Class 10

LESSON PLAN

Computer Applications

1. Networking

Teaching Objectives

Students will learn about

- Internet
- Internet Terminology
- Internet Protocols
- Difference between POP3 and IMAP
- Remote Login Protocols
- Web Services
- History of Internet
- World Wide Web (WWW)
- E-Mail Protocols
- HTTP and HTTPS
- Services Available on the Internet
- Mobile Technologies

Teaching Plan

Number of Periods	
Theory	Practical
5	5

Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

Internet is an interconnected Wide Area Network (WAN) of millions of computers that are linked together around the world. With Internet we can share information in the form of data, graphics, sound, software, text, etc. instantly as and when required with a minimum overhead cost.

Internet maps its derivation back to 1969 when it evolved out of an experiment carried by the defence agency of United States.

Define the internet terminologies:

- Web servers
- Web page
- Blogs
- Web clients
- Web browser
- Newsgroups
- Website
- Web address
- e-mail

The 'World Wide Web' is a framework for accessing linked documents spread over millions of computing devices over the Internet.

TCP/IP stands for Transmission Control Protocol/Internet Protocol. It is a standard Internet communication protocol that allows computers to communicate over long distances. Transmission Control Protocol/ Internet Protocol, is the suite of two protocols i.e., TCP and IP, used to interconnect network devices on the Internet.

FTP stands for 'File Transfer Protocol'. It is a set of rules for transferring files between two computers on Internet. It is a commonly used protocol for exchanging files over any TCP/IP based network. The central computer i.e., FTP server helps the users to upload and download files.

E-mail Protocols are set of rules that help the email client to properly transmit the information to or from the mail server. Let's discuss different e-mail protocols like. SMTP, POP and IMAP.

Explain the difference between the following:

Basis for Comparison	POP3	IMAP
Read	To read the mail, it has to be downloaded first.	The mail content can be read before downloading.
Organize	The user cannot organize mails in the mailbox of the mail server.	The user can organize the mails on the server.
Modify	The user cannot create, delete or rename mailboxes on a mail server.	The user can create, delete or rename mailboxes on the mail server.
Content	A user cannot search the content of mail, prior to downloading.	A user can search the content of mail for specific string of character before downloading.

HTTP	HTTPS
The address bar URL begins with "http://"	The address bar URL starts with "https://"
It is unsecure.	It is secure mode for exchanging data.
There is no encryption of data.	Data is encrypted in HTTPS.
It does not require any certificate.	It needs SSL (Secure Socket Layer) certificate.

FTP	SFTP
File Transfer Protocol, often called 'Plain FTP'.	SSH File Transfer Protocol, often called 'Secure FTP'.
Clear-text password sent over the network.	Password and Data Transfer is encrypted.
Typically runs over TCP port 21.	Typically runs over TCP port 22.

A web service can be defined as a piece of software or application or cloud technology that is available online and provides standardized web protocols (HTTP or HTTPS) to communicate and exchange messages.

The communication through mobile cellular began during 1980. Since then mobile technology has undergone considerable changes and has resulted into portable mobile communication and smartphones that have become very popular in last few years.

Extension

Ask the students some oral questions based on this chapter.

Q. Explain the following:

a. Internet
b. History of Internet
c. Internet Terminology
d. World Wide Web (WWW)
e. Internet Protocols
f. E-Mail Protocols
g. Difference between POP3 and IMAP
h. HTTP and HTTPS
i. Remote Login Protocols
j. Services Available on the Internet
k. Web Services
l. Mobile Technologies

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 39 to 44 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

2. Introduction to HTML

Teaching Objectives

Students will learn about

- History of HTML
- Features of HTML
- Basic Terminologies
- Creating an HTML Document
- Attributes
- Comments
- Character Formatting Tags
-
 Tag
- Description List
- Evolution of HTML
- Prerequisites to Work with HTML
- Fundamental Structure of HTML Document
- Viewing the Web Page in Web Browser
- Presentation Tags
- <H1>...<H6> Heading Tags
- <P> Tag
- Lists in HTML
- Combining Tags

Teaching Plan

Number of Periods	
Theory	Practical
12	20

Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

HTML is a standardized system to describe the structure of text based information in a document by denoting certain text as heading, paragraphs, lists and so on and by supplementing the text with interactive forms, embedded images and other objects. Technically HTML is not a programming language.

Explain the features, evolution and basics of HTML to the students.

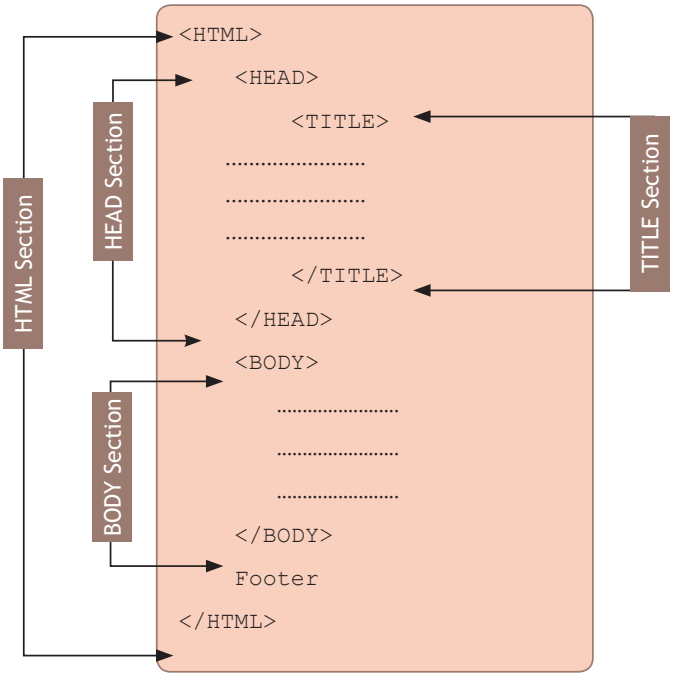
To work in HTML, the user needs:

- Text Editor
- Web Browser

Make them learn about some basic terms related to HTML. These are:

- Tag
- Element
- Attribute

HTML document consists of text that comprises the contents of the document and the tags that define the structure and appearance of the document. The basic structure of an HTML document can be classified into different elements or sections.



An HTML document can be created by using simple text editor like Notepad, KWrite or HTML editor like Front Page, etc. To view the content of the document, one can use a web browser like Google Chrome, Microsoft Edge, Mozilla, Firefox, Opera, etc.

Attributes refer to additional features that can be added with the tags, to apply or to change and enhance the appearance of different parts of a web page.

HTML provides various presentation tags that help in enhancing the appearance of the web page.

Comments are used to add remarks to the programs created in any language. The comments are not executed by the compilers or browsers of the programs but are displayed in the source programs as they are. They provide additional information about the program.

Heading tags are container tags. The heading tags (from<H1> to <H6>) are used to add headings in the HTML document. Headings are displayed in larger and bolder fonts, than the normal text size. Headings are also used to organize the contents of the text.

In HTML, there are many character formatting tags which are also called font-style tags. These tags help to change the appearance of text with their predefined effects.

There are two types of lists which can be displayed in an HTML document:

- Ordered or Numbered List
- Unordered or Unnumbered List

HTML supports a list style which is called definition list or description list where terms are listed along with their description like in a dictionary or encyclopaedia. The definition list is the ideal way to present a glossary, list of items, or other name/value list.

To achieve the desired effect or result as a whole, all the different tags which have been used can be combined.

Extension

Ask the students some oral questions based on this chapter.

Q. Write a note on:

a. History of HTML
b. Evolution of HTML
c. Features of HTML
d. Prerequisites to Work with HTML
e. Basic Terminologies
f. Fundamental Structure of HTML Document
g. Creating an HTML Document
h. Viewing the Web Page in Web Browser
i. Attributes
j. Presentation Tags
k. Comments
l. <H1>...<H6> Heading Tags
m. Character Formatting Tags
n. <P> Tag
o.
 Tag
p. Lists in HTML
q. Description List
r. Combining Tags

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 76 to 82 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

3. More About HTML

Teaching Objectives

Students will learn about

- <IMG> Tag
- <SUB> Tag
- <PRE> Tag
- Linking
- Embedding Multimedia Objects
- <SUP> Tag
- <BLOCKQUOTE> Tag
- <TABLE> Tag
- HTML Form

Teaching Plan

Number of Periods	
Theory	Practical
10	15

Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

The <IMG> (Image) tag is an empty tag. The attribute SRC (Source) is used with the IMG tag to specify the location and name of the image file.

<SUP> is a container tag. It is used to display the text in superscript form. The text enclosed within this tag is raised to the power form (exponential). This tag is helpful to write arithmetic and scientific notations.

<SUB> is a container tag. It is used to display the blocked text in subscript form. The enclosed text is displayed as the base of the normal text. This tag is generally used to write formula and chemical equations.

<BLOCKQUOTE> is a container tag. It contains block-level tags. This tag is used to display the text after leaving a space of two indents from its side margin. The

<Table> tag is used to create table in a web page. It is used within the body of the HTML document.

To create a table in HTML (web pages), it is necessary to create rows and columns. The TR (Table Row) tag and TD (Table Data) tag are used to create grid of rows and enter data in the grid.

TH tag is used to denote a cell as heading cell.

The most useful feature of HTML is to link the text or image or a part of the same document to another document. HTML supports two kinds of linking: External Linking and Internal linking.

An HTML form is an interface of a web page that facilitates the user to enter data (such as name, e-mail address, password, phone number, etc.) that is to be sent to the server for further processing.

You can add audio and video in your web page by using the <AUDIO> and <VIDEO> tags.

Extension

Ask the students some oral questions based on this chapter.

Q. Explain the following:

a. <IMG> Tag
b <SUP> Tag
c. <SUB> Tag
d. <BLOCKQUOTE> Tag
e. <PRE> Tag
f. <TABLE> Tag
g. Linking
h. HTML Form
i. Embedding Multimedia Objects

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 107 to 111 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

4. Cascading Style Sheets

Teaching Objectives

Students will learn about

- ☞ Link Style Sheet
- ☞ CSS Border
- ☞ CSS Height And Width
- ☞ CSS Font
- ☞ CSS Float
- ☞ Background Color
- ☞ CSS Margins
- ☞ CSS Outline
- ☞ Aligning Text

Teaching Plan

Number of Periods	
Theory	Practical
8	15

Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

'Cascading Style Sheet' is commonly referred as CSS. CSS is a simple design language which enables to simplify the process of making web pages.

It handles and describes how an HTML web page will be presented on a web browser. It helps to save lot of time as one design layout can be used to make more number of web pages.

The Background Color property of style sheet is used to change the background colour of an element.

The CSS border properties enable to specify the style, width and colour of a border.

CSS 'margin' properties enable to create space around an HTML element, outside any border. It is also possible to use negative values to overlap the content.

The height and width properties enable to set the height and width of an element. It is also used to set the height and width of the area inside the border, margin, etc. of the element.

An outline is a line that is drawn around elements, to make the element "stand out".

CSS font property is used to define the font, size and the style of the text. Some of the commonly used font properties are font-family, font-style, font-size, etc.

The 'text-align' property is used to align the text in desired position. Left, Right, Center, Justify are the types of available text alignment.

Extension

Ask the students some oral questions based on this chapter.

Q. Write a short note on the following:

a. Link Style Sheet
b. Background Color
c. CSS Border
d. CSS Margins
e. CSS Height And Width
f. CSS Outline
g. CSS Font
h. Aligning Text
i. CSS Float

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 126 to 131 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

5. Cyber Ethics

Teaching Objectives

Students will learn about

- Netiquettes
- Intellectual Property Right
- Digital Property Right
- Digital Divide
- Software License
- Plagiarism
- Freedom of Information
- E-Commerce

Teaching Plan

Number of Periods	
Theory	Practical
5	10

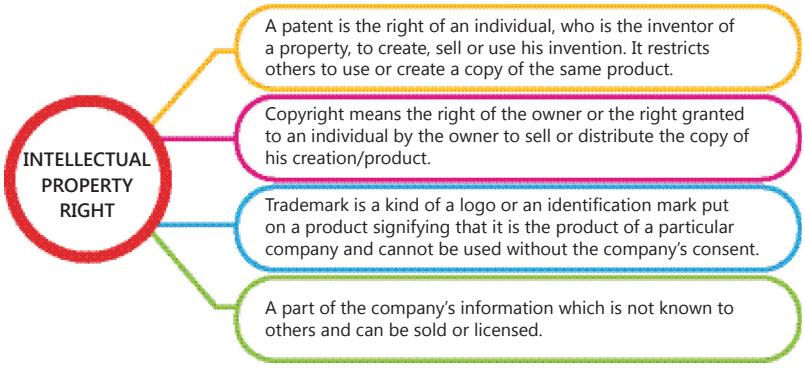
Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

Netiquette (net + etiquette) can be defined as the behaviour or informal guidelines that are followed by the users of the Internet. It includes common sense, courtesy and proper dialects while using tools of computer technology and thus signifies the culture amount Internet users.

E-mail netiquettes are the basic etiquettes and courtesy that should be followed while sending e-mails.

Software License is the authorization to use a software. Most of the software are licensed rather than being sold, which means buyers are never the actual owners of the software, although they may be able to use it without any time limit or may become owner of a copy of such software.

'Intellectual Property Right' is the legal right that covers the privileges of an individual who has created or invented something with his own intellectual ability or creativity and is the owner of his work.



Plagiarism is the act of copying someone else's work and publishing and pretending as if it is one's own work. This can include copying of texts, media and even ideas.

'Digital Property Right' is the legal right that covers the privileges of an individual for the security of his digital property. Digital property includes e-mails, word processing documents, spreadsheets, pictures, audio files, movies, Internet accounts credentials and other rights in the digital world, including contractual rights, intellectual property rights, etc.

Freedom of Information is the right to obtain information from any public authority by making a request in writing or through electronic means, to the concerned Information Officer or department specifying the particulars of the information sought by him.

Digital divide is a term that refers to the gap between those who have access to the resources of modern information and communications technology, and those that have restricted access. This technology can include data, resources of mobile technology, Internet, IT and ITES, etc.

E-commerce, also known as electronic commerce or Internet commerce, refers to the buying or selling of goods or services over the Internet.

Extension

Ask the students some oral questions based on this chapter.

Q. Define the following:

a. Netiquettes
b. Software License
c. Intellectual Property Right
d. Plagiarism
e. Digital Property Right
f. Freedom of Information
g. Digital Divide
h. E-Commerce

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 141 to 145 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

6. Scratch

Teaching Objectives

Students will learn about

- Starting with Scratch
- Selecting a Sprite
- Changing the Sprite Name
- Motion Block
- Direction
- Data
- Events Blocks
- Components of Scratch Screen
- Drawing a Sprite
- Animation in Scratch
- Coordinates
- Tempo
- Control Blocks
- Sensing Blocks

Teaching Plan

Number of Periods	
Theory	Practical
15	60

Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

Scratch contains a library of sprites which can be used as an object in the project. Scratch also allows you to draw a sprite of your own choice.

Animation is a feature in computer technology that helps to bring life to characters on screen. The word 'Animation' is derived from the Latin word 'Anim' that means 'soul'.

In Scratch, you can animate the sprite using the various blocks available. These blocks are categorised according to the functions they can perform.

Block Name	Shape	Function
Hat Block	 *Rounded top and bumped bottom*	This block helps to begin a script. It is shaped in such a way that we can place blocks below it.
Stack Block	 *Notch at the top and bumped bottom*	This block helps to place the other blocks above and below it.
Boolean Block	 *Hexagonal shaped*	This block is the condition block which has either of the two values; 'True' of 'False', so it helps to take a decision.
Reporter Block	 *Rounded edges*	This block is the value block that can hold numbers and strings.
C-Block	 *C shaped*	This block loops the other blocks within it. It is also called as wrap block. This block is also used to repeat an action.
Cap Block	 *Notch at the top and flat bottom*	This block stops functioning script. It is shaped in such a way that no other block can be placed below it.

Coordinates are numbers that represent the exact location in the form of (X,Y) coordinates. The X-coordinate (also called X position) is a number that represents how far left or right a sprite is on the Stage.

The words like up or right are perfectly understood as directions by humans beings. But the sprite needs a number to indicate the exact direction. The direction numbers are between −180 and 180 degrees.

Pointing at 0 degrees is facing up with respect to the sprite. Pointing at 90 degrees is facing to the right with respect to sprite. Also, notice that −180 and 180 degrees point in the same direction: down.

The speed or pace at which a sound or music is being played is known as its 'Tempo'. Tempo is measured in bpm (beats per minute).

In Scratch, a variable is a placeholder to store and read values from. Its stored value can change during the execution of the program. In Scratch, variables are represented with blocks shaped like elongated circles, uniquely labeled by the user. Variables, generally speaking, can be local or global.

In Scratch, a local variable can be used by just one sprite; a global variable can be used by all of your sprites.

'Conditional block', and 'Loop block' are the main programming blocks of 'Control' block.

Sensing blocks is one of the eight categories of blocks. They are in light blue colour and are used to detect different factors or situations of a project. There are different types of Sensing blocks such as Stack blocks, Boolean blocks, Reporter blocks, etc. One of the popular blocks of 'Sensing' is 'Ask and Wait'.

Extension

Ask the students some oral questions based on this chapter.

Q. Explain the following:

a. Starting with Scratch
b. Components of Scratch Screen
c. Selecting a Sprite
d. Drawing a Sprite
e. Changing the Sprite Name
f. Animation in Scratch
g. Motion Block
h. Coordinates
i. Direction
j. Tempo
k. Data
l. Control Blocks
m. Events Blocks
n. Sensing Blocks

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 167 to 172 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

7. Programming in Python

Teaching Objectives

Students will learn about

- Working in Python
- Tokens
- Data Type
- Input Statement
- Character Set
- Variables
- General Layout of Python Programs

Teaching Plan

Number of Periods	
Theory	Practical
5	20

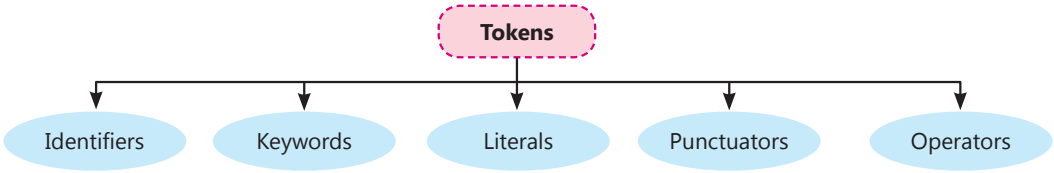
Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

'Interactive Mode' allows us to type only a single command at the command prompt '>>>'. Python interprets the given command and displays the output when the 'Enter' key is pressed.

In the script mode, we type a program in more than one line and then the interpreter executes the complete program file.

Character set in Python consist of valid characters such as letters, digits or special characters that are recognized by the library of Python language.

The smallest individual unit in a program is referred as 'Token'. Tokens are also known as Lexical Elements or Lexical Units. It can be categorised as:



A variable is the data or value which can change during the execution of a program. It is a name given to a location in memory in which the value is stored during the execution of a program.

Data types are the kind of data that is to be stored in the variables which is being used while writing a program. Python imagines the data type of a variable during the execution of program by their syntax.

Input statement is used to accept input value from the user during runtime.

Syntax: variable_name = data_type(input ('message to be displayed'))

Program: num = int(input ('Enter value of num='))

The above statement accepts the value for the variable num from the user and converts the inputted string to an integer type.

Extension

Ask the students some oral questions based on this chapter.

Q. Write a short note on the following:

a. Working in Python
b. Character Set
c. Tokens
d. Variables
e. Data Type
f. General Layout of Python Programs
g. Input Statement

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 189 to 193 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

8. Decision Making in Python

Teaching Objectives

Students will learn about

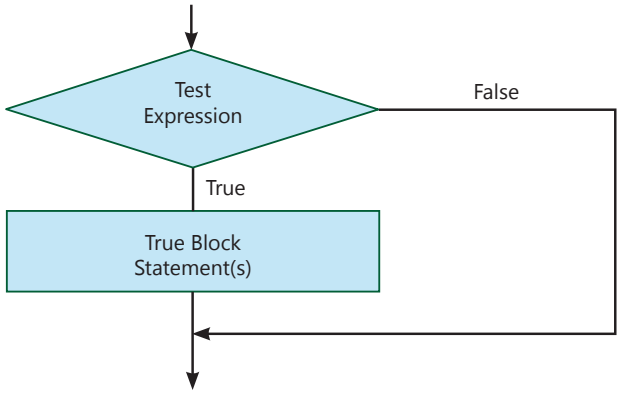
- ☞ The 'if' Statement
- ☞ The 'if...elif...else' Statement
- ☞ The 'if...else' Statement
- ☞ Decision Making with Logical Operators

Teaching Plan

Number of Periods	
Theory	Practical
5	20

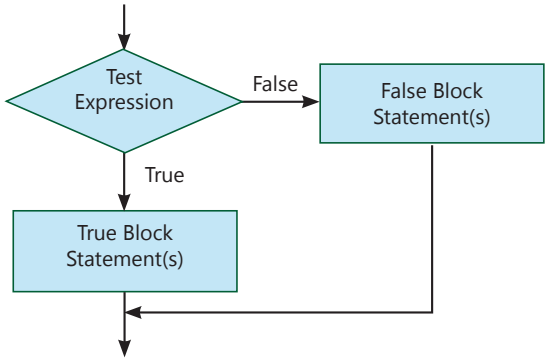
Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

'if' statement is a decision making statement. When the output of any expression is true (in Yes), then a particular course of action or the statement has to be followed, otherwise the course of action or the statement is executed.



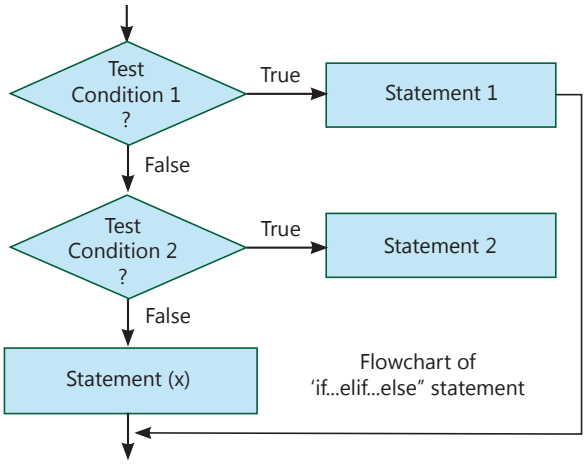
Flowchart of 'if' statement

'if...else' statement is a decision-making statement. When the output of an expression is 'True' (in Yes), then it follows one direction of execution of statement but if it is 'False' (in No), then it follows the other direction of execution.



Flowchart of 'if...else' statement

In a situation, when a series of decision making statements are involved, we may have to use more than one if....else statement in nested form.



Flowchart of 'if...elif...else" statement

In a situation, when multiple conditions are to be combined while making a decision, logical operators can be used.

Syntax: if((condition 1)(and/or)(condition 2)):

statement1;

else:

statement1:

Extension

Ask the students some oral questions based on this chapter.

Q. Explain the following:

a. The 'if' Statement
b. The 'if...else' Statement
c. The 'if...elif...else' Statement
d. Decision Making with Logical Operators

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 201 to 206 in the main course book as **Solved Exercise** and **Unsolved Exercise**.

9. Looping in Python

Teaching Objectives

Students will learn about

- ☞ Components of a Loop
- ☞ Nested Loop
- ☞ The 'break' Statement
- ☞ The 'while' Loop
- ☞ The 'for' Loop
- ☞ The 'continue' Statement

Teaching Plan

Number of Periods	
Theory	Practical
5	20

Explain the following to the students in detail with proper examples, functions, purpose and real-life routine solutions:

A "program loop" consists of two segments. One known as the body of the loop and the other known as the control statement. The control statement tests certain conditions and if the condition is true, then it executes the statements present in the body of the loop.

Explain the following are the components of a Loop:

Initialization

Test Condition (Expression)

Increment/Decrement (Step Value)

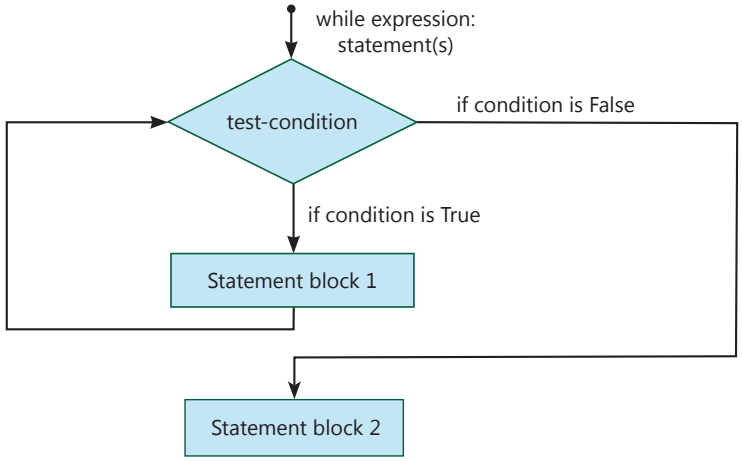
Body of the loop

The 'while' loop is an entry-controlled loop statement. 'While' loop is used to execute a block of statements repeatedly until a given condition is satisfied.

Syntax: while condition: #Condition is Boolean expression returning True or False

Statements block 1 #For condition evaluates to True

Statements block 2 #For condition evaluates to False



Python programming language allows to use one loop inside another loop. Block of statements belonging to while statement can have another while statement i.e., a while can contain another while.

Syntax: while expression:

while expression:

statement(s)

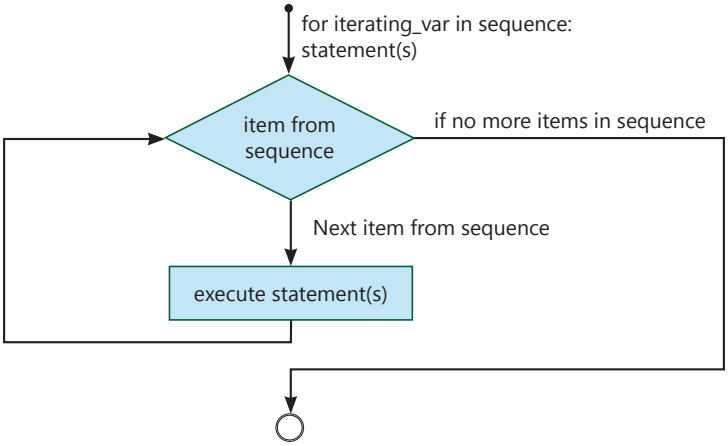
statement(s)

Nested loop can have any type of loop statement inside other loop statement. For example: 'for' loop can be inside a 'while' loop or vice versa.

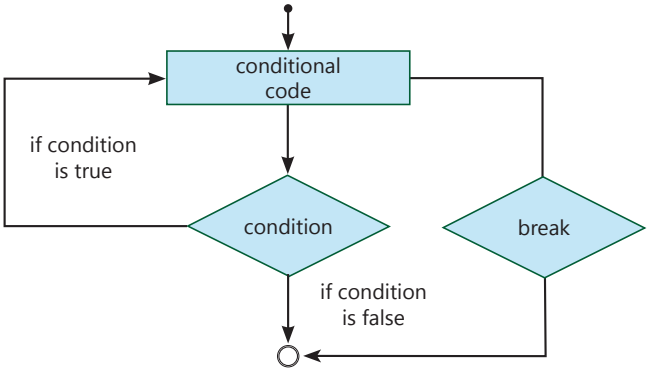
For loop has the ability to iterate over the items of any sequence, such as a list or a string.

Syntax: for iterating_var/target_list in sequence/expression_list:

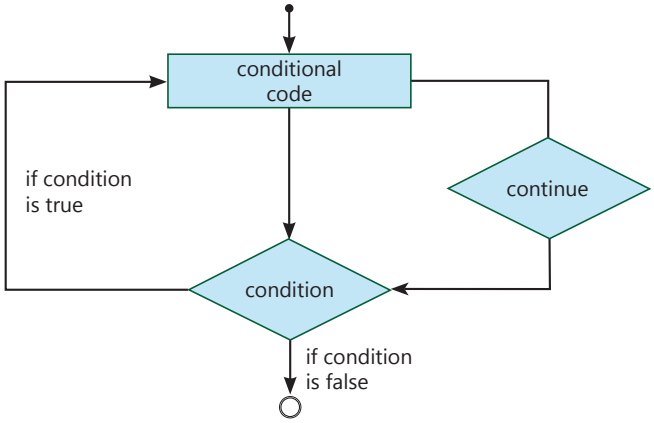
Statement(s)



Break can be used to unconditionally jump out of the loop. It terminates the execution of the loop. Break can be used in while loop and for loop. Break is mostly required, when because of some condition, we need to exit from a loop.



Continue statement is used to tell Python to skip the rest of the statements of the current loop/ iteration and to move to next iteration of the loop. It returns the control to the beginning of the loop. This can also be used with both while and for loops.



Extension

Ask the students some oral questions based on this chapter.

Q. Define the following:

a. Components of a Loop
b. The 'while' Loop
c. Nested Loop
d. The 'for' Loop
e. The 'break' Statement
f. The 'continue' Statement

Evaluation

After explaining the chapter, let the students do the exercises given on Pages 214 to 219 in the main course book as **Solved Exercise** and **Unsolved Exercise**.