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 vechiles.

AI enables self-driving cars to perceive their surroundings makes 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:

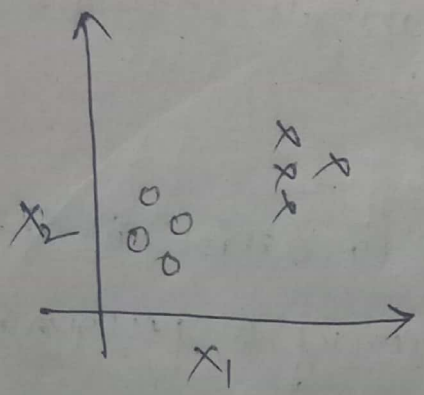
AI is used to create intelligent virtual opponents in games & to improve game graphics & physics simulations.

5) Smart Home devices:-

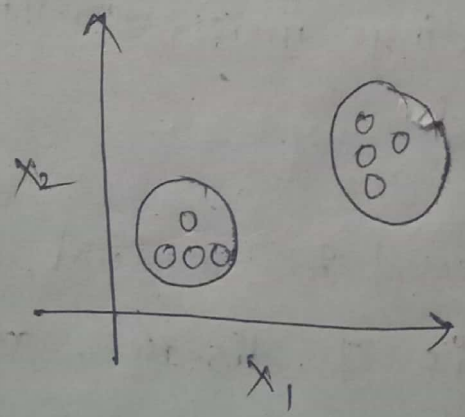
→ AI powers devices like smart speakers, thermostats, & security systems making our homes more efficient & responsive

6) Differentiate between Supervised & Unsupervised learning techniques in ML.

Supervised	Unsupervised
→ Input data is labelled	→ Input data in unlabelled
→ uses training dataset	→ uses just input dataset
→ data is classified based on training dataset	→ uses properties of given data to classify it
→ used for prediction	→ used for Analysis
→ Divided into two types regression & classification	→ Divided into two types Clustering & Association
→ Known number of classes	→ Unknown number of classes.



→ use offline analysis of data



→ 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 purpose like web development, data analysis, scientific computing machine learning & more

3) Large Standard libraries:

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.

4) 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 make 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, & forms to seek help & stay updated with the latest advancements.

4) Integration Capabilities

Python seamlessely integrals 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 & el

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, conditionals & functions

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

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

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

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

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

can catch & resolve these errors easily, 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 = 'Warangal'

variable assigning

```
x=5
y="hey vec"
z=3.14
print(z)
print(x)
print(y)
```

3.14
5
hey vec

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

Keywords	Identifiers
⇒ Keywords are reserved words with special meaning	Identifiers is a unique name given to the class function array & so on
→ Keywords do not have symbols	→ 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 characters 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 brakets ([]).

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")

O/p: 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 intial '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 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.