Chapter 1

AI Domains and Applications

CT & AI

CODE DECODE

A. 1. a) 2. a) 3. b) 4. a) 5. d)

B. 1. Classification 2. Similarities 3. Predictions 4. Web
5. Amazon Alexa

C. 1. T 2. F 3. T 4. T 5. T

D. 1. Optical Character Recognition (OCR)
2. Classification
3. Sentiment analysis
4. Object tracking
5. Spatial dataset

E. 1. Clustering is a method in AI where data is grouped together based on similarities. Unlike classification, clustering doesn't need labels to start with.

2. The domains of AI refer to the main areas or branches where AI is used to mimic or enhance human intelligence. Each domain focuses on a particular type of task that the human brain performs, such as language recognition, reasoning, learning, pattern recognition or understanding images. Mainly, there are three domains of AI:
   - Computer vision
   - Natural Language Processing (NLP)
   - Data science

3. The process of computer vision typically involves the following steps:

   Step 1 Image acquisition: The computer captures an image using a camera, sensor or scanner, similar to how we take photos or scan documents.

   Step 2 Pre-processing: The captured image is pre-processed by cleaning and enhancing it, which includes removing noise, adjusting brightness and improving image quality for better analysis.

   Step 3 Feature extraction: The system extracts important features from the image, such as edges, shapes, colours and textures, to help in understanding the visual content.

Step 4 Object categorisation: The system categorises the detected features into general classes, such as identifying whether the object belongs to categories like a car, person or animal.

Step 5 Object identification: The system identifies the exact object by matching it with stored data or patterns to determine what the object specifically is.

Step 6 Object tracking: The system tracks the movement of the identified object across multiple frames or images, such as following a moving car or a walking person in a video.

4. Data science involves collecting, analysing and interpreting large amounts of data to help machines recognise patterns and make decisions or predictions. It uses fields like mathematics, statistics and computer science to solve real-world problems.
5. NLP is applied in various ways to enable computers to understand and process human language. Some common types of NLP technologies are:
   - Sentiment analysis: Sentiment analysis is used to identify whether a given text expresses a positive, negative or neutral opinion.
   - Semantic search: Semantic search focuses on understanding the intent behind a query and improves search results by offering relevant predictions.
   - Optical Character Recognition (OCR): OCR converts handwritten or printed text into machine-readable format.

THINK & APPLY

Do it yourself.