# 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 & ~~des~~ 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 and provide information

2) Autonomous Vehicles
AI enables self-driving cars to perceive their surroundings makes decisions and navigate safely on the road.

3) Health care
AI is used in medical imaging to assist in the diagnosis of diseases, drug discovery & personal-ized medicine.

4) Gaming

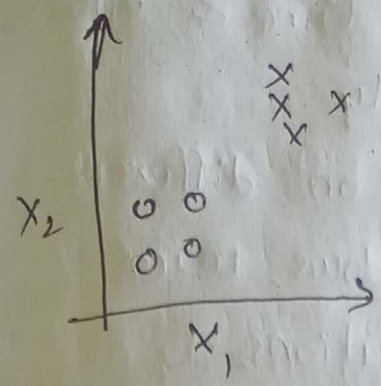
AI is used to create intelligent virtual opponents in games & to improve game graphics & physics simulations.

5) smart Home devices:

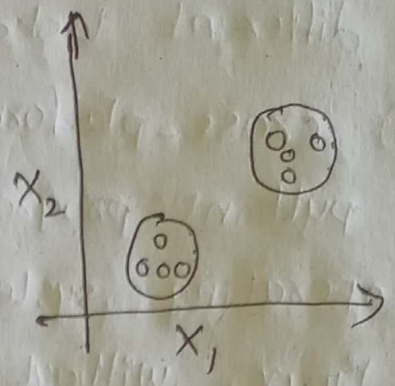
AI powers devices like smart speakers, thermostats & security systems making our home more efficient & responsive.

(2) Differentiate between supervised & unsupervised learning techniques in ML

| supervised | unsupervised |
|---|---|
| * Input data is labelled | * Input data is unlabell -ed. |
| * uses Training dataset | * uses Just input data set. |
| * data is classified based on training dataset | * uses properties of gives data to classify it |
| * used for prediction | * used for Analysis |
| * Divided into two types regression & classificat -ion | * 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 and advantages

python is a programming language that's super popular for its simplicity & versatility. It's used for web development data Analysis and & 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 library:

Python comes with a vast standard library that provide 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 programming language to AI & ML?

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

1. extensive libraries

python offers a rich ecosystem of libraries such as tensorflow, pytorch & sciket-learn, which provide powerful tool & 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 protype, experiment & collaborate on project.

3. Large communication system & Task

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 & story 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 & ~~visu~~ visualization.

python provides excellent libraries like pandas & matpotlib for data manipulation analysis & visualization these tools enable efficient data preprocessing & exploration, ~~ess~~ 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 :-
Identation 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 identif indentation level, Indentation determine -s 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 differe -nt projects & teams.

4) debugging :-
Indentation errors can lead to syntax errors to logical bugs in python code.
By playing attention to proper indentation

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

⑥ Define variable in python, provide example 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 between a keyword & 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 datatypes 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

string (str) :

Represents a sequence of character enclosed in a 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

and 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 gr~~

ex:

```
x = 22
if x>50:
    print("x is greater than 50")
else:
    printf"x is not greater than
        50").
```

o/p : x is not greater than 50

(b) Explain the purpose of the else if 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:
# codeblock to be executed if condition
    1 is true

    statement 1
    statement 2
    - - - - -
    - - - - -
elif condition 2:
# code block to be executed if condition1
  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 correspond -ing code block is executed.
* This process continuous until either a condition is true or there are no more 'elif' statements, if ~~name~~ none of the conditions are true the code block within the 'else' statement is executed.
* Using 'elif' allows you to handle multiple scenario & perform different actions based on the specific condition that evaluates to true.