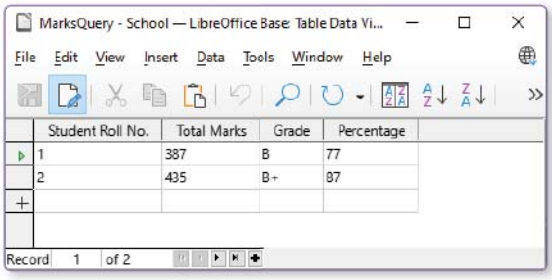
Step 4: Add fields for query.

Step 5: Set the criteria in different fields. In this case, we have set the criteria in two fields: Total Marks > 375 Percentage<90.



Step 6: Save the query with the specified name.

When you execute the preceding query, you will get the result as shown below:



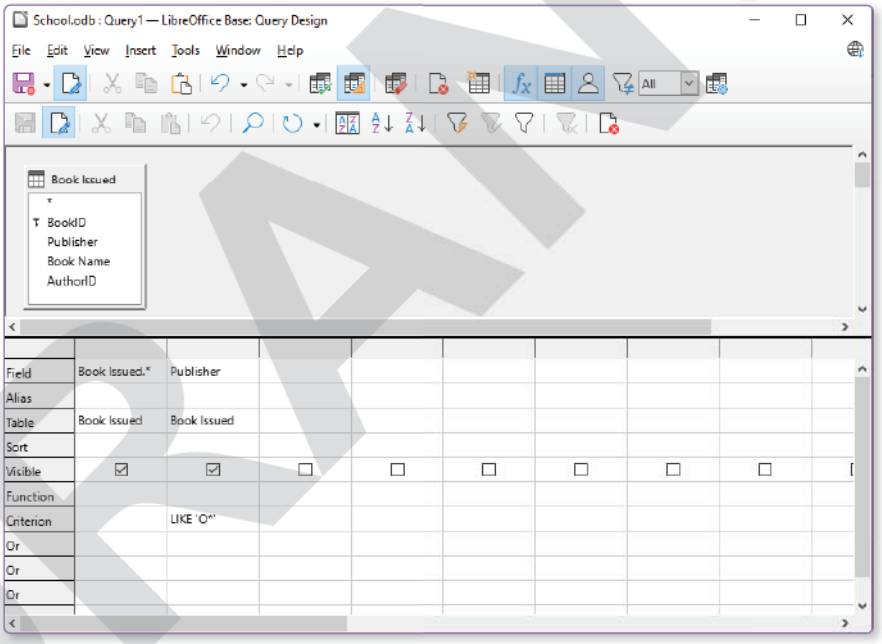
Using Wildcards

Wildcard characters are used to retrieve a set of records from a table that contains some specified character. Base provides two wildcard characters "*" and "?". The "*" wildcard represents one or more characters. On the other hands, the "?" wildcard represents only one character.

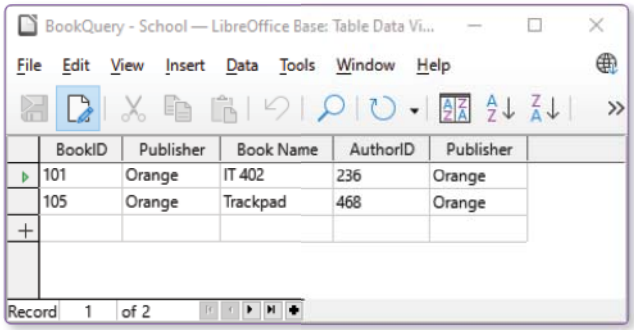
Perform the following steps to use the wildcard characters:

Step 1: Create a query in **Design** view based on the **STUDENTS** table.

Step 2: Use the "*" wildcard character to retrieve all the fields of the Book Issued table where Publisher name is starts with the letter 'O'.



When you run the preceding query, you will get the following output:



Performing Calculations in Queries

Many times, the user needs to perform calculations on the fields used in a table. LibreOffice Base allows the user to create a query for performing such calculations. Let us say, in the table Product, the user needs to calculate **Total Amount** as **Quantity * Price**.

To create a query for performing such calculations, follow these steps:

Step 1: Create a query in design view.

The **Query Design** window open with the **Add Table or Query** dialog box.

Step 2: Add the tables you wish to use in the query as **Product** tables.

Step 3: Click the **Close** button in the **Add Table or Query** dialog box.

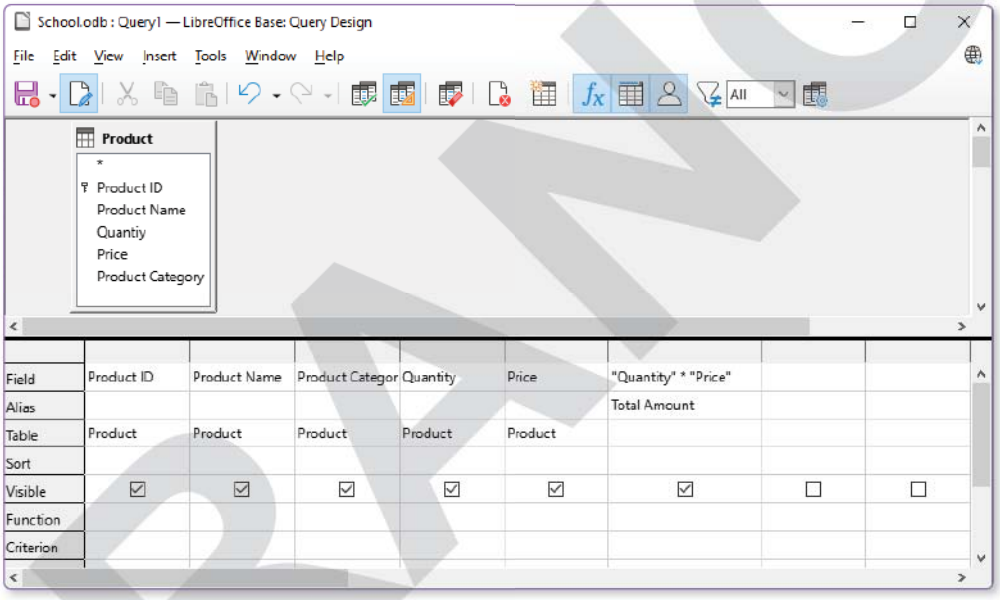
Step 4: Add fields for query.

Step 5: In the **Field** row in the **Query Design** pane, in a blank column, type **Quantity * Price**.

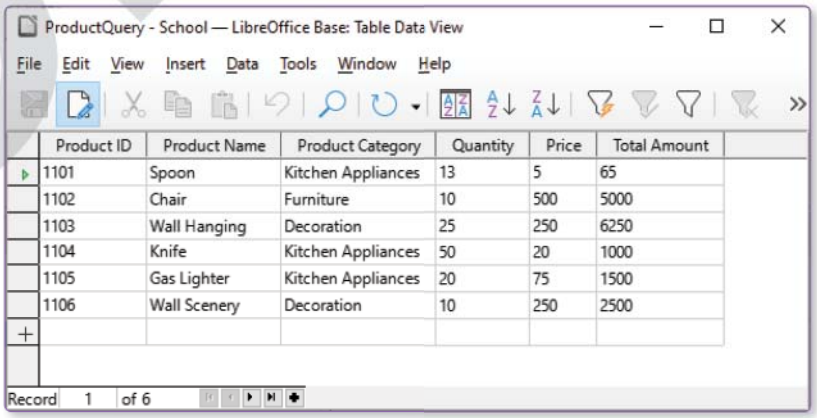
Step 6: Press the **Enter** key on the keyboard.

Step 7: Enter a name for the field in the **Alias** row as **Total Amount**.

Step 8: Save the query.



When you run the query, you will notice that a new column titled **Total Amount** is displayed showing the necessary calculations. Remember that calculation can be made only on those fields where data type used is **Numeric**.



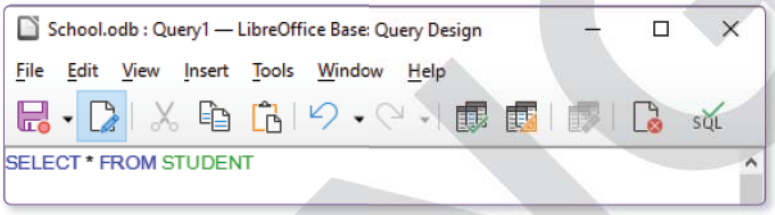
Product ID	Product Name	Product Category	Quantity	Price	Total Amount
1101	Spoon	Kitchen Appliances	13	5	65
1102	Chair	Furniture	10	500	5000
1103	Wall Hanging	Decoration	25	250	6250
1104	Knife	Kitchen Appliances	50	20	1000
1105	Gas Lighter	Kitchen Appliances	20	75	1500
1106	Wall Scenery	Decoration	10	250	2500

As you know that a relational database is a collection of tables. A user may insert new records/rows, delete records, and modify records in these tables. The language used to perform all these operations is known as query language. A Database Management System (DBMS) used to manage Relational Databases is called RDBMS (Relational Database Management System). Many RDBMS software, such as MySQL, Microsoft SQL Server, PostgreSQL, Oracle, etc., allow us to create a database consisting of relations and link one or more relations for efficient querying to store, retrieve, and manipulate data in that database.

Structured Query Language (SQL) is the standard language for managing relational databases and performing various operations on the data in the tables. It would enable us to store, retrieve, and manipulate data in the tables.

SQL is a high-level interactive language that allows users to specify what is required to be done in the form of queries. Unlike other high-level languages, we do not need to specify how the SQL operations are implemented.

LibreOffice Base provides SQL view to write queries. We can access it by clicking on the Create Query in SQL View command under the Tasks pane.



After writing the query, save the query. Close the query design window. Double-click on the query name under the Tasks pane. The result of the query will be displayed.

Adm No.	Name	Address	City	Phone No.	Date of Birth
101	AMITA	VASAN KUNJ	DELHI	1122336655	08/23/06
102	NEHA	LAJPAT NAGAR	DELHI	2211554477	02/24/07
103	YASH	YAMUNA VIHAR	DELHI	5588996655	03/25/03
104	VIHAN	SHASTRI NAGAR	DELHI	5623894535	03/05/06
105	RITESH	SANT NAGAR	DELHI	2569856415	06/05/03

Record 1 of 5

Types of SQL Commands

SQL commands are broadly classified into the given categories:

- Data Definition Language (DDL) commands
- Data Manipulation Language (DML) commands

Data Definition Language (DDL)

The SQL-DDL contains a set of commands that allows the users to make changes in the structure of the table like:

- Creating a new data definition using CREATE
- Adding, updating, removing the data definition using ALTER
- Deleting the data definition from the database using DROP

Syntax to create a new table in the database using SQL is as follows:

```
CREATE TABLE <Table Name>
(<Column Name1> <Data Type>,<Column Name2> <Data Type>,
... <Column Name n> <Data Type>);
```

Example:

```
CREATE TABLE student (RollNo Integer, Name VARCHAR(20), Fees integer, DOB Date,
Marks integer);
```

The syntax to display the structure of the table is as follows:

```
DESCRIBE <Table Name> OR Desc <Table Name>
```

For example,

```
DESC STUDENT;
OR
DESCRIBE STUDENT;
```

```
+--------+-------------+------+-----+---------+-------+
| Field  | Type        | Null | Key | Default | Extra |
+--------+-------------+------+-----+---------+-------+
| RollNo | int         | YES  |     | NULL    |       |
| Name   | varchar(20) | YES  |     | NULL    |       |
| Fees   | int         | YES  |     | NULL    |       |
| DOB    | date        | YES  |     | NULL    |       |
| Marks  | int         | YES  |     | NULL    |       |
+--------+-------------+------+-----+---------+-------+
```

The syntax to add a new column(s) in the table is as follows:

```
ALTER TABLE <Table Name>
ADD (<Column Name1> <Data Type>,<Column Name2> <Data Type>,
... <Column Name n> <Data Type>);
```

For examples,

```
ALTER TABLE student ADD (ClassSec VARCHAR(30));
```

The syntax to delete a table (data as well as the structure) is as follows:

```
DROP TABLE <Table Name>;
```

For example,

```
DROP TABLE Student;
```

DML (Data Manipulation Language)

DML is a language that enables users to access or manipulate data. By data manipulation, we mean:

- The retrieval of information stored in the table, using SELECT
- The insertion of new row with information into the table, using INSERT
- The deletion of information from the table (not deleting the column), using DELETE
- The modification of information stored in the table (not modifying the data type of column), using UPDATE

The syntax for inserting a new record in the table is as follows:

```
INSERT INTO <Table Name> [(<Col1>,<Col2>,... <Col N>)]
VALUES ((<Col1 Value>,<Col2 Value>,... <Col N Value>);
```

For example,

```
INSERT INTO student VALUES (14,'Jaya Kapoor',7800,'2008-03-08',78, 9);
INSERT INTO student VALUES (35,'Sikha Arora',8800,'2004-12-15',87, 5);
INSERT INTO student VALUES (8,'Aparna Aneja',9000,'2006-09-24',92, 6);
```


```
INSERT INTO Student VALUES (12,'Debrath Singh',8600,'2010-10-27',80,'10A');
```

The syntax for displaying the content from a table is as follows:

```
SELECT */<Col1>,<Col2>, ... <Col N>
FROM <Table Name>
WHERE <Condition>;
```

To display all rows and all columns from the table student:

```
SELECT * FROM Student;
```

RollNo	Name	Fees	DOB	Marks	ClassSec
14	Jaya Kapoor	7800	2008-03-08	78	9
35	Sikha Arora	8800	2004-12-15	87	5
8	Aparna Aneja	9000	2006-09-24	92	6
12	Debrath Singh	8600	2010-10-27	80	10A

To display only Rollno and Name with all rows from the table student:

```
SELECT ROLLNO,NAME FROM Student;
```

ROLLNO	NAME
14	Jaya Kapoor
35	Sikha Arora
8	Aparna Aneja
12	Debrath Singh

To display records of students whose fees is more than 8500.

```
SELECT * FROM Student WHERE FEES>8500;
```

RollNo	Name	Fees	DOB	Marks	ClassSec
35	Sikha Arora	8800	2004-12-15	87	5
8	Aparna Aneja	9000	2006-09-24	92	6
12	Debrath Singh	8600	2010-10-27	80	10A

To display rollno and names of students whose rollno is 14 and fees is more than 5000.

```
SELECT ROLLNO,NAME
FROM STUDENT
WHERE ROLLNO=14 AND FEES>5000;
```

ROLLNO	NAME
14	Jaya Kapoor

To display the Rollno, name and DOB of students whose marks are in the range of 80 and 90.

```
SELECT ROLLNO,NAME,DOB FROM student WHERE MARKS>=80 AND MARKS<=90;
OR
SELECT ROLLNO,NAME,DOB FROM student WHERE MARKS BETWEEN 80 AND 90;
+--------+---------------+------------+
| ROLLNO | NAME          | DOB        |
+--------+---------------+------------+
|     35 | Sikha Arora   | 2004-12-15 |
|     12 | Debrath Singh | 2010-10-27 |
+--------+---------------+------------+
```

The syntax for modifying the existing content of the table is as follows:

```
UPDATE <Table Name>
SET <Col1>=<Value1> [,<Col2>=<Value2>,... <Col N>=<Value N>]
[WHERE <Condition>];
```

For examples,

```
UPDATE STUDENT SET MARKS=92 WHERE CLASSSEC='10A' ;
UPDATE STUDENT SET CLASSSEC='11C' WHERE NAME='JAYA KAPOOR';
UPDATE STUDENT SET CLASSSEC='9D' WHERE ROLLNO=35;
UPDATE STUDENT SET CLASSSEC='10A' WHERE FEES=9000;
SELECT * FROM STUDENT;
+--------+---------------+------+------------+-------+----------+
| RollNo | Name          | Fees | DOB        | Marks | ClassSec |
+--------+---------------+------+------------+-------+----------+
|     14 | Jaya Kapoor   | 7800 | 2008-03-08 |    78 | 11C      |
|     35 | Sikha Arora   | 8800 | 2004-12-15 |    87 | 9D       |
|      8 | Aparna Aneja  | 9000 | 2006-09-24 |    92 | 10A      |
|     12 | Debrath Singh | 8600 | 2010-10-27 |    92 | 10A      |
+--------+---------------+------+------------+-------+----------+
```

To display Name and fees of the student with increased fees by Rs 250.

```
SELECT NAME, FEES+250 FROM STUDENT;
+---------------+----------+
| NAME          | FEES+250 |
+---------------+----------+
| Jaya Kapoor   |     8050 |
| Sikha Arora   |     9050 |
| Aparna Aneja  |     9250 |
| Debrath Singh |     8850 |
+---------------+----------+
```

Using like operator

Like operator is used with WHERE clause to search for a specific pattern in a column.

It can be used with two wildcard characters:

- The percent sign (%) represents zero, one, or more characters

- The underscore sign (_) represents one character

To display rollno, name and fees of those students whose names end with 'a'.

```
SELECT ROLLNO,NAME,FEES  FROM STUDENT WHERE NAME LIKE '%a';
+--------+-------------+------+
| ROLLNO | NAME        | FEES |
+--------+-------------+------+
|     35 | Sikha Arora | 8800 |
|      8 | Aparna Aneja | 9000 |
+--------+-------------+------+
```

To display records of those students whose names start with 'A'.

```
SELECT * FROM STUDENT WHERE NAME LIKE "A%";
+--------+-------------+------+-----------+-------+----------+
| RollNo | Name        | Fees | DOB       | Marks | ClassSec |
+--------+-------------+------+-----------+-------+----------+
|      8 | Aparna Aneja | 9000 | 2006-09-24 |    92 | 10A      |
+--------+-------------+------+-----------+-------+----------+
```

To display Name and class of those students whose second alphabet is 'a'.

```
SELECT NAME,CLASSSEC FROM STUDENT WHERE NAME LIKE  '_A%';
+-------------+----------+
| NAME        | CLASSSEC |
+-------------+----------+
| Jaya Kapoor | 11C      |
+-------------+----------+
```

Displaying arranged data

Arranging the data in ascending or descending order of one/multiple columns. Use ASC(Default) for ascending, DESC for descending (use of ORDER BY clause with SELECT)

Syntax:

```
SELECT */<Col1>,<Col2>, ... <Col N>
FROM <Table Name> ORDER BY <Col1> [ASC/DESC],<Col2> [ASC/DESC],... ;
```

```
SELECT * FROM STUDENT ORDER BY Name ASC;
+--------+--------------+------+-----------+-------+----------+
| RollNo | Name         | Fees | DOB       | Marks | ClassSec |
+--------+--------------+------+-----------+-------+----------+
|      8 | Aparna Aneja | 9000 | 2006-09-24 |    92 | 10A      |
|     35 | Sikha Arora  | 8800 | 2004-12-15 |    87 | 9D       |
|     12 | Debrath Singh | 8600 | 2010-10-27 |    92 | 10A      |
|     14 | Jaya Kapoor  | 7800 | 2008-03-08 |    78 | 11C      |
+--------+--------------+------+-----------+-------+----------+
```

```
SELECT * FROM Student ORDER BY Fees DESC;
+--------+---------------+------+------------+-------+----------+
| RollNo | Name          | Fees | DOB        | Marks | ClassSec |
+--------+---------------+------+------------+-------+----------+
|      8 | Aparna Aneja  | 9000 | 2006-09-24 |    92 | 10A      |
|     35 | Sikha Arora   | 8800 | 2004-12-15 |    87 | 9D       |
|     12 | Debrath Singh | 8600 | 2010-10-27 |    92 | 10A      |
|     14 | Jaya Kapoor   | 7800 | 2008-03-08 |    78 | 11C      |
+--------+---------------+------+------------+-------+----------+
```

The syntax for deleting a row/rows from a table is as follows:

```
DELETE FROM <Table Name> [WHERE <Condition> ];
```

For example,

```
DELETE FROM Student WHERE RollNo=12
```

To delete all rows of a table (Does not delete the structure of the table)

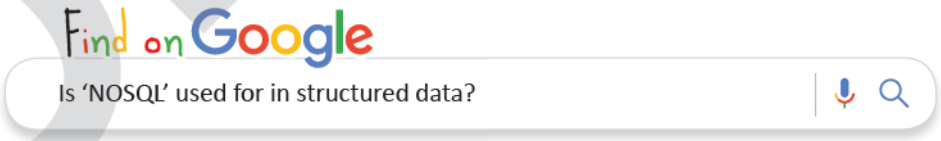
```
DELETE FROM Student;
```

Consider the following table "ITEM":

ITEMNO	NAME	PRICE	QUANTITY
11	SOAP	34	12
22	POWDER	85	10
33	FACE CREAM	80	15
44	SHAMPOO	120	21
55	CONDITIONER	200	11

Write SQL queries to do the following:

- Display the total amount of each item. The amount must be calculated as the price. multiplied by quantity for each item.
- Display the details of items whose price is less than 50.
- Display the name of items and its price in ascending order.
- Display the details of all items whose name start with 'S'.



WHAT IS A FORM?

In a table the datasheet view is used to enter data. The row and column format of the data-sheet view is not a user-friendly interface. The user may accidentally or intentionally alter the data in the table. Therefore, LibreOffice Base provides the **Form** feature for data entry purposes.

Form is a database object which is used to create an interactive user interface by connecting it with a table. Each field of a table is displayed in a text box with a Field label on one side so that the user can enter, edit and view records in an efficient way. The data added, deleted, updated through a form will be reflected in the table connected to the form.

For any database, it is the front end for data entry and data modification. It displays the data in a layout design by the user and not just in a simple row and column format as seen in a table.

In a form layout the **field controls** are arranged in a presentable and user-friendly manner. Each field control consists of:

- **Label**: A label is a piece of text that represents the field on the form.
- **Field value** text box: A field value text box is linked to the respective field in the table.

We may add all or selected fields from the table on the form. In addition to field controls, it may contain some additional text like titles, headings and names, graphics like logos, list boxes and radio buttons.

A form in Open Office Base can be created by using any of the given methods:

- Use Wizard to Create Form
- Create Form in Design View

Creating Form Using Wizard

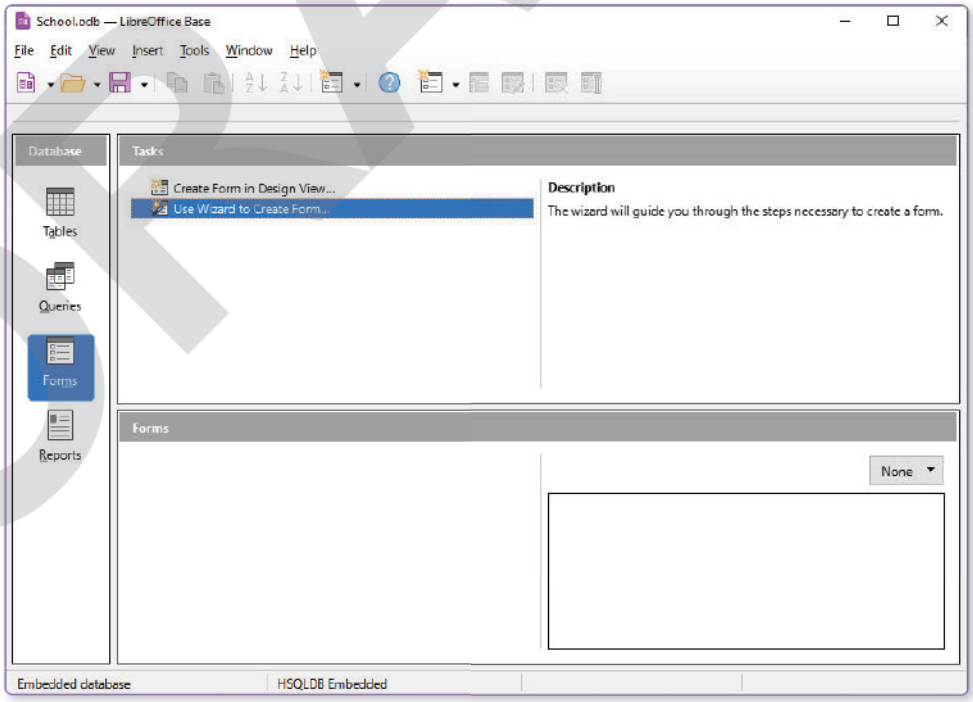
Creating a form using a wizard involves guiding the user through a step-by-step process to collect information or complete a task. Each step typically focuses on gathering specific information that helps in making the form more manageable.

Follow the given steps to create a form using a wizard:

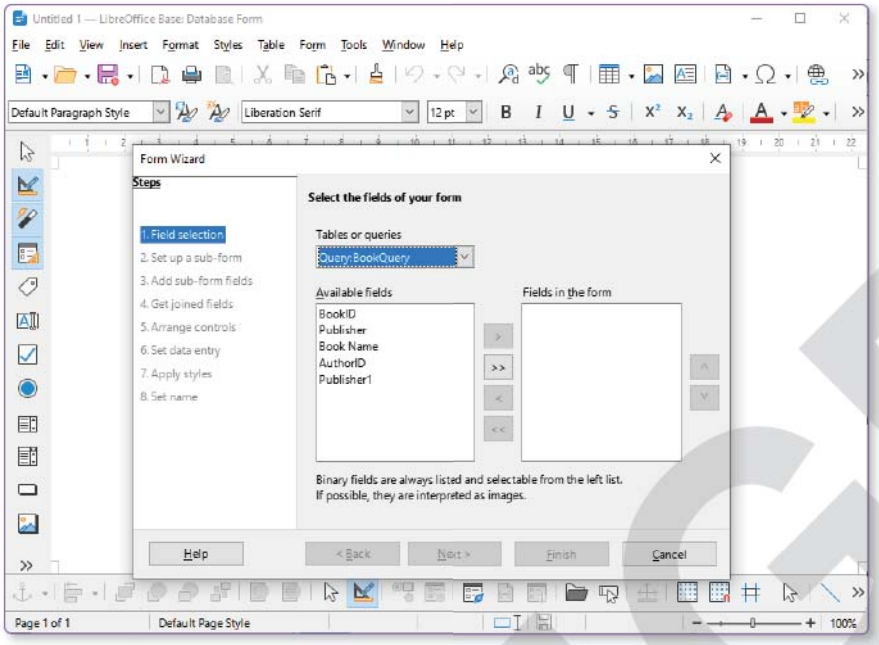
Step 1: Open the **School.odb** database.

Step 2: Select **Forms** option in the **Database** pane.

Step 3: Click on the **Use Wizard to Create Form** option from the **Tasks** pane.



The Form Wizard's eight steps will be displayed as shown below:



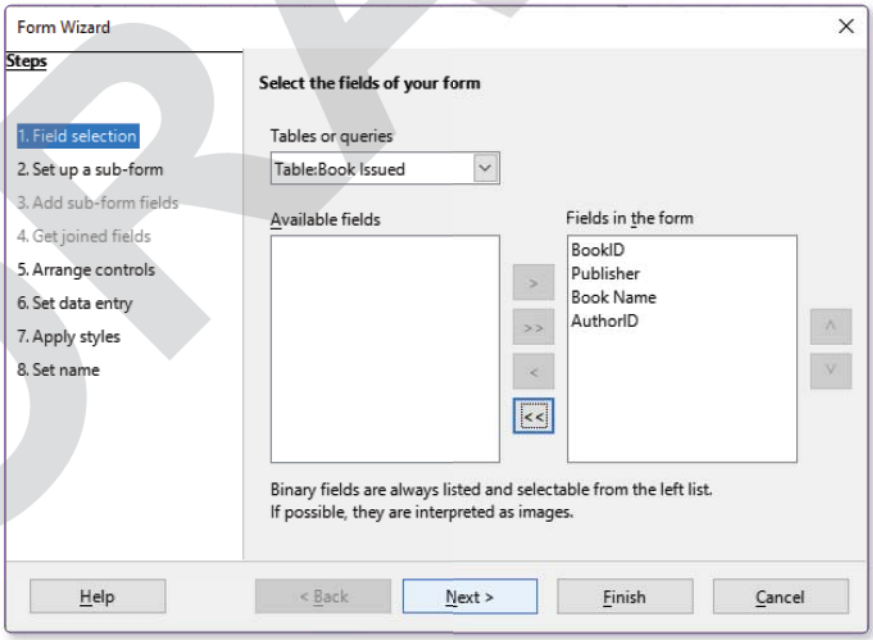
Step 4: **Field Selection:** Select the **Table or queries** for which the form is to be created. In this case, we have selected the **Book Issued** table.

The field of the selected table displays in the **Available fields** list box.

Select the **BookID** option from the **Available fields** list box and click on the > button to move the selected field to the **Fields in the form** list box.

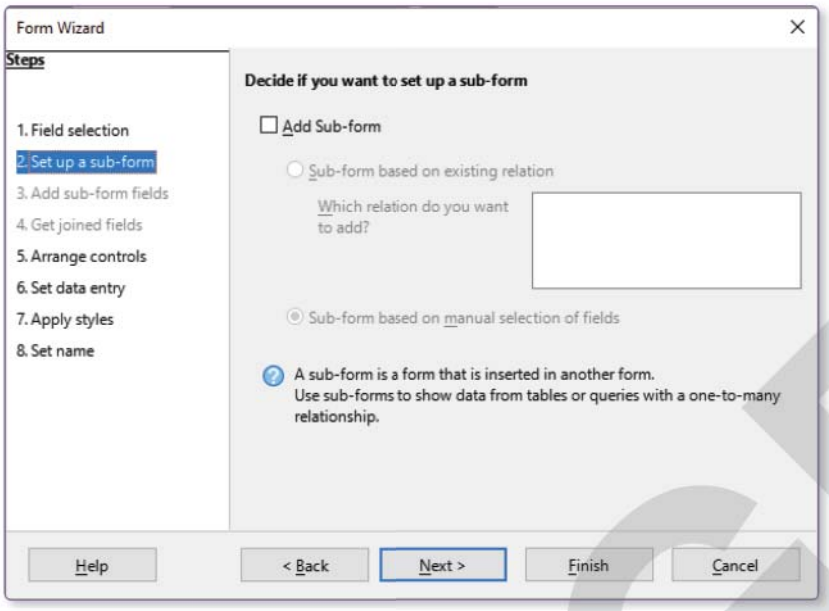
Similarly, move the **Publisher**, **Book Name**, and **Author ID** fields from the **Available fields** list box to **Fields in the form** list box.

Click on the **Next** button to move to the next step of the wizard.



Step 5: **Set up a sub-form:** This step helps you insert a form within another form. Since we are not doing this as an example, we ignore this step.

Click on the **Next** button to move to the next step.



Third and Fourth steps of the Form Wizard will be skipped if we are not creating a sub-form.

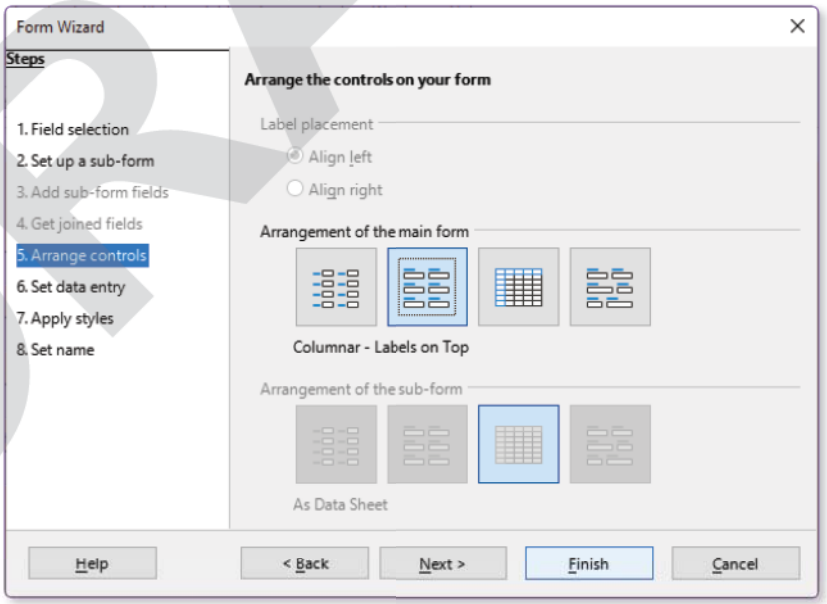
Step 6: **Arrange controls:** This step helps you to arrange the label and field value text boxes i.e. this step will set up the design of the form.

Four layouts are given in this step of the wizard to choose from:

- Columnar display with Labels on the left of the field
- Columnar display with Labels on top of the field value
- Display as datasheet
- Block display with labels on top.

Select the desired layout. In this case, we have selected the **Columnar-Labels on Top** layout.

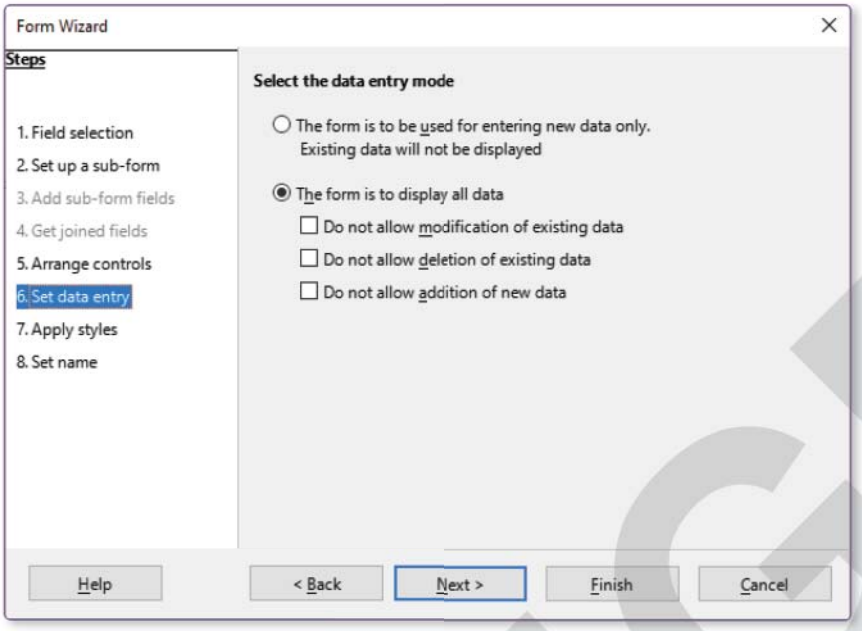
Click on the **Next** button to move to the next step.



Step 7: **Set data entry:** This step helps you choose a form for data entry or to display the values from the table or both options.

Select the desired radio button to specify the data entry mode for the form. In this case, we have selected **The form is to display all data** radio button.

Click on the **Next** button to move to the next step.

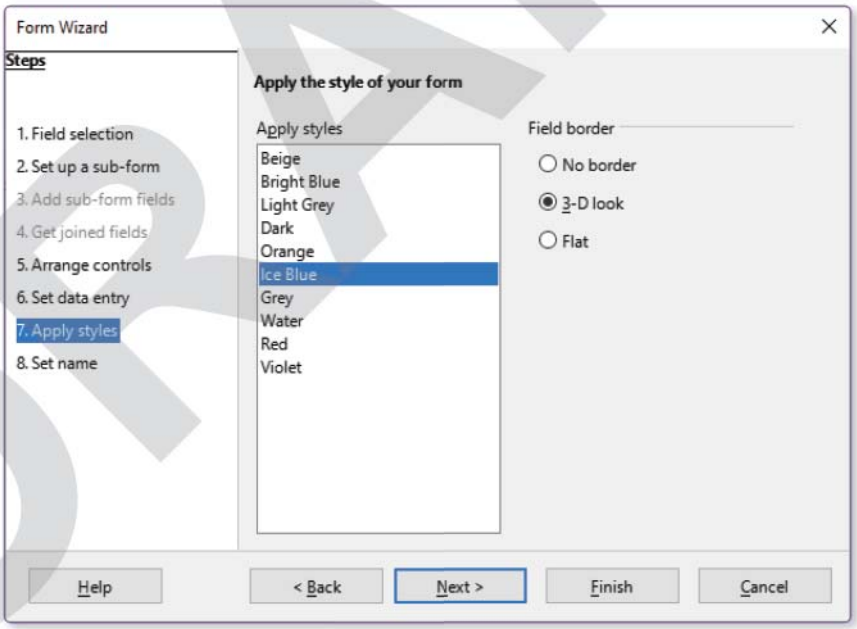


Step 8: **Apply Styles:** Select the desired style in the **Apply Style** list box that you want to apply to the form. In this case, we have selected the **Ice Blue** style.

Select the desired radio button in the **Field border** section to specify the border of the field. By default, the border of the field text value is displayed in **3-D look**. We can select the options No Border or Flat if required.

In this case, we have selected the **3-D look** radio button.

Click on the **Next** button to move to the next step.



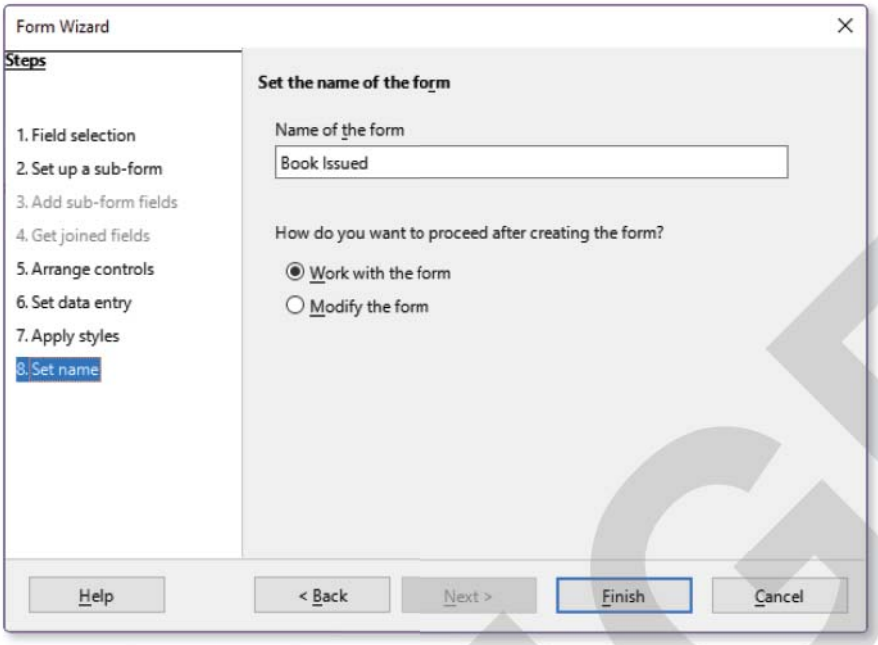
Step 9: **Set name:** This is the last step of **Form Wizard.** In this step we set the name of the form. By default the name of the form is same as the name of the table.

Enter the name of the form in the **Name of the form** text box. In this case, we have entered **Book Issued**.

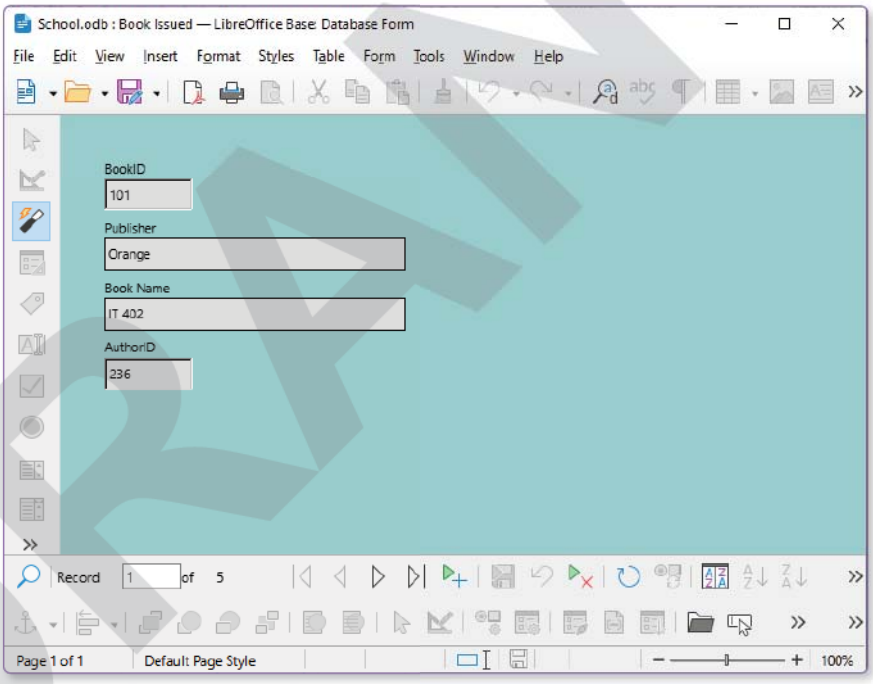
Select the desired radio button to specify how to proceed the form after creating it. In this case, we have selected the **Work with the form** radio button.

If you wish to modify the form after the wizard finishes, select the **Modify the form** radio button.

Step 10: Click on the **Finish** button to create a form.



The form with the first record will be displayed on the screen in a separate window.



You can see the **Forms Control** toolbar on the left of the **Form Design window** and the **Form Navigation** toolbar at the bottom.

The **Forms Control** toolbar contains various controls that can be added to the form.

The **Form Navigation** toolbar contains the navigation control buttons. With the help of these buttons, we can traverse and view the records in the file. As we move from one record to another, the record number in the record text boxes change.

Following table shows the different tools available on the toolbar and their description:

Tools	Description
Find Record	Allows you to search a specific record in the table
Record Record 1 of 5	Displays the current record number that displays on the form
First Record	Displays the first record on the form
Previous Record	Displays the previous record
Next Record	Displays the next record
Last Record	Displays the last record on the form
New Record	Adds the new record
Save Record	Save the new record in the table
Undo: Data entry	Undo the last data entry that you made
Delete Record	Delete the record that is displayed on the form
Refresh	Reloads the data in the form from the underlying database
Refresh Control	Refresh a specific form control
Sort	Sort the data in ascending or descending order
Sort Ascending	Sort the data in ascending order
Sord Descending	Sort the data in descending order
AutoFilter	Automatically filter records based on the content of the current field
Apply Filter	Apply a previously defined filter to your data
Form-Based Filter	Create a filter based on the form's data
Reset Filter/Sort	Clears any applied filters or sorting and return to the default view
Data source as Table	Display the form's underlying data source in a tabular format

Creating Form in Design View

When we create a form in Design View, all the controls are placed on the form using various tools given in the Forms Control toolbar.

Following are steps to create form in design view:

Step 1: Open the **School.odb** database.

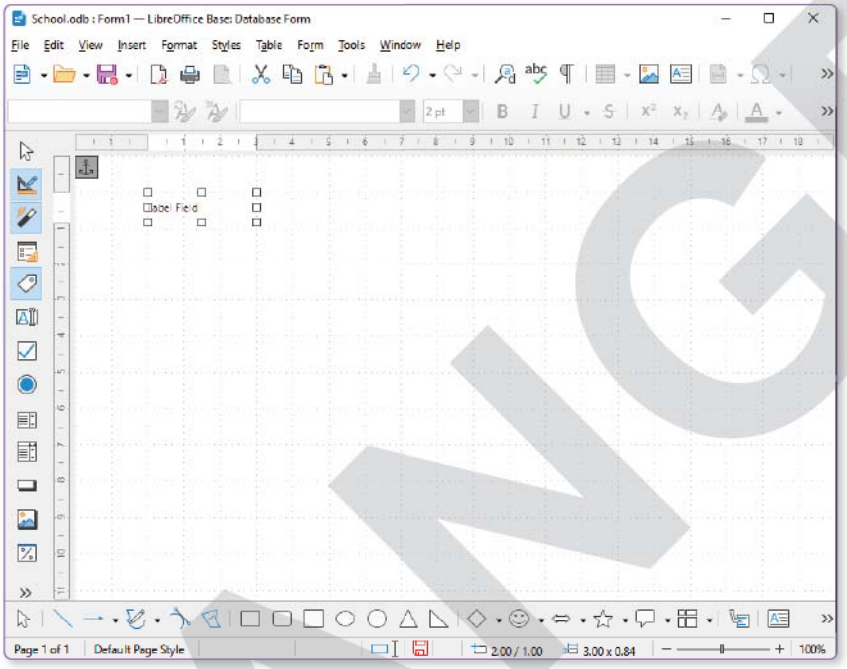
Step 2: Select **Forms** option in the **Database** pane.

Step 3: Click on the **Create Form in Design View** option from the **Tasks** pane.

The **Form Design** window opens.

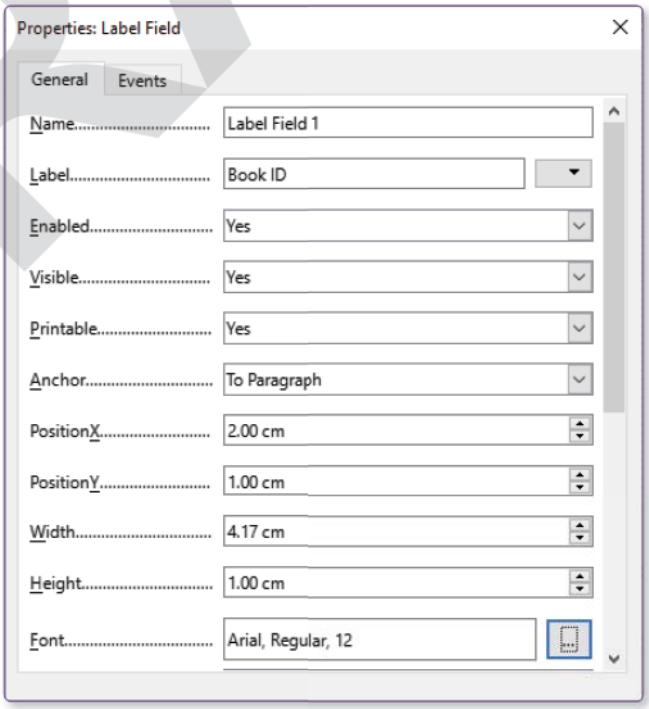
Step 4: Click on the **Label** button from the **Form Design** toolbar.

Step 5: Draw a **Label** box on the **Form Design** window by dragging the mouse.



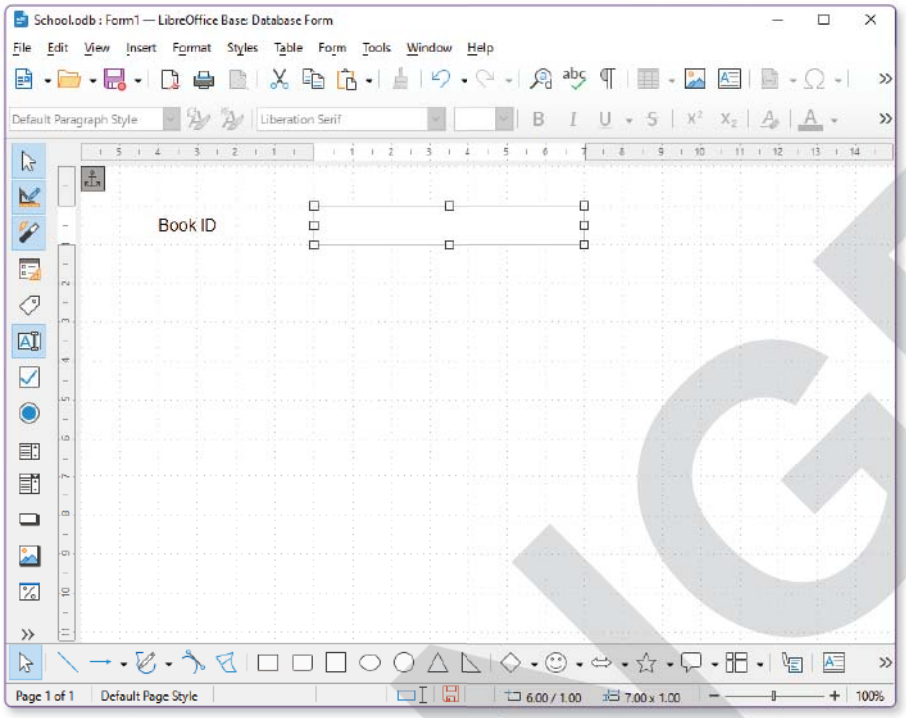
Step 6: Double-click on the **Label** box to open the **Properties: Label Field** dialog box. Here, the user can define the Label Properties like Label name, Font, Alignment, Size, etc.

Step 7: Specify the desired name to the label in the **Label** text box as well as to change the font type and size.



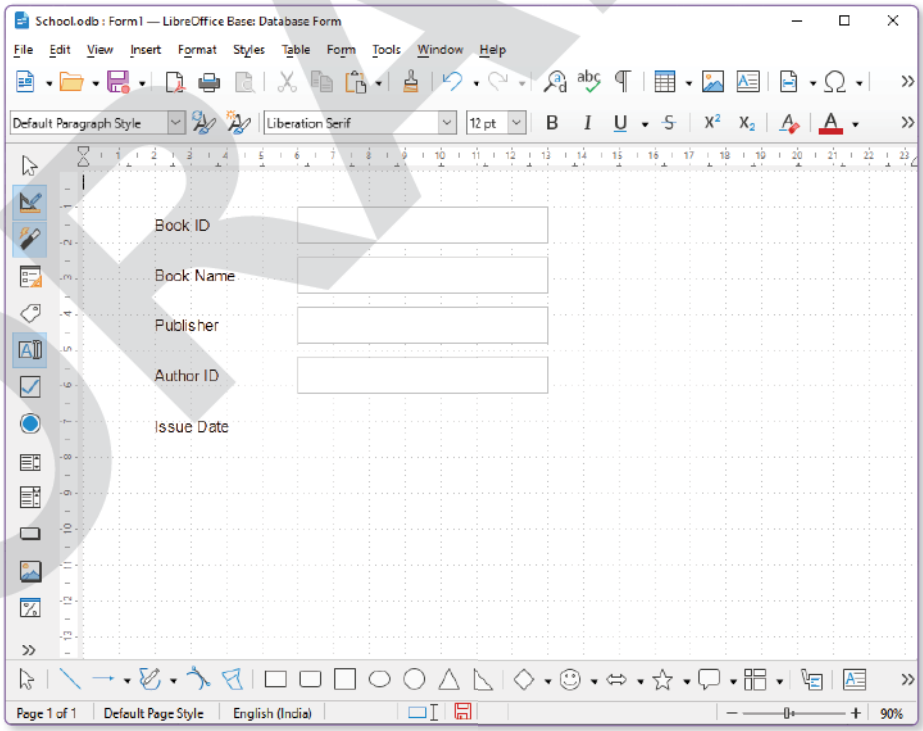
Step 8: Click on the **Text Box** button from the **Form Design** toolbar and draw a text box on the **Form Design** window by dragging the mouse.

The Text box is added in the form.



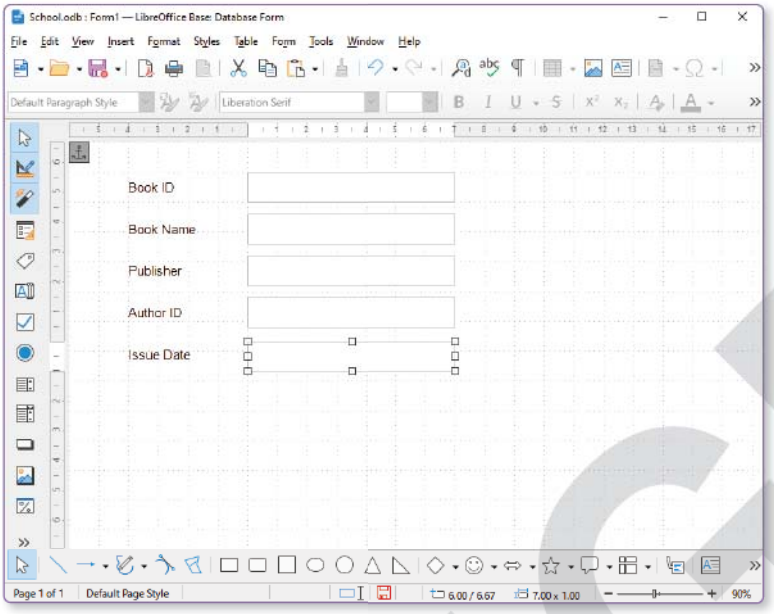
Step 9: Double-click on the text box to open the **Properties: Text Box** dialog box. Here, the user can define the text box properties like: Max. text length, Tab order, Default Text, Fonts, etc.

Similarly, you can add more labels and text boxes in the form.



Step 10: Click on the **Date Field** button from the **Form Design** toolbar and draw a date field on the **Form Design** window by dragging the mouse.

The date field is added in the form.



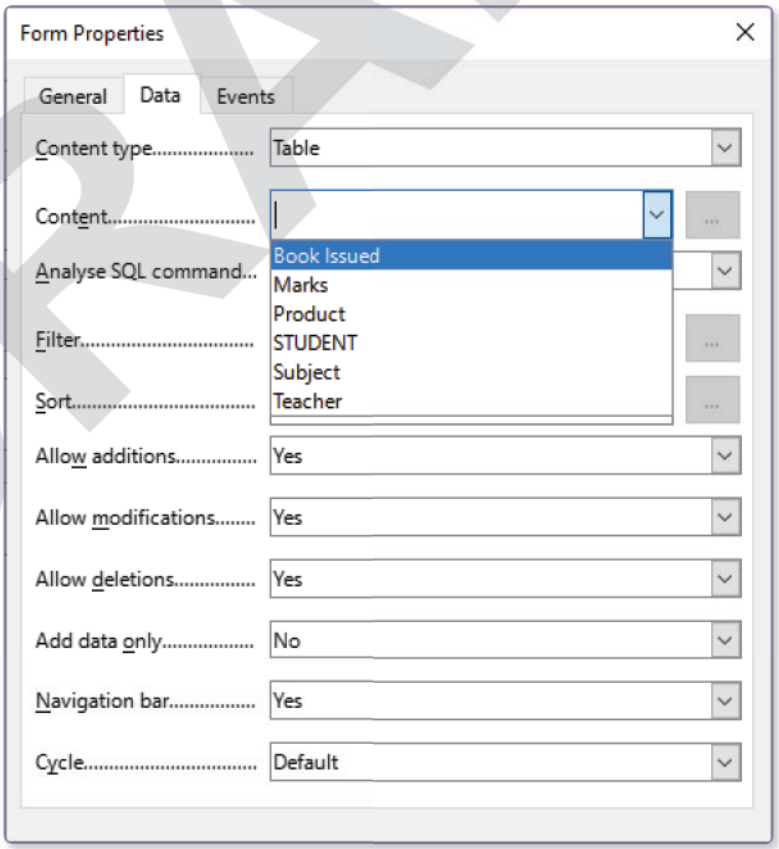
After creating a form, you need to link the form with the database objects, such as tables and query.

Step 11: Select the **Form** → **Form Properties** option from the menu bar. The **Form Properties** dialog box opens.

Step 12: Click on the **Data** tab in the **Form Properties** dialog box.

Step 13: Select the desired option in the **Content type** drop-down list to specify the type of database object you want to link to the form. Here, we have selected the **Table**.

Step 14: Select the desired table in the **Content** drop-down list to specify the table you want to link to the form. Here, we have selected the **Book Issued**.



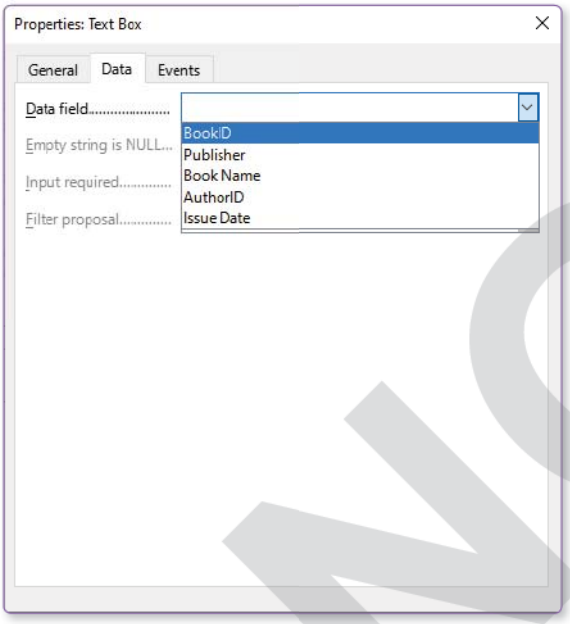
Step 15: Click the **Close** button in the **Form Properties** dialog box.

The Book Issued table is linked with the form. Now, you need to link the field with the table.

Step 16: Double-click on the text box beside the **Book ID** label. The **Properties: Text Box** dialog box opens.

Step 17: Click on the **Data** tab in the dialog box.

Step 18: Select the desired field in the **Data field** drop-down list to specify the filed that you want to link to the text box field. Here, we have selected the **BooKID**.



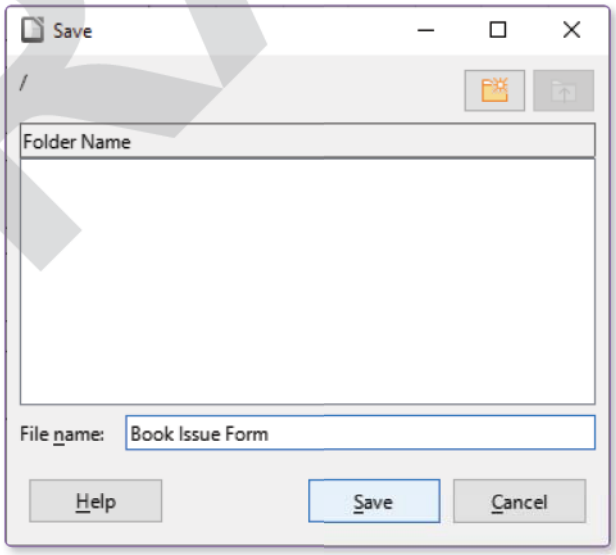
Step 19: Click the **Close** button in the **Properties: Text Box** dialog box.

Similarly, you can link the other text boxes and Date Field with the associate fields in the table.

Step 20: Click on the **Save** icon in the standard toolbar to save the form.

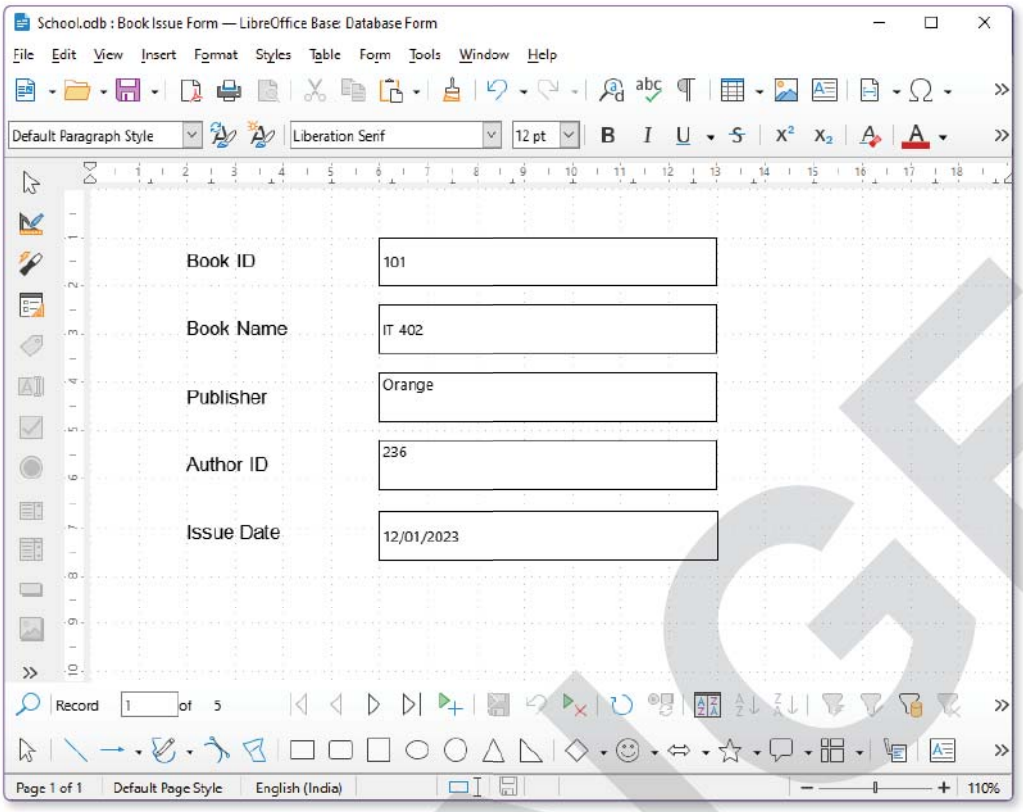
Step 21: Enter the name of the form in the **File name** text box.

Step 22: Click on the **Save** button.



The form is saved with the specified name.

When you see the form in the design view, it displays the records.



To toggle between Design view and Form view, you need to click the Design Mode button on the Forms Controls toolbar.

Modifying a Form

It is possible to modify a form in any manner once it is created in LibreOffice Base. This flexibility allows users to customise the form to meet their specific requirements and improve user experience. Some of the common modifications include changing the background colour, adjusting the font size and colour of the text, and repositioning various controls in the form. These changes not only enhance the visual appeal of the form but also contribute to better data organisation and easier navigation.

Changing the Background Colour

The steps to change the background colour of the form are as follows:

Step 1: Select **Forms** option in the **Database** pane.

The name of the saved form will be displayed in the **Forms pane**.

Step 2: Right-click on the form to be edited in the **Forms** pane and select the **Edit** option from the context menu.

The form opens in a **Form Design View** where you can make the required changes.

Step 3: Right-click on the form and select the **Page Style** option from the context menu.

The **Page Style** dialog box opens.

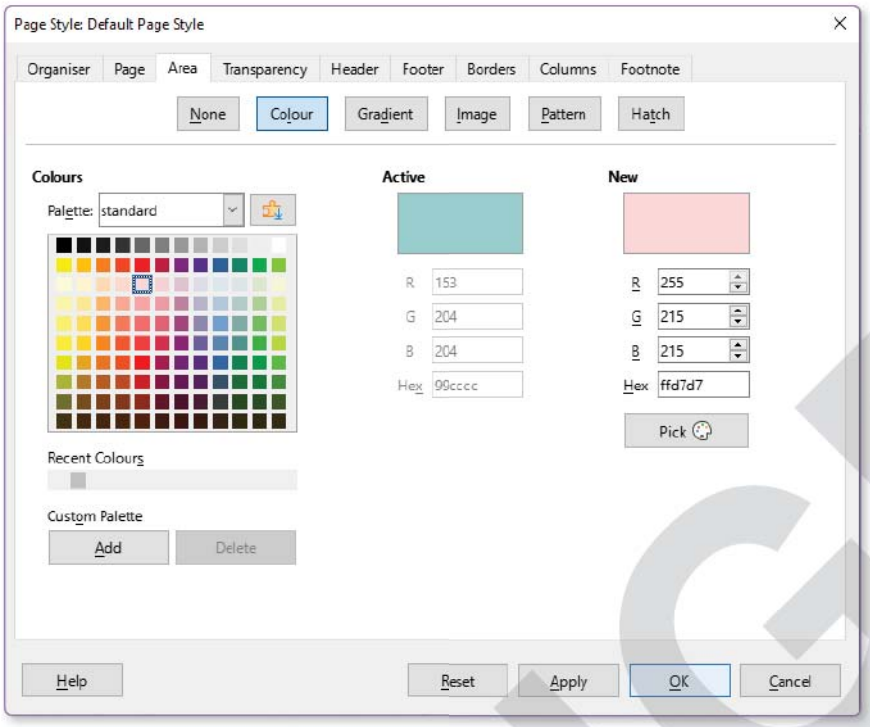
Step 4: Click on the **Area** tab in the dialog box.

Step 5: Click on the **Colour** button. The options related to the background colour is displayed.

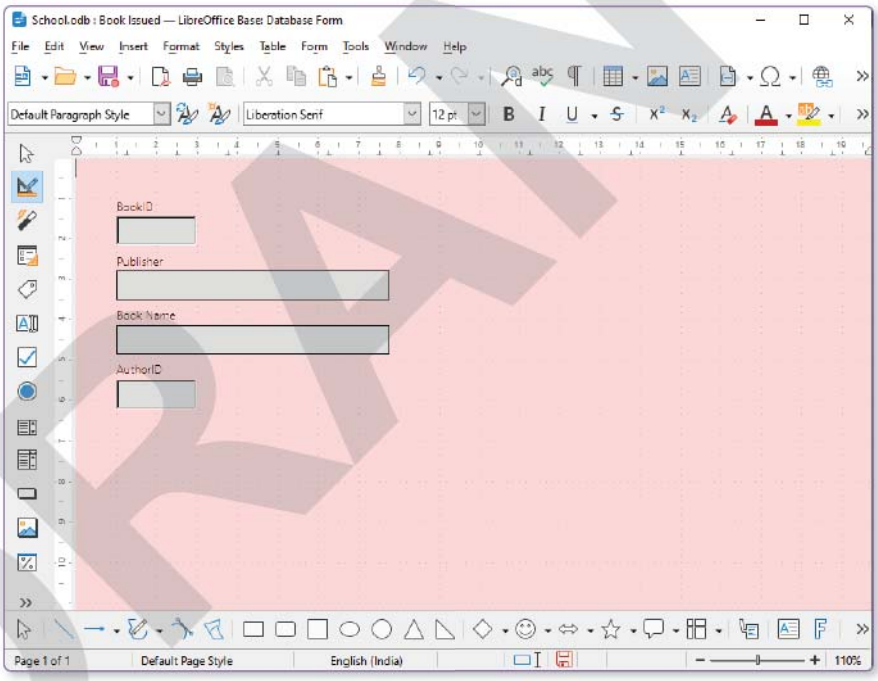
Step 6: Select the desired colour from the **Colour** palette.

The selected colour will appear in the **New** section with their RGB value.

Step 7: Click on the **OK** button.



The selected colour is applied on the form.



Editing the labels

To edit the labels, either by changing the text or by changing the formatting effects, follow the following steps:

Step 1: Place the mouse pointer on the label you wish to change. For example, AuthorID.

Step 2: Press **Ctrl + Click** to select the label. The position boxes will appear around the label.

Step 3: Right click on the selected label and select **Control Properties** option from the pop-up menu.

Step 4: The **Properties: Label Field** dialog box will appear. It contains various properties of the selected label. In the text box after **Label** property, type AuthorID. The label caption on the form changes accordingly.

Similarly we can change other properties of the selected label like width, height, alignment, font style and font size. After making the desired changes close the Properties dialog box by clicking the cross (x) button on the top right of the dialog box. The changes made will be applied on the selected text.

Moving a Control

In LibreOffice Base, we can easily move the controls designed on the form. We can move text boxes, labels, and other form elements to desired locations to match the form's design requirements.

The steps to move controls in the form are as follows:

Step 1: Click on the control that has to be moved.

The position handlers will be placed around the control.

Step 2: Click and drag the control to move it to the desired location.

The position of the control will be changed.

You can also change the position of the control by opening its corresponding **Properties** dialog box and then specify the value in the **PositionX** and/or **PositionY** option.

Changing the Size of Text Box Control

The steps to change the size of the text box control are as follows:

Step 1: Click on the **Text Box** control whose size you want to change.

The position handlers will be placed around the Text Box control.

Step 2: Click and drag any handle to change its size.

You can also change the size of the Text Box control by opening its corresponding **Properties** dialog box and then specify the value in the **Width** and/or **Height** option.

Adding a Tooltip

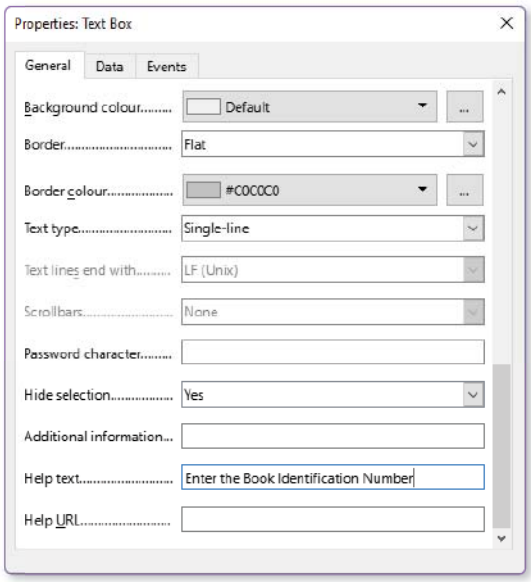
Tooltips are a great way to provide additional information about the Form controls. This information will be displayed when you place the mouse pointer over the Form control . It is also called the **help text.** For example, if the mouse pointer is placed over **Book ID** text-box, a message **Enter the Book Identification Number** can be displayed. Tooltip help users to understand the purpose of a Form control correctly.

Following are the steps to add a tooltip to text box:

Step 1: Double-click on the **Text Box** control to which you want to add a tooltip.

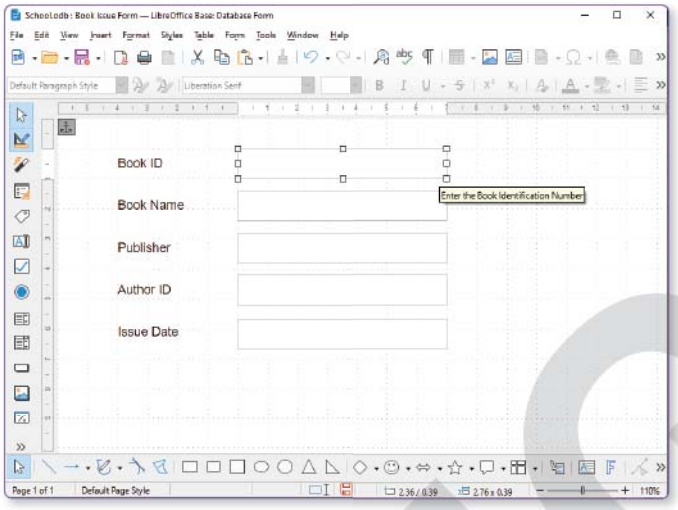
The **Properties: Text Box** dialog box opens.

Step 2: Types the message that you want to show as tooltip in the **Help text** text box. Here, we have entered **Enter the Book Identification Number**.



Step 3: Click the **Close** button to close the **Properties: Text Box** dialog box.

The tooltip is added to the selected text box. When you move the mouse pointer over the text box, the tooltip appears.



Forms Controls Toolbar

The forms control toolbar contains various tools to add or edit controls on the form. Let us learn to use few of these tools.

Adding a calendar for the date field

While filling up a form on a computer, mostly a calendar is displayed. This is because it is easy to choose a date rather than typing it. To add the calendar to the date field in the form, follow the steps given below:

Step 1: Place the mouse pointer over the Date text box and press **Ctrl + Click** to select it.

Step 2: Right click and select **Control Properties** option.

Step 3: In the **Properties: Date Field** dialog box, scroll down for **Date Format** property. By default, Standard (short) format will be displayed.

Step 4: Click to open the list box and select Standard (long) format.

Step 5: Scroll down further till you find the **DropDown** property. By default, its value is No. Select Yes.

Step 6: Close the dialog box. The selected date control text box on the form changes to a list box with an arrow being displayed in the extreme right.

Adding text to the form

While designing a form, we may need to enter titles, headings or subheadings known as **Labels**. Follow the following steps to insert the title text in the form.

Step 1: Click the **Label** tool on the Form Controls tool box.

Step 2: On the form, click and drag the mouse to create a label field box. It will also have position handlers.

Step 3: Double click on box to open the **Properties: Label Field**.

Step 4: Type the title as "Data Entry Form" in the **Label** property.

Step 5: Set the **Font** property by clicking the **Font button** in front of the Font property. The **Character dialog box** where you can set the font type, style and size. Choose the desired font style and size and click on **OK** button.

Step 6: Close the **Properties: Label Field** dialog box. The title with the selected formatting effects will be displayed on the form.

Entering a New Record

After you have finished designing the form, you can enter, delete, search a record using a form.

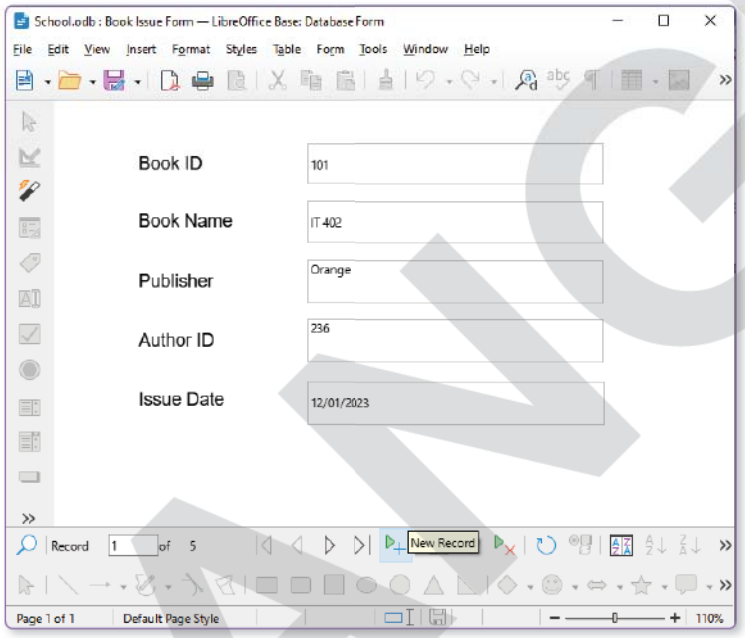
For this purpose, you have to shift from **Design View** to **Form View** by clicking on **Design Mode** button on the **Forms Controls toolbar**.

When you enter a record using form, the record will be saved in the linked table. Similarly, when you delete a record using form, the record will be deleted from the linked table.

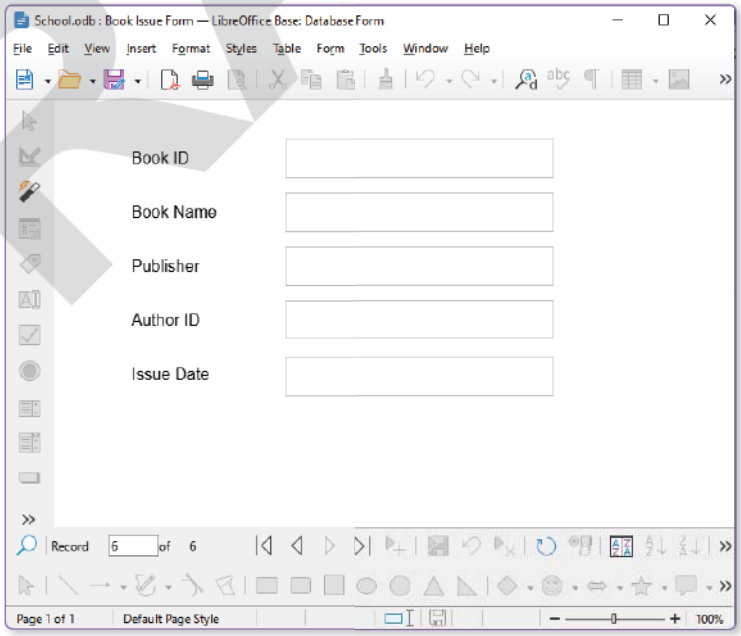
Perform the following steps to enter a new record:

Step 1: Double-click the form under the **Forms** pane. The form opens in the **Form View** displaying the first record.

Step 2: Click on the **New Record** icon from the **Form Navigation** toolbar.

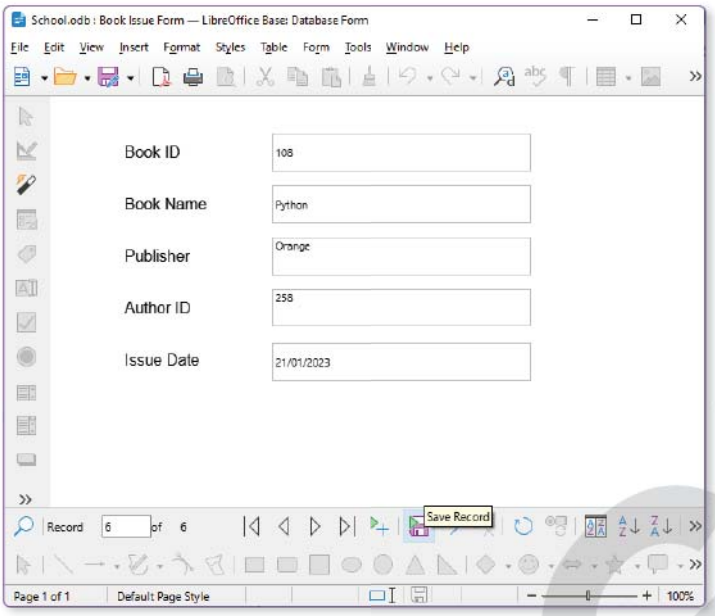


All the fields of the form will be blank.

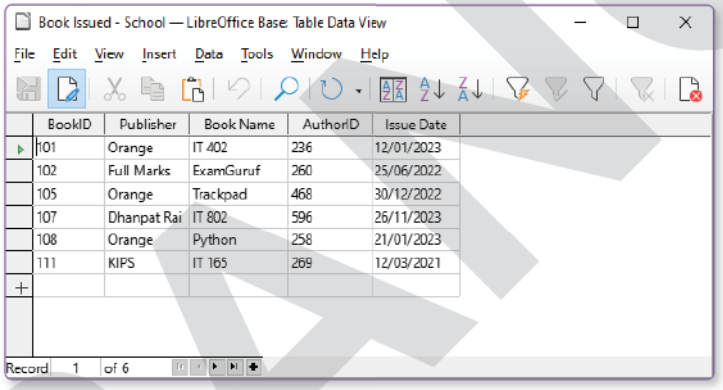


Step 3: Enter new values in the blank field of the form.

Step 4: Click on the **Save Record** button from the **Form Navigation** toolbar.



The record will be saved in the linked table. You can see the added record in the selected table in Datasheet View of the table.

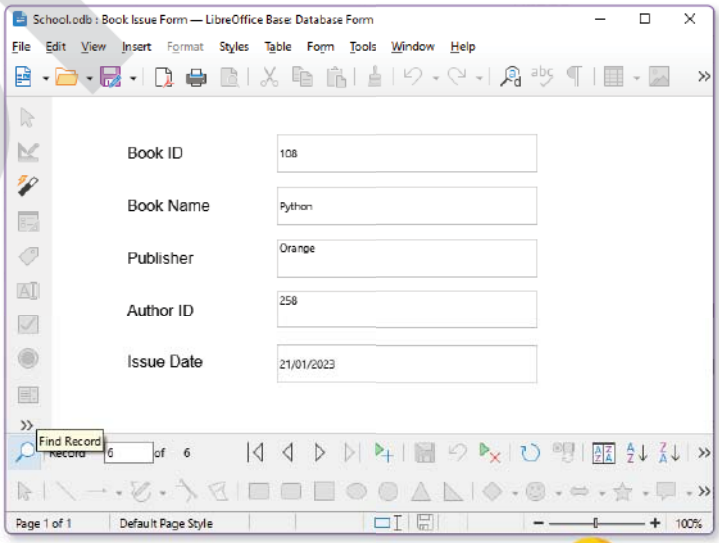


Searching a Record

Perform the following steps to search a record:

Step 1: Double-click on the form under the **Forms** pane. The form opens in the **Form View** displaying the first record.

Step 2: Click on the **Find Record** icon from the **Form Navigation** toolbar. The **Record Search** dialog box appears.

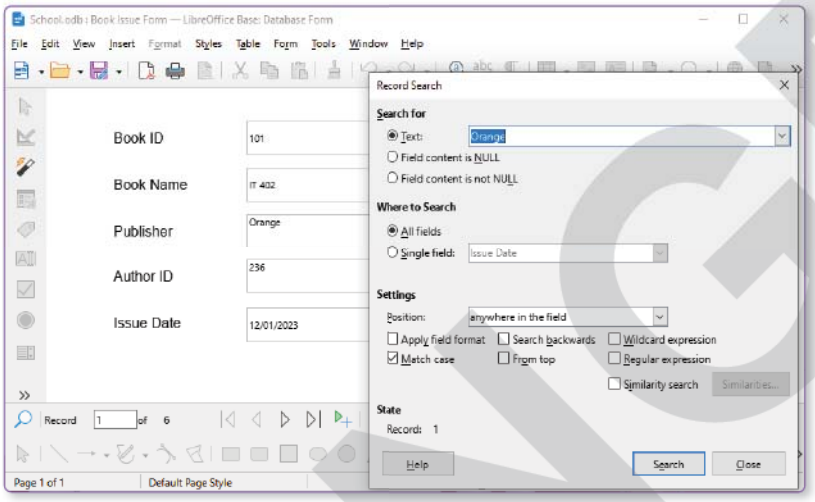


Step 3: Type any text related to the record you want to search in the combo box given in front of the **Text** radio button. In this case, we have typed the text **Mother Board**.

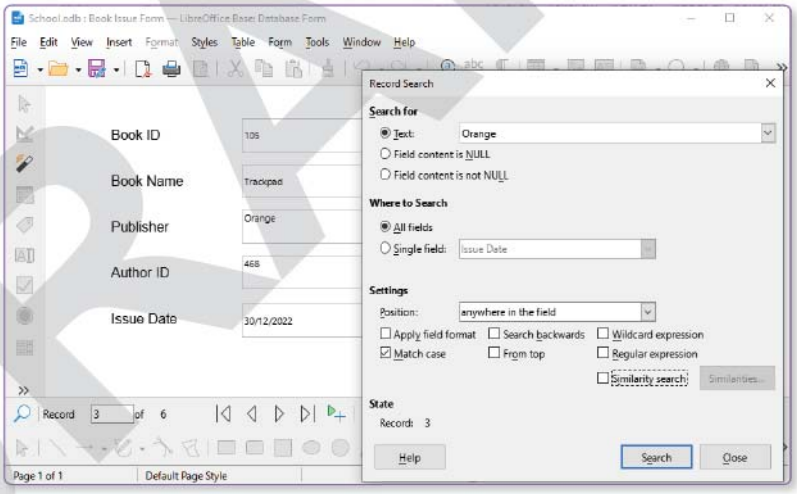
Step 4: Select the **All fields** radio button under the **Where to search** to specify the range for searching a record. You can use the **Single field** radio button if you want to search a record according to a particular field.

Step 5: Specify other settings given under the **Settings** group. In this case, we have checked the **Match case** check box.

Step 6: Click on the **Search** button. If the table linked with the form contains the searched record, the record appears in the form.



If there are multiple instances of the searched keyword in the linked table, then you need to click the **Search** button again to see other instances in the form.



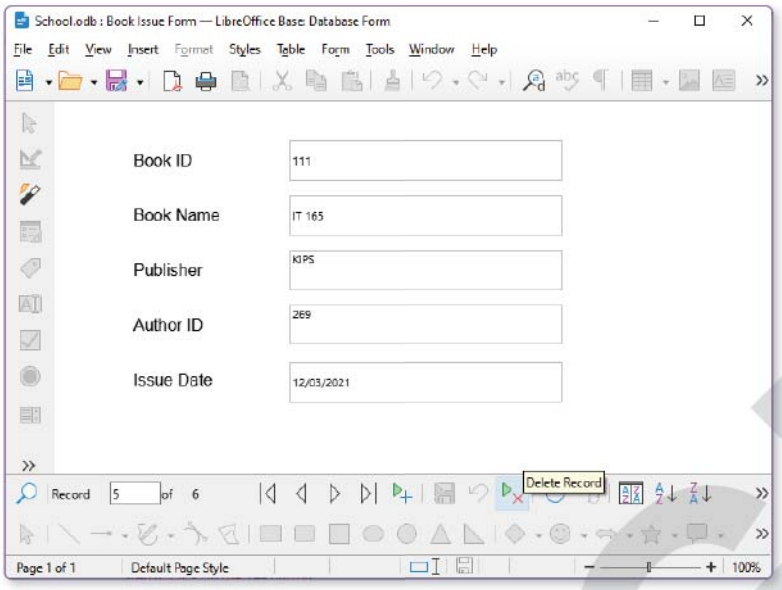
Deleting a Record

Perform the following steps to delete a record:

Step 1: Double-click on the form under the **Forms** pane. The form opens in the **Form View** displaying the first record.

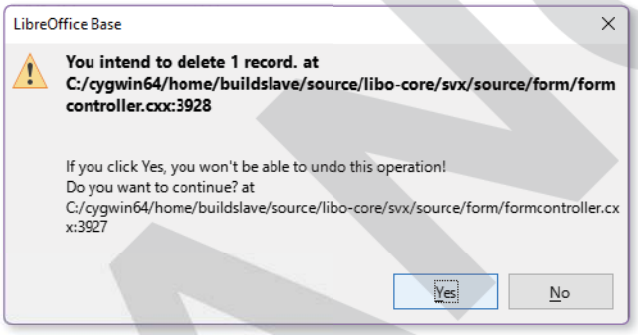
Step 2: Go to the record that you want to delete by using the navigation icons given on the **Form Navigation** toolbar.

Step 3: Click on the **Delete Record** button.



A dialog box appears asking to delete the record.

Step 4: Click on the **Yes** button.



The record will be deleted from the linked table. The next record will be displayed in the form.

WHAT IS REPORT?

A report displays the retrieved data in an appealing and customised format. Reports can be created from a table, a query, or both. Ideally, if a report needs to be generated from multiple tables, it is recommended to first create a query and then use that query to generate the report.

There are two ways to create a report:

- Use Wizard to Create Report
- Create Report in Design View

Use Wizard to Create Report

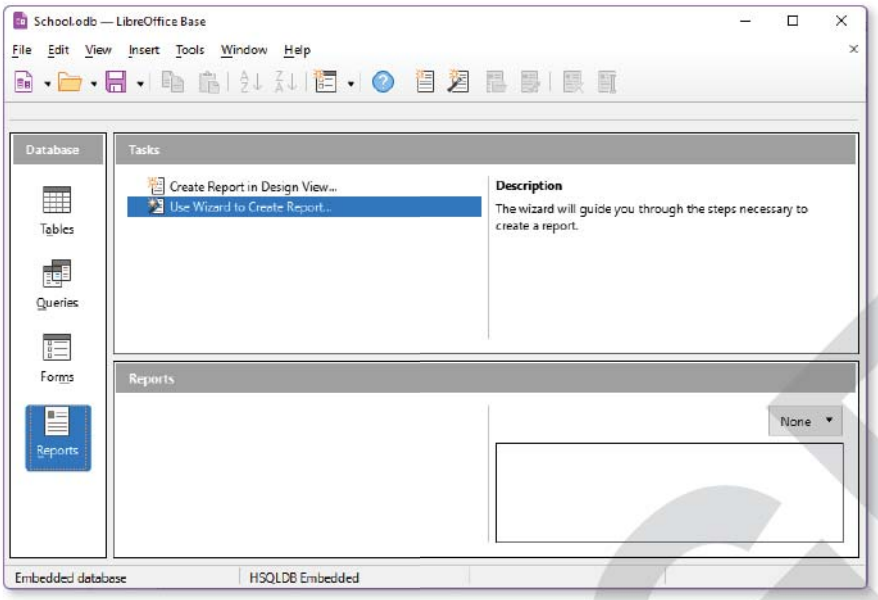
Creating a report using a wizard involves guiding the user through a step-by-step process to collect information or complete a task.

Follow the given steps to create a report using a wizard:

Step 1: Open the **School.odb** database.

Step 2: Select **Reports** option in the **Database** pane.

Step 3: Click on the **Use Wizard to Create Report** option from the **Tasks** pane.



The **Report Builder** window open with the **Report Wizard**. The Report Wizard contains the six steps.

Step 4: **Field Selection:** Select the table and the corresponding fields that you want to display in the report.

Which field you want to have in the report?

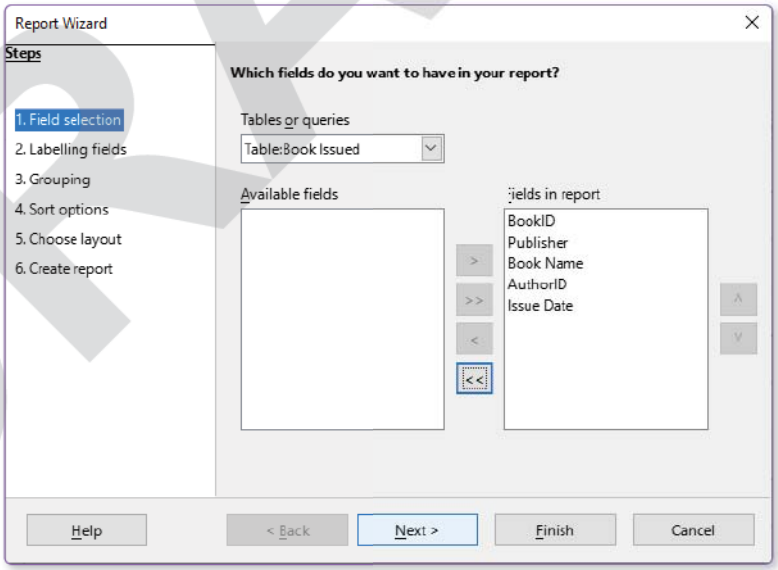
Tables or queries: Select the desired table or query. In this case, we have selected the **Book Issued** table.

Available fields list box: The field of the selected table will be displayed.

Select the **BookID** option from the **Available fields** list box and click on the > button to move the selected field to the **Fields in report** list box.

Similarly, move the **Publisher**, **Book Name**, **Author ID, Issue Date** fields from the **Available fields** list box to **Fields in report** list box.

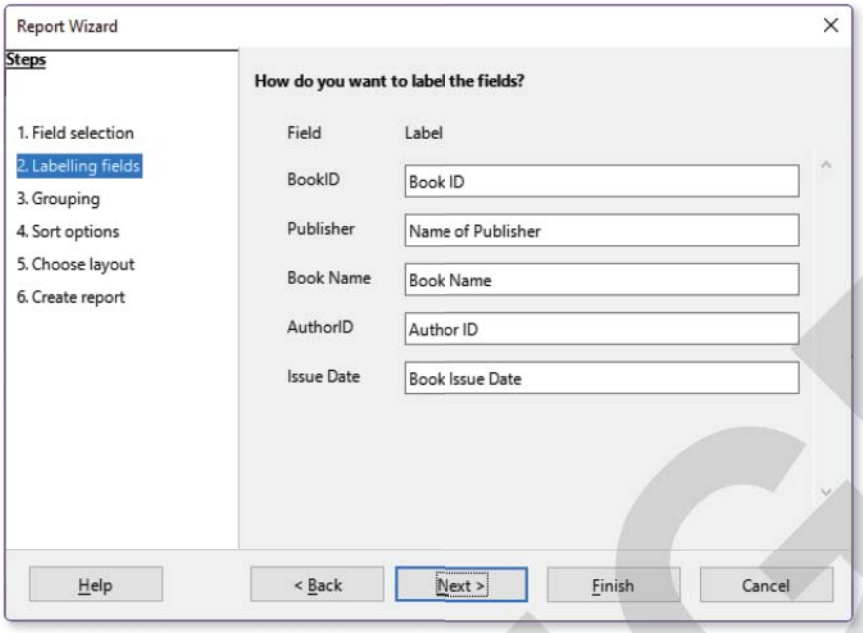
Click on the **Next** button to move to the next step of the wizard.



Step 5: **Labelling Fields:** This step allows you to change the field labels with new values. By default, the field values will be displayed as column headers. Since field names are usually abbreviated, you can change them to more descriptive names by typing the new names in the corresponding text boxes.

Change the field labels with the new values as Book ID, Name of Publisher, Book Name, Author ID, Book Issue Date.

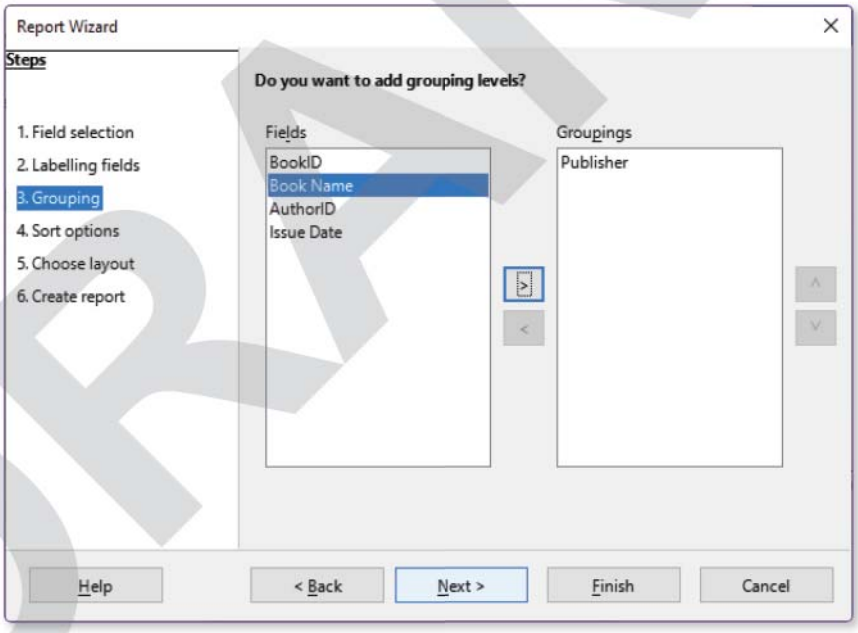
Click on the **Next** button to move to the next step of the wizard.



Step 6: **Grouping:** This step allows you to group the data based on any of the fields in the report.

Select the field in the **Fields** list box and click the > button to move the filed in the **Grouping** list box. In this case, we have selected the **Publisher** field.

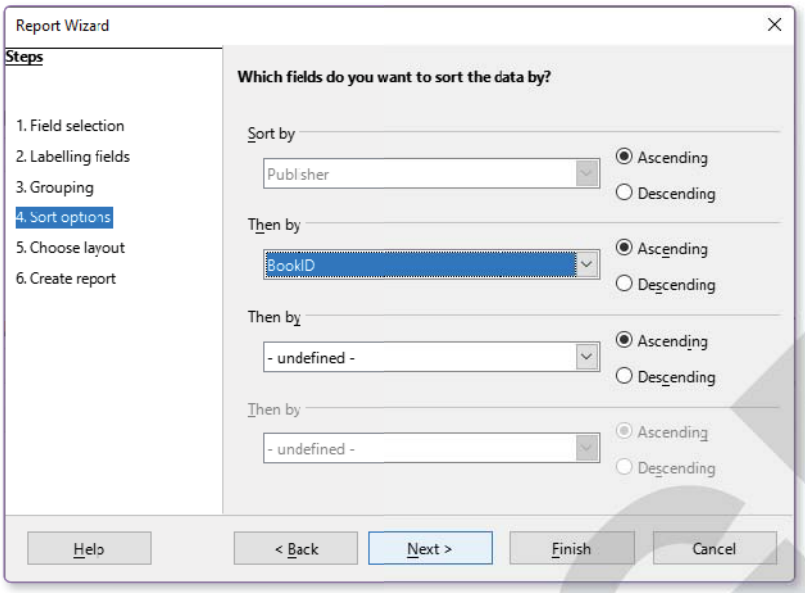
Click on the **Next** button to move to the next step of the wizard.



Step 7: **Sort options:** This step allows you to sort the data in either ascending or descending order based on a particular field in the report.

Let's rearrange the records in the report— Publisher wise in ascending order because, we have grouped the data based on Publisher field previously. Within publisher the records will be rearranged Book ID in the ascending order.

Click on the **Next** button to move to the next step of the wizard.



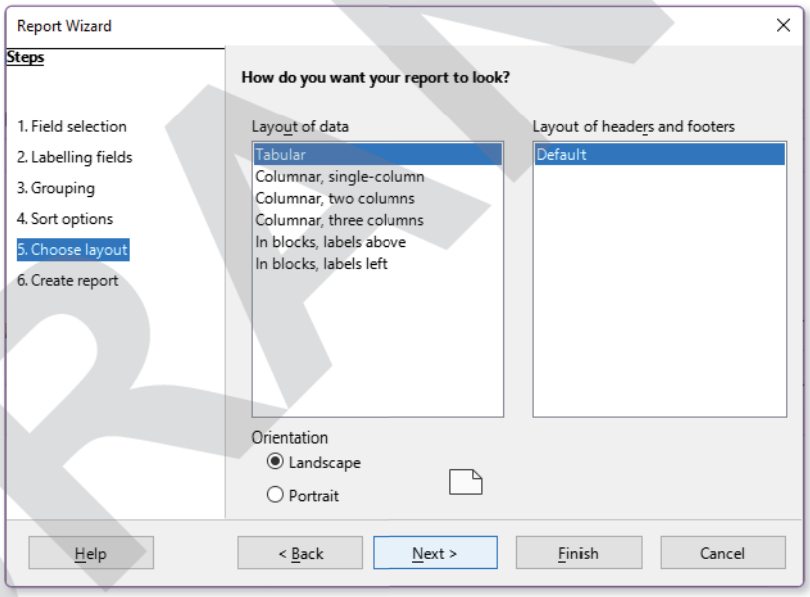
Step 8: **Choose layout:** This step allows you to choose layout for report data as well as header and footer.

Select the layout of the report data in the **Layout of data** list box as **Tabular.**

Select the layout of the report header and footer in the **Layout of headers and footers** list box as **Default**.

Select the orientation either **Landscape** or **Portrait** as **Landscape.**

Click on the **Next** button to move to the next step of the wizard.



Step 9: **Create report:** This final step allows you to give the title to report, specify the type of report, as well as specify the way we want to proceed after the wizard finishes.

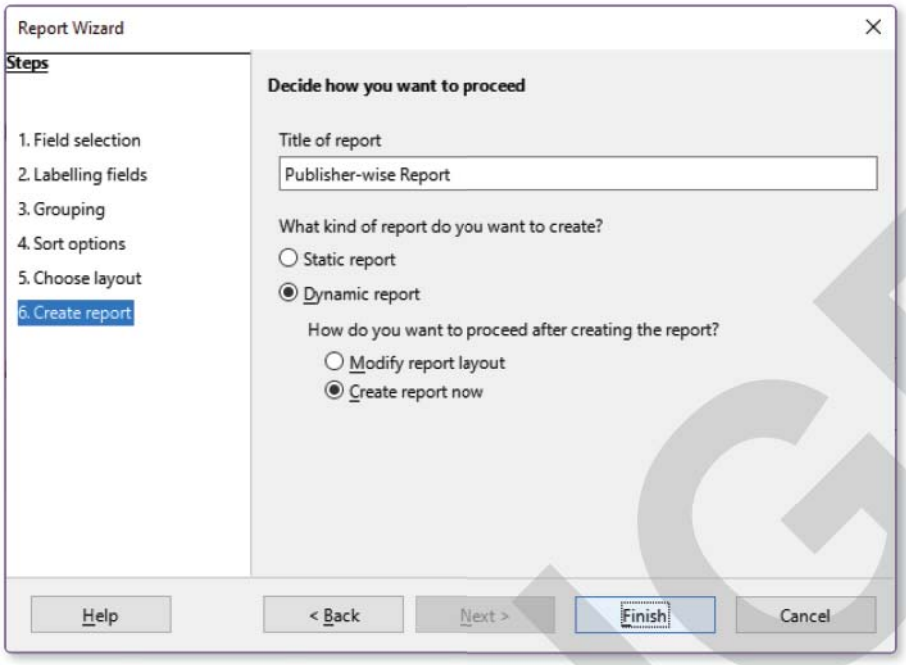
Reports can be **static or dynamic**. Static reports contain the data in the selected fields at the time the report was created. Dynamic reports (default) contain data which will be updated as soon as changes are made in the table. So, it shows the latest data.

Enter the name of the report in the **Title of Report** as **Publisher-wise Report**.

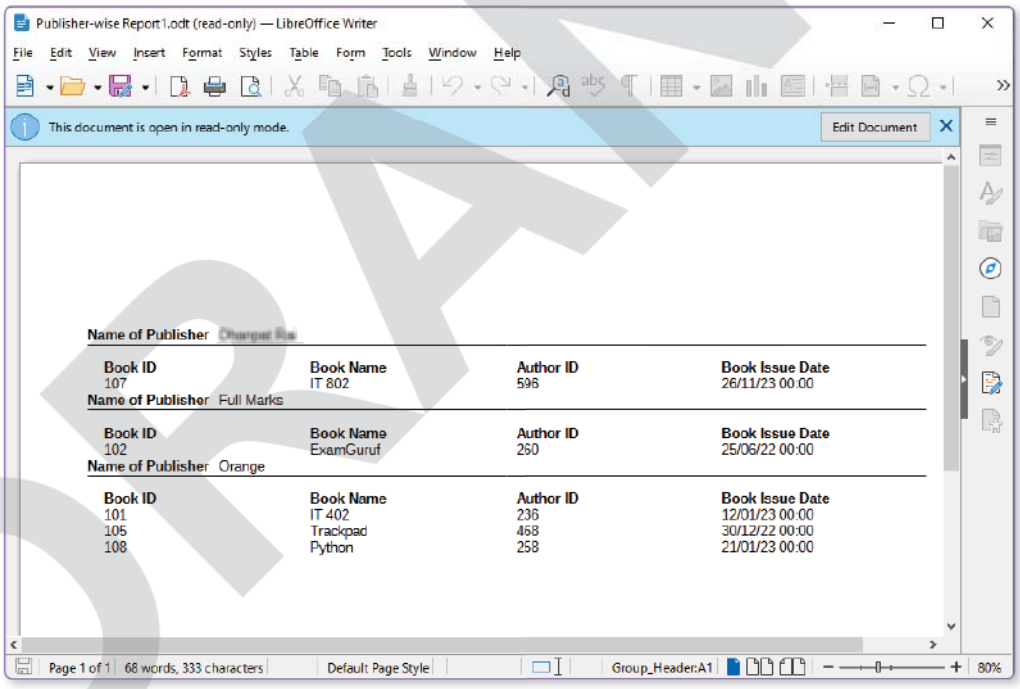
Select the desired radio button in the **What kind of report do you want to create?** (Section to specify whether you would like to modify the report after creating it or not.) as **Dynamic**.

Select the desired radio button to specify **how do you want to proceed after creating the report?** as **Create report now.**

If you wish to modify the report after the wizard finishes, select the **Modify report layout** radio button. Click on the **Finish** button to create a report.



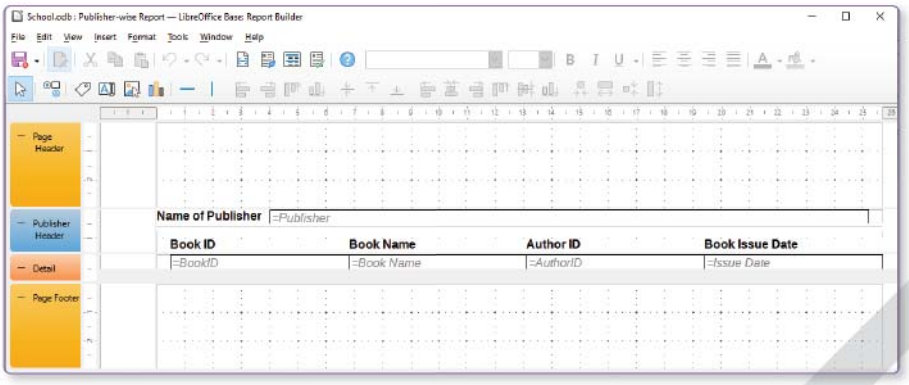
The report is created and displays in the LibreOffice Writer document.



Inserting Controls in the Report

LibreOffice Base allows user to enhance a report's appearance and functionality by inserting different controls. These controls help to add different elements such as titles, author name, and date of report generation that makes the report more informative and visually appealing.

You can insert control in the report by right-clicking the report in the **Reports** pane and then select the **Edit** option from the context menu. This will open the **Report Builder** window. This window contains the **Report Controls toolbar** that contains the various controls.



Inserting Titles and Headings

You can insert title and heading in a report by adding labels in it.

Follow the given steps to insert title and headings in a report:

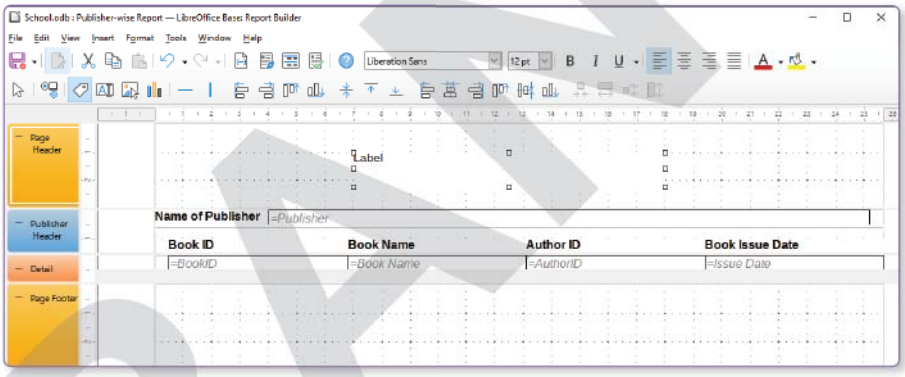
Step 1: Right-click the report in the **Reports pane**

Step 2: Select the **Edit** option from the context menu.

The **Report Builder** window.

Step 3: Select on the **Label** tool available on the **Report Controls** toolbar.

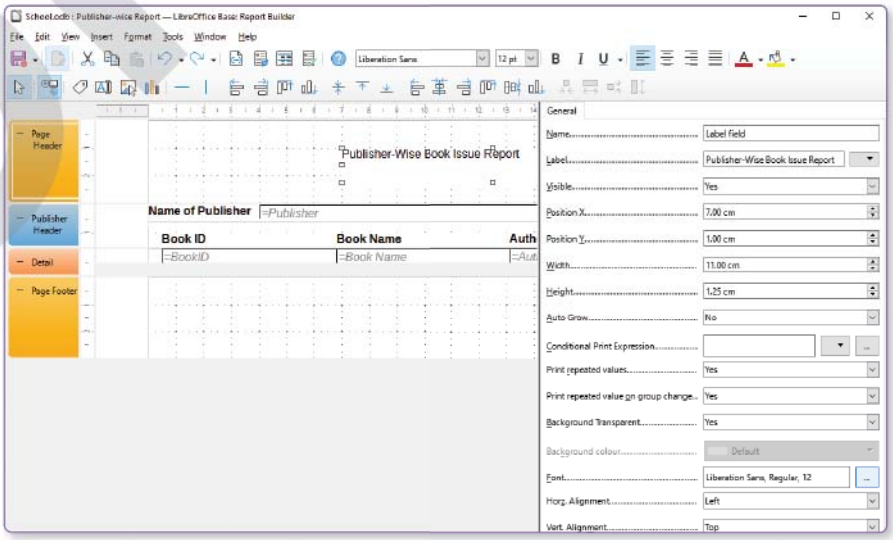
Step 4: Click and drag the mouse-pointer to insert the label in the report.



Step 5: Double-click on the **Label** box to open the **Properties** panel.

Step 6: Enter the desired title in the **Label** text box as **Publisher-wise Book Issue Report**.

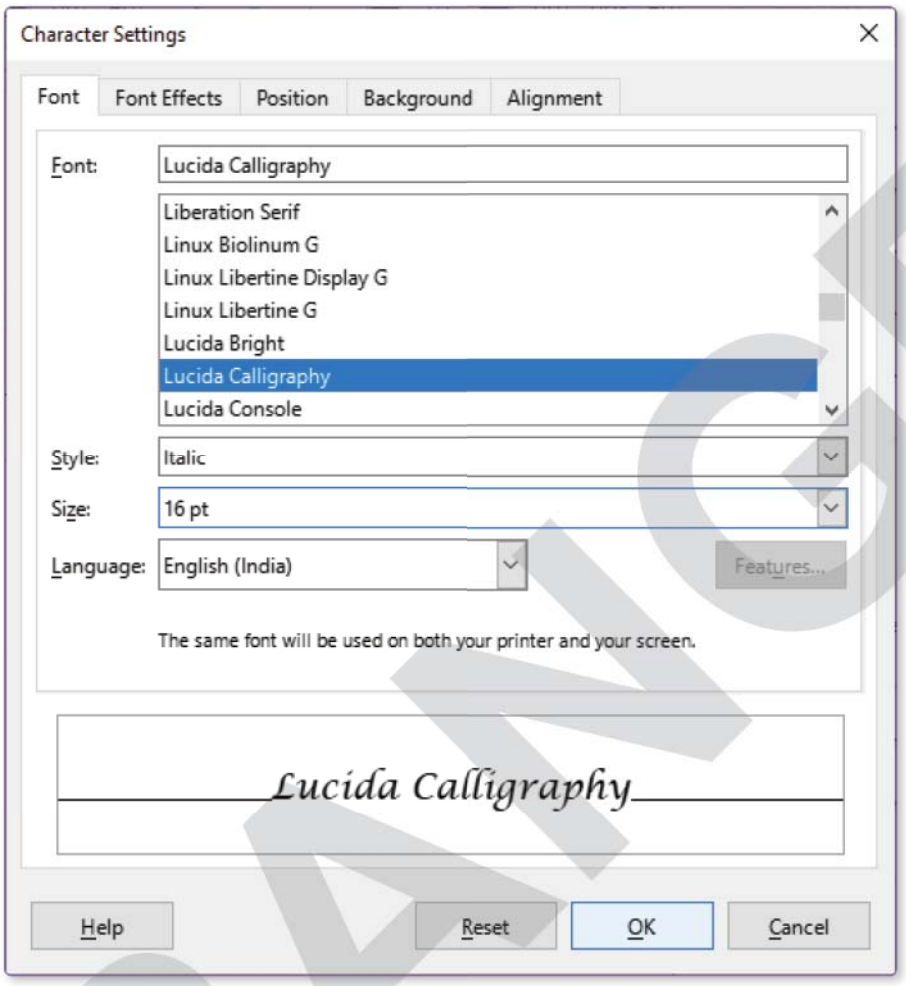
Step 7: Click on the ... button in beside the **Font** text box in **Properties** panel.



The **Character Settings** dialog box opens.

Step 8: Change the font type, style and size in the **Character Settings** dialog box.

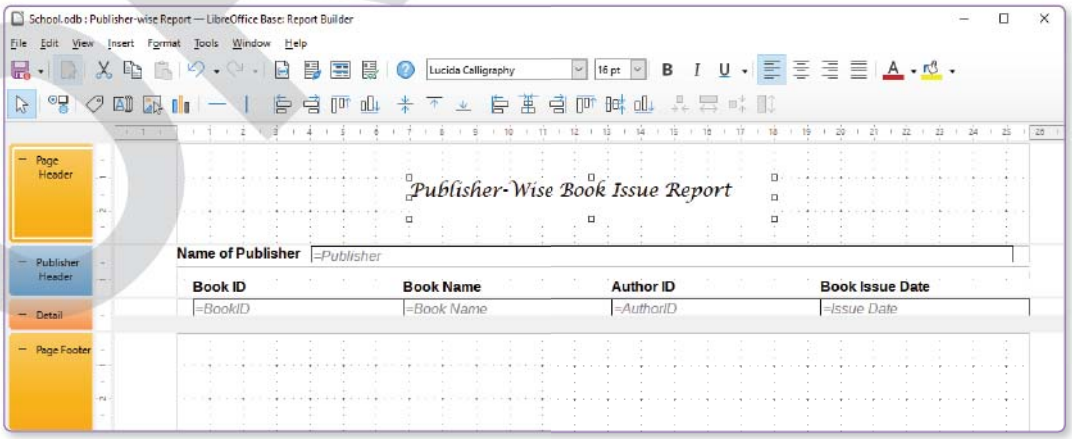
Step 9: Click on the **OK** button.



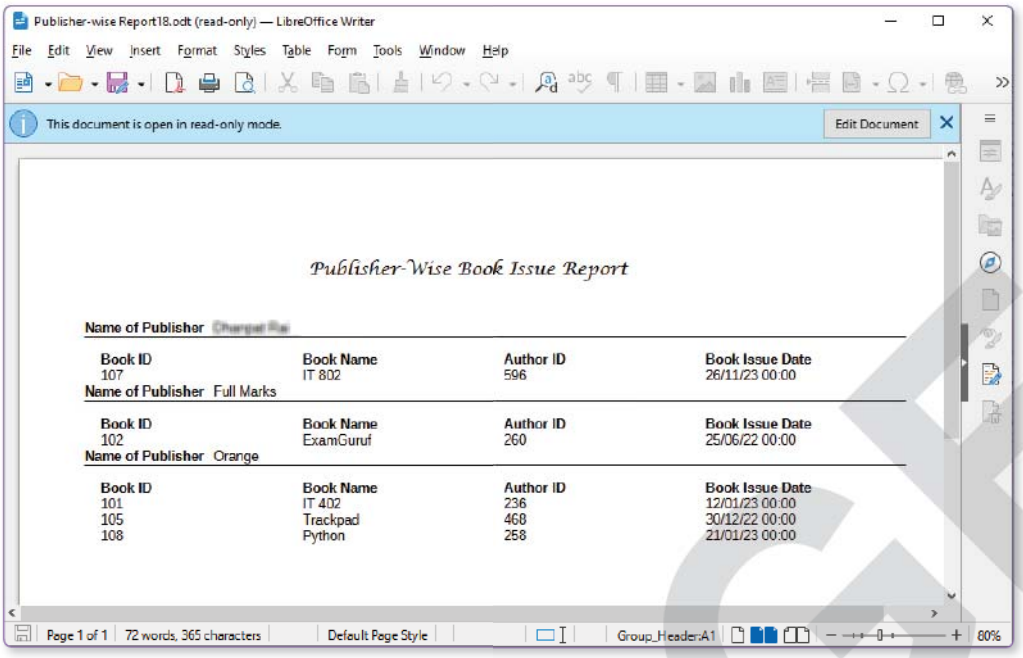
The Label is modified according to specified font settings.

Step 10: Click the **Properties** button in the **Report Controls** toolbar to hide or show the **Properties** panel.

The label is displayed in the Report Builder window.



The report will be displayed with the formatted effects.



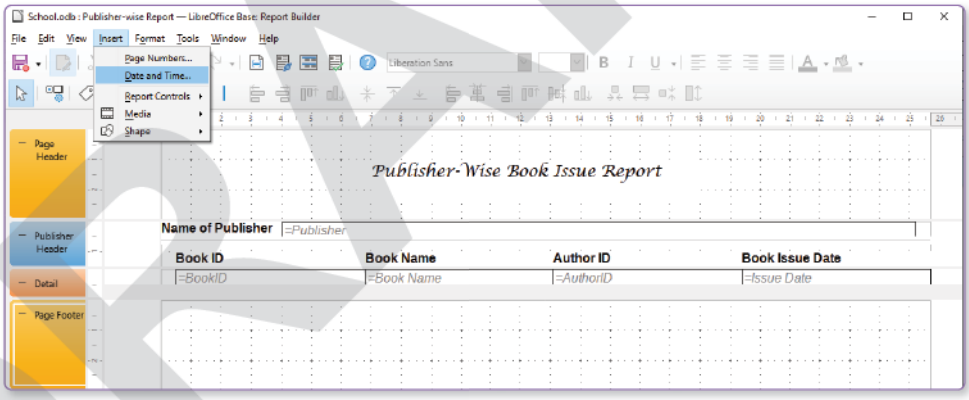
Inserting Date and Time

After creating the report, we can add different types of fields from the Insert menu in the report. Let us add date and time in the report. Perform the following steps to add date and time in a report:

Step 1: Open the report in the **Report Builder** window.

Step 2: Click in the **Page Footer** area to make it active.

Step 3: Click the **Insert → Date and Time** option in the menu bar.

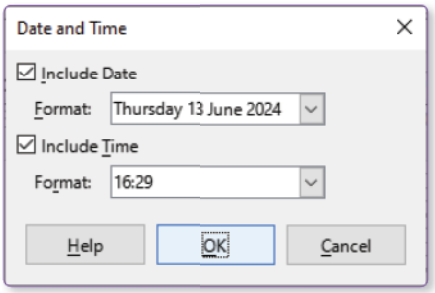


The **Date and Time** dialog box opens.

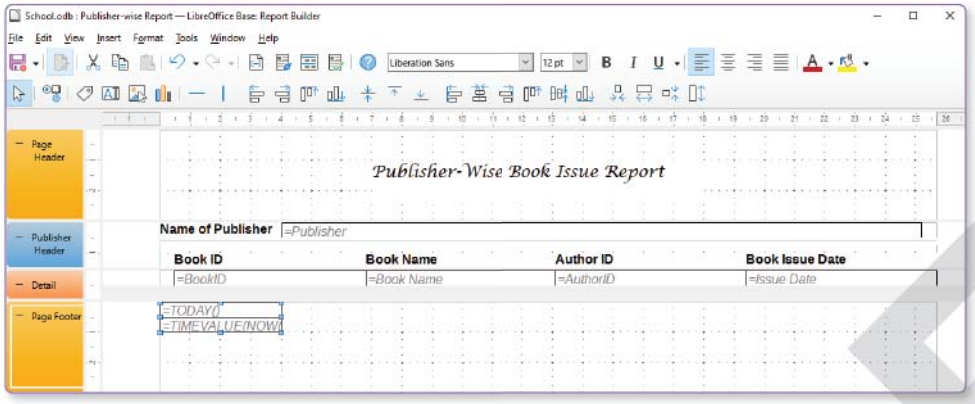
Step 4: Select the **Include Date** check box and select the desired format for date.

Step 5: Select the **Include Time** check box and select the desired format for time.

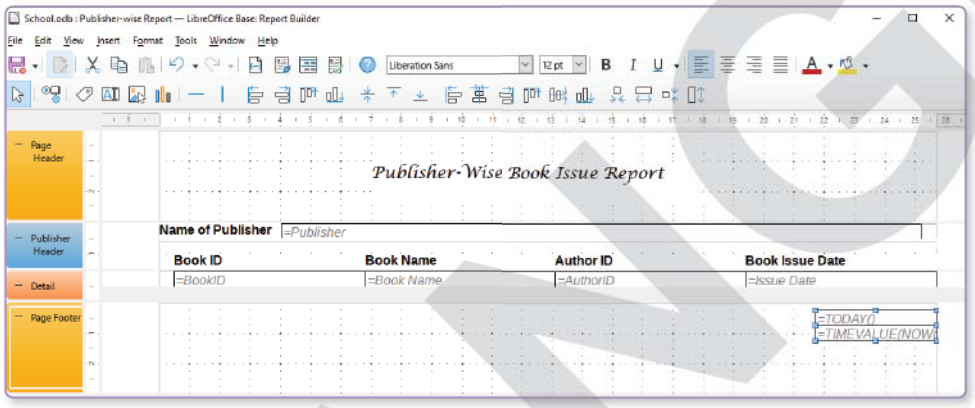
Step 6: Click on the **OK** button.



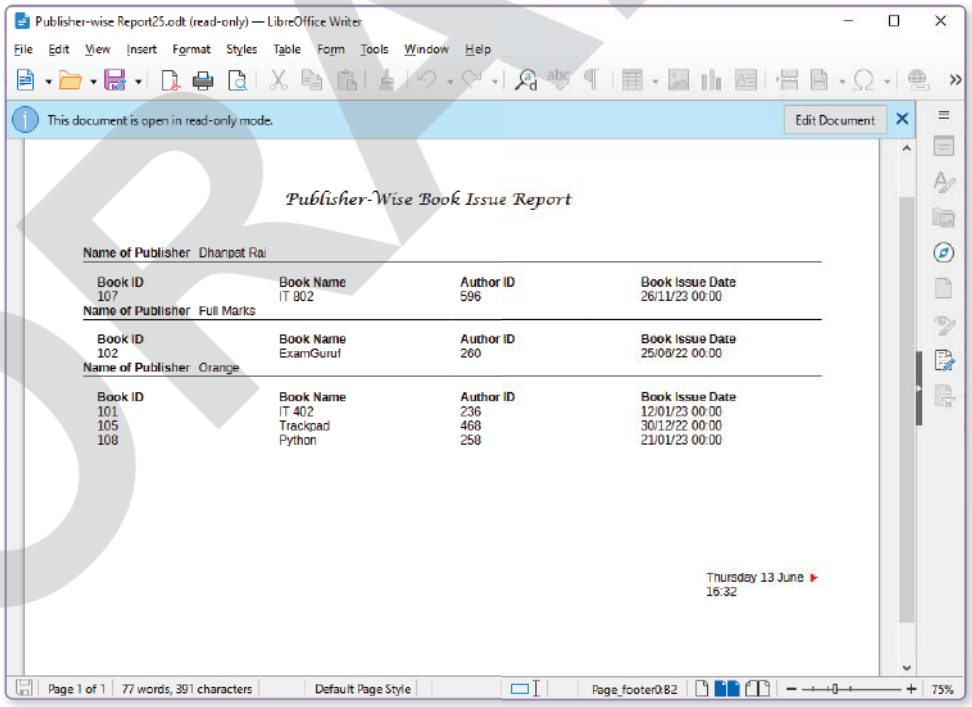
The date and time will be inserted on the left corner of the **Page Footer** area.



Step 7: Click and drag the date and time to reposition it in any place in the **Page Footer** area.



The report will be displayed with the data and time.



REVISIT

- A database is an organised collection of structured information or data, typically stored in tabular format.
- Data is a collection of values in the form of text, numbers, dates, images, audios, videos, etc
- Flat file stores data in a plain text format.
- Relational file stores data of different data types like text, number, date in the form of rows and columns to form a table.
- Information is processed, organised, and meaningful data that provides context, relevance, and value.
- To store and manage the data in a database electronically we use a Database Management System software.
- A data model in Database Management Systems (DBMS) is a conceptual representation of how data is organised and structured within the database.
- The relational database model is a conceptual framework used to organise and structure data in a tabular format, consisting of rows and columns.
- Tables are the basic structure of a database where data is stored.
- Fields or columns are the individual pieces of data stored within a table.
- Key is a field or combination of fields that uniquely identify a record (row) in a table.
- Relationships define how tables within a database are related to each other.
- Constraints are rules that enforce data integrity within a database.
- A primary key uniquely identifies each record (row) in a table.
- In a Relational Database Management System (RDBMS), objects are fundamental entities used to store, represent, or manipulate data within the database.
- Data types help you define the type of the data that can be stored in a field/ column.
- A wizard is a step by step process of doing a specific task through a set of dialog boxes.
- Referential integrity is a fundamental rule in relational databases that ensures the consistency and validity of relationships between tables.
- Query is a set of commands that generates a request to access or manipulate data in a table.
- Filtering can be defined as the process of using a query to filter the records based on the criteria so that only the records matching the criteria will be available to the user thus hiding the data which is not needed.
- Wildcard characters are used to retrieve a set of records from a table that contains some specified character.
- Structured Query Language (SQL) is the standard language for managing relational databases and performing various operations on the data in the tables.
- Form is a database object which is used to create an interactive user interface by connecting it with a table.
- Tooltips are a great way to provide additional information about the Form controls. This information will be displayed when you place the mouse pointer over the Form control and it is called the tool-tip text or help text.
- A report displays the retrieved data in an appealing and customised format.

Solved

SECTION A (Objective Type Questions)

A. Choose the correct option.

1. Which of the following is not an example of a database?
   a. MySql
   b. MongoDB
   c. LibreOffice Base
   d. FileMaker Pro
2. _____ is a collection of related data stored in the form of rows and columns.
   a. Rows
   b. Column
   c. Database
   d. Table
3. Name the relationship in which one record of master table is related to only one record of transaction table.
   a. One to One
   b. Many to One
   c. One to Many
   d. Many to
4. _____ data type takes the values in the form of 0 and 1 in the database. [CBSE Sample Paper 2021]
   a. Integer
   b. Text
   c. Boolean
   d. Memo
5. Database is made up of all the following components except.
   a. tables
   b. queries
   c. forms
   d. formula bar
6. Which of the following is not a database object?
   a. Lists
   b. Queries
   c. Reports
   d. Forms
7. Duplication of data is known as _____.
   a. data security
   b. data incomplete
   c. data redundancy
   d. data inconsistency
8. For what memo data type is used?
   a. To add table
   b. To store objects created in other programs
   c. For long text entries
   d. For short text entries
9. Out of the following, which one is the most appropriate data field in context of employee table, if only one of these is required?
   a. Age_ in_ years
   b. Date_ of_ birth
   c. Age_ in_ days
   d. Age_ in_months
10. Aadya wants to create a connection between two or more tables. Suggest her the option to accomplish the task. [CBSE Sample Paper 2021]
    a. Table
    b. Form
    c. Relationships
    d. Sorting
11. Rudraksh wants that the name column of a table must not be left blank. Help him to identify the field property for this purpose. [CBSE Sample Paper 2021]
    a. Length
    b. Default
    c. Entry required
    d. Format

12. _____ are a great way to provide additional information about the Form controls.
    a. Tooltips
    b. Label
    c. Format
    d. Text

13. It enables users to view, enter, and change data directly in database objects. [CBSE Sample Paper 2023]
    a. Report
    b. Query
    c. Form
    d. Database

14. Suraj wants to create a database for his clients. For this purpose, she needs to store the Email IDs of his clients. Which data type should he use to accomplish this purpose? [CBSE Sample Paper 2023]
    a. Numeric
    b. Varchar
    c. Binary
    d. Boolean

15. _____ is used with WHERE clause to search for a specific pattern in a column.
    a. ORDER BY clause
    b. LIKE operator
    c. INSERT command
    d. GROUP BY clause

16. _____ are used to retrieve a particular record from a table that contains a specified character.
    a. Relationship
    b. Tuple
    c. LIKE operator
    d. Wildcard characters

Ans. 1. d 2. d 3. a 4. c 5. d 6. a 7. c 8. c 9. b 10. c 11. d 12. a 13. c 14. b 15. b 16. d

B. Fill in the blanks.

1. The collection of related _____ arranged in the form of rows and columns will form structured data.
2. _____ is an attribute or a set of attributes whose values match the primary key of another table.
3. _____ is the extension of a database in LibreOffice base.
4. _____ stores data in a plain text format.
5. Data _____ means that the data is accurate and consistent in the database.
6. A row that forms complete information is known as a _____.
7. _____ gives you a window where you enter the names, data types and the description of the fields you wish to create in a table.
8. The _____ data type stores integer range between 0 to 255.
9. The _____ toolbar contains various controls that can be added to the form.
10. A _____ is a step-by-step process of doing a specific task through a set of dialog boxes.
11. A _____ is a piece of text that represents the field on the form.
12. _____ characters are used to retrieve a particular record from a table that contains a specified character.
13. A table can have only _____ primary key in a database.
14. A Relational database uses _____ commands which is a standard user application that provides an easy programming interface for database interaction.
15. A _____ view helps you design a query by specifying the tables and the criteria.
16. _____ is the standard language for managing relational databases and performing various operations on the data in the tables.

Ans. 1. data 2. Foreign Key 3. .odb 4. Flat File 5. Integrity 6. Tuple 7. Design View 8. TINYINT 9. Forms Control 10. Wizard 11. label 12. Wildcard 13. One 14. SQL 15. Design 16. Structured Query Language

C. Match the following:

1. Flat File	a. Ascending
2. Record	b. One to one
3. Attribute	c. Spreadsheet
4. Relationships	d. Row
5. Sort	e. Column

Ans. 1. c 2. d 3. e 4. b 5. a

D. State whether these statements are true or false:

1. In the database, all the data is stored at a centralised location. _____
2. Table is also known as tuple. _____
3. Field contains a set of characters. _____
4. % with like in SQL replaces only one character. _____
5. Relational File stores data of different data types like text, number, date in the form of rows and columns to form a table. _____
6. MySql is not an example of relational database management system. _____
7. A column that stores similar data is known as an Attribute. _____
8. Length property defines the maximum length a field can have to hold a value. _____
9. The field with Entry Required as "No" means that the field cannot be left blank. _____
10. The Field Properties do not allow the user to change properties of the field. _____

Ans. 1. True 2. False 3. True 4. False 5. True 6. False 7. True 8. True 9. False 10. False

SECTION B (Subjective Type Questions)

A. Short answer type questions:

1. What is RDBMS?

Ans. **RDBMS** is an advanced form of Database Management System and is based on a Relational Model. In this model, a relational database has a set of related tables that are interlinked to each other on the basis of a common field. It is a very efficient way of representing data and allows data in a table to be represented in a two-dimensional form and is known as a **Relation**.

2. Write the relationship between a database and a table.

Ans. A database is like a container which stores all the related tables together. A table cannot be created outside a database.

3. What is a primary key in a database? Write any one advantage of a primary key in a table.

Ans. A field which uniquely identifies each record in a table is known as the primary key. e.g. EmpId is the primary key of the Employee table. Admno is the primary key in a Student table. The advantage of a primary key is that it distinguishes one record from another and maintains unique records in a table.

4. What is the difference between 'Rows' and 'Columns' in a table?

Ans. In a table, rows are called records and columns are termed as fields. A row stores complete information of a record whereas a column stores only similar data values for all records.

5. How does a relationship occur between two tables?

Ans. A relationship between two tables occurs through a primary key and a foreign key.

6. Mention the names of any three field properties for numeric data types.

Ans. AutoValue, Length, Default Value, Decimal Places.

7. What is the use of the Entry Required field property?

Ans. The Entry Required field property ensures that the field cannot be left blank. The user needs to enter data in this field.

8. What do you mean by a Query?

Ans. A Query is a set of commands that generates a request to access or manipulate data in a table. A query is of great help when information is required to be extracted from different tables.

9. What are Constraints?

Ans. Constraints are rules that enforce data integrity within a database. They define the conditions that must be met for data to be inserted, updated, or deleted in a table. Common types of constraints include primary key constraints, foreign key constraints, unique constraints, and check constraints.

10. What is SQL?

Ans. Structured Query Language (SQL) is the standard language for managing relational databases and performing various operations on the data in the tables. It would enable us to store, retrieve, and manipulate data in the tables.

B. Long answer type questions:

1. Identify the data type of a given column in table: Airlines.

Columns	Data Type
Flight No	_____
No.of Passengers	_____
Airlines	_____
Arrival Time	_____
Departure Time	_____
Fares	_____

Ans.

Columns	Data Type
Flight No	Text
No.of Passengers	Integer
Airlines	Text
Arrival Time	Date/Time
Departure Time	Date/Time
Fares	Float

2. Define the following:

   a. Data Model b. Database c. Tables

Ans. a. **Data Model:** A data model in database management systems (DBMS) is a conceptual representation of how data is organised and structured within the database. It defines the relationships between different types of data, the constraints that apply to the data, and the operations that can be performed on the data.

b. **Database:** A **database** is a collection of logically related data items stored in an organised manner. The information being stored in a database can be added, modified, deleted or displayed according to the requirements of the user. We are using a database in almost every field. It is used by the school to store information about students and books in the library. When we go shopping then the shopping complex uses a database to maintain the details of stock and customers. Companies use databases to keep track of their employees' information.

c. **Tables:** Tables are the basic structure of a database where data is stored. A table is a collection of logically related records. It is organised as a set of columns, and can have any number of rows. Each row represents a record, while each column represents a field or attribute of that record.

3. The structure of a table "ITEM" is given below. Suggest suitable data type and size of each column. Also Identify Primary Key in this table.

NAME	DATA TYPE	SIZE
ITEMNO	_____	_____
NAME	_____	_____
PRICE	_____	_____
QUANTITY	_____	_____
AMOUNT	_____	_____

Ans.

NAME	DATA TYPE	SIZE
ITEMNO	NUMERIC	5
NAME	VARCHAR	35
PRICE	DECIMAL	5
QUANTITY	NUMERIC	5
AMOUNT	NUMERIC	5

4. Consider the following table:

Emp No	Emp No	Designation
111	Sahil	Executive
222	Anup	Manager
333	Mansi	Head
444	Pooja	Executive

Using the above table answer the given questions:

- Identify the Primary key.
- EmpName has all the unique names. Can it work as a primary key? Justify your answer

Ans. Primary Key – EmpNo

No, Empname cannot work as a Primary key because presently it may have unique values but there are chances that a new employee with the same name can join the company then the field will have duplicate values and so cannot be used as a primary key.

5. Find out which of the following fields of table Bank can be selected as primary key, candidate key and alternate key? Account No, Customer Name, Date of Birth, PAN Number, Opening Balance.

Ans. Primary key - AccountNo

Candidate key - AccountNo and PAN Number

Alternate key - PAN Number

6. Differentiate between a Primary key and Foreign key. Explain with the help of an example.

Ans. **Primary Key:** value can be the value of a single column or of multiple columns. The column or combinations of columns that form the primary key have unique values. At any time, no two rows in the table can neither have same values for the primary key nor can data value for such field be left blank.

Foreign key: It is an attribute or a set of attributes whose values match the primary key of another table. A relationship between two tables matches the primary key of one table with the foreign key of another table.

7. List Numeric and Alphanumeric Datatypes in LibreOffice Base.

Ans. The numeric data types are used to store data in the form of numbers which can be integers or real numbers with decimals. Arithmetic operations can be performed on numeric data.

Data Type	Name	Signed	Description
Tiny Integer	TINYINT	No	Store integer range between 0 to 255
Small Integer	SMALLINT	Yes	Store integer range between -2^{15} to $+ 2^{15}-1$
Integer	INTEGER	Yes	Store integer range between -2^{31} to $+ 2^{31}-1$
Big Integer	BIGINT	Yes	Range between -2^{63} to $+ 2^{63}-1$
Number	NUMERIC	Yes	Unlimited
Decimal	DECIMAL	Yes	Unlimited
Real	REAL	Yes	$5\times e^{-324}$ to 1.79×10^{308}
Float	FLOAT	Yes	$5\times e^{-324}$ to 1.79×10^{308}
Double	DOUBLE	Yes	$5\times e^{-324}$ to 1.79×10^{308}

Alphanumeric/Text Data Type

It stores a set of numbers, alphabets or other characters. No arithmetic calculations can be performed on text data. We can use this data type for creating name, address, city, customer name, product name, product description, etc.

The list of available Alphanumeric/ Text Data type is:

Data Type	Name	Description
Memo	LONGVARCHAR	Store up to the max length or number indicated by user. It is used to store some descriptive data having more than 255 characters. Memo data type allows to store text data up to 64000 characters. For example: Medical description of a patient, Student achievement details in student table.
Text (fix)	CHAR	Store exactly the length specified by user. It is used to store fixed number of characters. For example: Mobile number, Pincode, License Number, Passport Number, etc.
Text	VARCHAR	Store up to the specified length. The number of bytes allocated depends on the number of characters. For example if Name in student table is VARCHAR(20) and you save name as "Vedika" which has 7 characters then only 7 bytes out of 20 will be used.
Text	VARCHAR_ IGNORECASE	Store up the specified length. Comparisons are not case sensitive but stores capitals as you type them.

8. List down the objects of a database.

Ans. Some common objects in a database include:

- **Tables:** Tables are structured collections of data organised into rows and columns, forming a grid-like structure. Each row represents a single record or entry in the database, while each column represents a specific attribute or field pertaining to that record. Tables provide a logical and efficient way to organise data, enabling users to store, retrieve, and manipulate information with ease. They serve as the primary building blocks upon which the entire database is constructed.
- **Queries:** Queries are powerful tools within an RDBMS that allow users to extract, manipulate, and analyse data stored in the database. Queries allow users to obtain the precise information they need for various purposes, such as reporting, analysis, or application development.
- **Forms:** Forms serve as user interfaces that facilitate the input, editing, and viewing of data within an RDBMS. They provide a user-friendly way to interact with the database, allowing users to input data through graphical elements such as text boxes, drop-down menus, checkboxes, and buttons.
- **Reports:** Reports are formatted presentations of data generated from the database, typically in the form of structured documents or visual representations. They provide a concise and meaningful summary of information derived from the underlying data, often organised into tables, charts, graphs, or narratives.

C. Competency-based/Application-based questions:

21st Century Skills #Communication #Leadership & Responsibility

1. A restaurant wants to maintain the list of their customers in a RDBMS.

a. Suggest him a few RDBMS software.

b. Name a few columns that can be created for storing customer information.

c. Which column can be created as a Primary key?

d. What is another name for a row and a column in RDBMS?

Ans. a. Oracle, IBM DB2, LibreOffice Base, Microsoft SQL Server, Microsoft Access, PostgreSQL, MySQL, FoxPro, and SQLite.
b. Few columns can be Customer Code, Customer Name, Address, Phone number, City.
c. Customer code can be created as a Primary Key.
d. Another name for row is Tuple and for column is Attribute.

2. Your friend owns a chemist shop, he needs to keep records of the medicines with their id's, date of purchase, expiry date, price, etc. in a database program. But he does not have any knowledge about the database. Explain to him the following to get a better understanding of the DBMS concepts.
   a. What is DBMS? Explain in brief.
   b. Name any two database programs which can be used to create a table and store the data as per the requirement.
   c. Which field can be set as a Primary Key?
   d. Is it possible to make more than one field as a primary key in your table? (Yes/No). Justify your answer.

Ans. a. A database management system is a software package with computer programs that controls the creation, maintenance, and use of a database. It allows organisations to conveniently develop databases for various applications.
b. Two databases are: i. Microsoft Access ii. MySQL iii. LibreOffice Base.
c. Id field will be suitable for Primary Key.
d. No, we cannot make more than one column as a primary key in a table because it is uniquely identify a record in the table.

3. A teacher has created a list of students' details and marks in a database. She is not very familiar with the use of the database. Help her in setting a few field properties and where are these field properties available:
   a. Generate the roll numbers automatically.
   b. The name field should have a maximum of 20 characters.
   c. Marks should store value upto 1 decimal place.
   d. Display the date of birth in dd-month-yyyy format.
   e. Wanted to keep the place as default 'Delhi'.

Ans. The field properties are available in the Design view of the table.
a. Autovalue
b. Length
c. Decimal Value
d. Format
e. Default

Assertion and Reasoning Questions:

Direction: Questions 4-5, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions selecting the appropriate option given be-low:

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

4. **Assertion (A):** The TINYINT data type can store values from -128 to 127.
   Reasoning (R): TINYINT is an unsigned data type that can store integer values ranging from 0 to 255.

Ans. d

5. **Assertion (A):** A primary key is a column or set of columns that uniquely identifies each row in a table.
   Reasoning (R): A primary key can contain duplicate values to ensure data integrity.

Ans. d

Statement Based Questions:

Two statements are given. Statement 1 and Statement 2. Examine the statements and answer the question according to the instruction given below.

a. Statement 1 is TRUE, Statement 2 is TRUE
b. Statement 1 is FALSE, Statement 2 is False
c. Statement 1 is TRUE, Statement 2 is False
d. Statement 1 is FALSE, Statement 2 is TRUE

6. **Statement 1:** The TINYINT data type is always signed and can store values between -128 and 127.

   Statement 2: The NUMERIC data type is designed to store floating-point numbers with variable precision.

Ans. b

Unsolved

SECTION A (Objective Type Questions)

A. Choose the correct option.

1. The intersection point between a row and column is called _____.
   a. Row
   b. Column
   c. Table
   d. Cell
2. In database helps us to retrieve the filtered data based upon some conditions.
   a. Forms
   b. Reports
   c. Queries
   d. Table
3. A table is a set of data elements that is organized using a model of vertical _____ and horizontal _____.
   a. Rows, Tables
   b. Columns, Rows
   c. Rows, Columns
   d. Forms, Reports
4. Vinay wants to store a huge amount of information about his firm in a database. Which type of table organization would be most suitable for this purpose?
   a. Relational
   b. Flat File
   c. Either Relational or Flat file
   d. Hierarchical
5. The user cannot enter data in the field that is assigned as _____.
   a. AutoValue
   b. Default Value
   c. Format value
   d. Entry required
6. Which of the following is not an example of Numeric data type?
   a. DateofBirth
   b. Rollno
   c. Price
   d. Marks
7. Identify the mode, where we can modify in the structure of table?
   a. Datasheet view
   b. Design view
   c. Structure view
   d. All of these
8. Identify the property which help to set the number of characters in text/ varchar type field of a table in DBMS.
   a. Entry Required
   b. Size
   c. Default Value
   d. Length
9. Reports are formatted presentations of data generated from a database.
   a. Query
   b. Table
   c. Reports
   d. RDBMS
10. The _____ Data Model has multiple records linked to same master file.
    a. Network
    b. Hierarchical
    c. Relational
    d. Database

B. Fill in the blanks.

1. To create a form you need to select _____ option available under Database section.
2. A foreign key is a reference of the _____ key in another table.
3. A _____ is helps to collect specific information from the pool of data in the database. [CBSE Handbook]
4. The candidate key, which is not used as the primary key is called _____ key.
5. The data values for all the fields related to a person or object is called a _____.

6. All the field values that are eligible to be the primary key are the _____ keys for that table.
7. A _____ refers to the type of data that will be stored in that particular field.
8. The data can be entered in a table only in _____ view.
9. The _____ data type is used to store digitized images.
10. _____ means rearrangement of the data either in the ascending order or in the descending order.

C. State whether these statements are true or false:

1. LibreOffice base is an open source RDBMS.
2. In a table, a record for a particular entity should not be repeated.
3. In one-to-many relationship, one specific record of the master table has more than one corresponding records in the related transaction table.
4. The records once entered can be edited anytime in a table.
5. The properties of a field change according to the data type selected.
6. A data type refers to the type of data that will be stored in that particular field.
7. Views are virtual tables that are created based on the result of a table.
8. A table is a collection of logically related records.
9. In Hierarchical Data Model, the data is organised into a file like structure.
10. A form is a feature of a database using which we can enter data in a table in an easy and user friendly manner.

D. Match the following:

1. Row	a. True/False
2. Integer	b. No data entry
3. AutoValue	c. RDBMS
4. Boolean	d. Data Type
5. Constraint	e. Tuple
6. MY SQL	e. Primary Key

SECTION B (Subjective Type Questions)

A. Short answer type questions:

1. How Entry Required and Default Value properties of a table field in a database are different from each other? [CBSE Sample Paper 2022]
2. Explain the term Data Redundancy.
3. What is Referential Integrity? Explain its two (any) purposes. [CBSE Sample Paper 2022]
4. What are Reports in a database?
5. What is a data model?
6. Explain Memo data type in database.
7. What is the purpose of using queries?
8. What is DBMS? Explain any two advantages of DBMS.
9. What is the significance of Default Value in field properties window?
10. Differentiate between Design View and Datasheet view.

B. Long answer type questions:

1. Give any four advantages of a DBMS.
2. How many types of relationships can be created in Base? Explain each of them. [CBSE Handbook]
3. List different ways of creating tables in a database.
4. What do you mean by Sorting? In how many ways can it be done? [CBSE Handbook]
5. How to open an existing table in a database? Give two ways to do this.
6. Differentiate between Forms and Reports.

7. Write the function of Forms Controls toolbar and Records toolbar.
8. Write the function of Forms Controls toolbar and Records toolbar.

C. Competency-based/Application-based questions:

21st Century Skills #Communication #Leadership & Responsibility

1. Ananya wants to use a database in her bookshop. Suggest a database object to do the following:
   a. To store the information of the total stock in the tabular form.
   b. Design an interactive screen to enter and display the information.
   c. Create a report of stock available in her bookshop.
   d. Wanted to create a query based on a criteria.
2. Amit is new to the concepts of a database. He opened the LibreOffice Base in his laptop to create a table in a database. Help him understand the following concepts.
   a. What are the advantages of creating a table in a database?
   b. Why do we need a primary key in a table?
   c. How many ways are there to create a table in a database?
   d. What is the extension of a database created in an LibreOffice Base?
3. Ridhi wants to create multiple tables in a database and manage her data in her company. She wants to do a lot of other things using the tables. Help her to do the following:
   a. Name two different ways of creating a form in a table.
   b. How can she create a Relationship between two tables?
   c. Explain any two types of relationships.
   d. What are reports in a database?
   e. Name any one way of creating a report.

Assertion and Reasoning Questions:

Direction: Questions 4-5, consist of two statements – Assertion (A) and Reasoning (R). Answer these questions selecting the appropriate option given be-low:

a. Both A and R are true and R is the correct explanation of A.
b. Both A and R are true but R is not the correct explanation of A.
c. A is true but R is false.
d. A is false but R is true.

4. **Assertion (A):** A primary key uniquely identifies each record (row) in a table.

   Reasoning (R): Referential integrity is a fundamental rule in relational databases that ensures the consistency and validity of relationships between tables.

5. **Assertion (A):** Relational databases are the most widely used database model.

   Reasoning (R): Relational databases organise data into tables consisting of rows and columns, and use SQL for managing and querying data.

Statement Based Questions:

Two statements are given . Statement 1 and Statement 2 . Examine the statements and answer the question according to the instruction given below.

a. Statement 1 is TRUE , Statement 2 is TRUE
b. Statement 1 is FALSE , Statement 2 is False
c. Statement 1 is TRUE , Statement 2 is False
d. Statement 1 is FALSE , Statement 2 is TRUE

6. **Statement 1:** The VARCHAR data type can store a variable length of characters up to a specified limit.

   Statement 2: The CHAR data type is used to store variable length characters.

1. Create a database Examination in LibreOffice Base and perform the following operations:
   - Create a table Marks having the following structure:

Field Name	Data Type	Length
Stud_No	Integer	4
Stud_Name	Text	40
RollNo	Integer	5
Sub_1_Marks	Decimal	3,2
Sub_2_Marks	Decimal	3,2
Sub_3_Marks	Decimal	3,2

   - Add the following records:

Stud_No	Stud_Name	RollNo	Sub_1_Marks	Sub_2_Marks	Sub_3_Marks
D101	Amit Kumar	A2342	78	88	98
D102	Soniya Sharma	A2343	98	78	78
D103	Ankit Kaushal	A2344	99	89	94
D104	Anil Thapar	A2345	88	98	91
D105	Kusum Agarwal	A2346	89	92	88

   - Create a form to update the above records.
2. Create a database School and create a table Students in it. The structure of the Students table is as follows:

Field Name	Data Type	Length
RollNo	Integer	4
Name	Text	30
Class	Text	3
Section	Text	1

After creating the table, perform the following operations:
- Apply the primary key on the RollNo field.
- Create a query in Design view to display all the records from the table.
- Write a query in SQL View to display the total number of records in the table.
- Create a report for the Students table.

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