

Assignment - 01

1. Define Artificial intelligence (AI) & provide example of its applications.

→ Artificial intelligence, or AI is the field of Computer science that focuses on creating intelligent machines.

→ These machines are designed to perform tasks that would typically require human intelligence, such as problem-solving, learning & decision making.

→ AI technology has applications in various areas, like voice assistants, self-driving cars & even social media algorithms.

Examples of its applications.

1) Virtual Assistants.

AI powers voice-activated assistants like Siri, Alexa, & Google Assistant help us with tasks, answer questions & provide information.

2) Autonomous vehicles.

AI enables self-driving cars to perceive their surroundings, make decisions & navigate safely on the road.

3) Health Care

AI is used in medical imaging to assist in the diagnosis of diseases, drug discovery & personalized medicine.

4) Gaming.

AI is used to create intelligent virtual opponents in games & to improve game graphics & physics simulations.

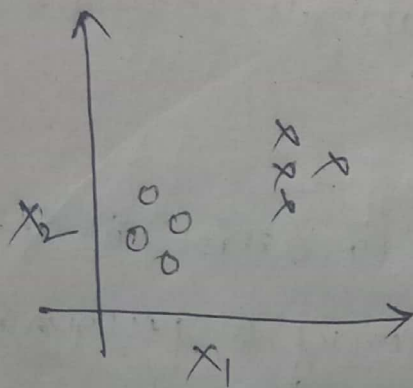
5) Smart Home devices -

AI powers devices like smart speakers, thermostats, & security systems making our homes more efficient & responsive

Q) Differentiate between supervised & unsupervised learning techniques in ML.

Supervised

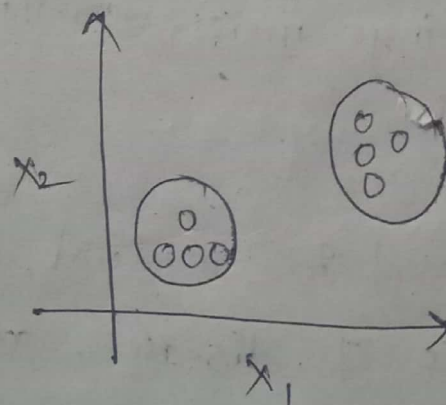
- Input data is labelled
- ⇒ uses training dataset
- ⇒ data is classified based on training dataset
- ⇒ Used for prediction
- ⇒ Divided into two types
regression & classification
- Known number of classes



* use offline analysis of data

Unsupervised

- ⇒ Input data is unlabelled
- ⇒ uses just input dataset
- ⇒ Uses properties of gives data to classify it
- ⇒ Used for Analysis
- ⇒ Divided into two types
Clustering & Association
- ⇒ Unknown number of classes.



* use real time analysis of data

3) What is python? Discuss its main features & advantages.

Python is a programming language that's super popular for its simplicity & versatility. It's used for web development, data analysis, AI & more.

(1) Easy to Read & Write

Python has a clean & simple syntax, making it easy to understand & write code.

2) Versatile & Powerful Python can be used for various purposes like web development, data analysis, scientific computing, machine learning & more.

3) Large Standard Library

Python comes with a vast standard library that provides ready-to-use modules for different tasks, saving you time & effort.

4) Cross-platform Compatibility

Python programs can run on different operating systems like Windows, macOS, & Linux without any modifications.

5) Integration Capabilities

Python can easily integrate with other languages like C, C++, & Java, allowing you to leverage existing code & libraries.

Q) What are the advantages of using python as a program language to AI & ML?

Python is widely used in the field of AI & ML for several reasons.

1. Extensive libraries

Python offers a rich eco-system of libraries such as tensorflow, pytorch & scikit-learn, which provide powerful tools & pre-built functions for AI & ML tasks.

2. Easy to read & write

Python clean & readable syntax allows developers to express AI & ML concepts in a straight forward manner. This makes it easier to prototype, experiment & collaborate on project.

3. Large Community & Support

Python has a vibrant community of developers who actively contribute to AI & ML projects. This means you can find ample resources, tutorials, & forums to seek help & stay updated with the latest advancements.

4) Integration Capabilities

Python seamlessly integrates with other languages like C & C++ allowing you to combine the efficiency of low-level languages with the simplicity & flexibility of python.

5) Data Handling & visualization

Python provides excellent libraries like pandas & matplotlib for data manipulation analysis & visualization.

Visualization these tools enable efficient data preprocessing & exploration, essential steps in AI & ML workflows.

5) Discuss the importance of indentation in python code.

Indentation plays a crucial role in python code. In python, indentation is used to define the structure & hierarchy of code blocks, such as loops, conditional & functions.

```
x=10
if x==10:
    print('x is equal to 10')
```

1) Readability: Indentation enhances the readability of python code. By visually representing the code's structure, indentation makes it easier for developers to understand flow & logic of the program.

2) Code blocks: In python, code blocks are defined by their indentation level. Indentation determines which lines of code belong to a specific block.

3) Consistency: python enforces consistent indentation as part of its syntax. By requiring a consistent indentation style, python promotes code uniformity & readability across different projects & teams.

4) Debugging: Indentation errors can lead to syntax errors or logical bugs in python code. By paying attention to proper indentation, you

Can catch & resolve these errors early, making the debugging process smoother.

6) Define variable in python provide ex of valid variable names.

⇒ variable used to store data values we should not use keywords we should not use special characters.

City-name = 'Waiyangal'

variable assigning

```
x = 5  
y = "hey vec"
```

```
z = 3.14
```

```
print(x)
```

```
print(x)
```

```
print(y)
```

```
3.14
```

```
5
```

```
hey vec
```

7) Explain the difference b/w a keyword & an identifier in python.

Keywords

⇒ Keywords are reserved words with special meaning

⇒ Keywords do not have symbols

Identifiers

Identifiers is a unique name given to the class function array & so on

⇒ Identifiers can have symbols

→ Specify the type/kind of entity

→ Identify the name of a particular entity

→ Keywords are not further classified

→ Identifiers are classified into 'external name' and 'internal name'.

8) List the basic data types available in python

Datatypes:-

Integer (int):-

Represents whole numbers, both +ve & -ve for

Ex:- 5, -10.0.

float:-

Represents decimal numbers

Ex:- 3.14, -2, 5.0, 0.

String (str):-

Represents a sequence of character enclosed

in single quotes (' ') or double quotes (" ")

Ex:- "Hello, world!", 'python', '123'.

Boolean (bool):-

Represents either true (or) false this data type is useful for logical operations & conditional

statements

List:- Represents an ordered collection of elements enclosed in square brackets ([]).

Ex:- [1, 2, 3], ['Apple', 'banana', 'cherry'].

9) Describe the syntax for an if statement in Python

Executes one block of code if a condition is true & another block if it's false

If condition:

(1) the keyword 'if' is followed by a condition, which is an expression that evaluates to either

true or false

(2) After the condition, there is a colon (':') to indicate the start of the code block that will be executed if the condition is true.

(3) The code block is indented & contains one or more statements that will be executed if the condition is true.

Ex: $x = 22$

if $x > 50$:

print("x is greater than 50")

else:

print("x is not greater than 50")

Op: x is not greater than 50

10) Explain the purpose of the elif statement in Python.

→ The 'elif' statement in Python stands for "else if". It is used when you want to check multiple conditions in a sequence.

Syntax

if condition 1:-

Code block to be executed if condition 1 is true

Statement 1

Statement 2

elif condition 2:-

Code block to be executed if condition 1 is false & condition 2 is true

Statement 3

Statement 4

else

code block to be executed if all conditions are false

Statement 5

Statement 6

* The 'elif' statement allows you to check additional conditions after the initial 'if' statement

* If the first condition is false, it moves on to the next 'elif' statement & checks its condition

* If that condition is true, the corresponding block is executed

* This process continues until either a condition is true or there are no more 'elif' statements.

if none of the conditions are true the code block within the 'else' statement is executed.

* Using 'elif' allows you to handle multiple scenarios & perform different actions based on the specific condition that evaluates to true.