Assignment - 1

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 ~~Platform~~ Problem solving learning and decision Making.

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

Examples of its applications.

1. Virtual Assistants.

AI Powers voice-activated assistants like Siri, Alexa, & Google Assistant help as with tasks, answers 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 discover & personalized medicine.

4. Gaming

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

5. smart home devices.

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

2) Differentiate between supervised and unsupervised learning techniques in ML

supervised	unsupervised.
* supervised learning is to learn a mapping function from input features to output labels	* unsupervised learning aim to discover hidden patterns or structures within the data without explicit guidance
* uses training dataset	* uses joinput 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	* divided into two types
Regression & classification	clustering & Association.
* known no of classes	* unknown no of classes
* use offline analysis of data	* use real time Analysis of data.

3. What is Python? Discuss its main features and Advantages?

A:- Python is a high level, interpreted Programming language known for its simplicity and readability

* Its main features includes

1. Readable and simple syntax.

Python emphasizes readability and uses English keywords frequently, making it easy to easy to understand and write code

2. Interpreted and Dynamic.

Python code is executed line by line allowing for rapid development and debugging. It's dynamically typed, meaning you don't need to declare variables explicitly.

3. Platform independent.

Python code can run on various operating systems like windows, macos and linux without Modification.

4. Integration capability.

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

Advantages of Python.

1. Productivity.
2. Flexibility.
3. Community and ecosystem.
4. Scalability
5. Interoperability

4. What are the advantages of using Python as a Programming language for AI and ML?

A:- Python is favoured for AI and ML for several reasons.

1. Ease of learning and use.

Python's syntax is easy to understand and read Making it accessible for beginners and experienced developers alike.

2. large ecosystem

Python has a vast ecosystem of libraries and frameworks specifically designed for AI and ML such as Tensorflow, PyTorch and scikit learn.

3. Community Support

There's a large and active community of developers contributing to Python's AI and ML libraries, providing support, tutorials and resources.

4. Flexibility.

Python is a versatile language that can be used for a wide range of tasks beyond AI and ML, such as web development, scripting and automation.

5. Performance

While Python may not be as fast as lower-level languages like C or C++, its performance can be optimized using libraries like numpy and cython.

5) Discuss the importance of indentation in Python code.

A:- Indentation in Python code plays a fundamental role in maintaining readability, classify and consistency within the codebase.

* Importance extends beyond mere stylistic preference as it directly influences the structure, logic and functionality of Python Programs.

* Here are several key aspects highlighting the significance of indentation in Python.

1. Readability:

Python emphasizes readability and clean code and indentation significantly contributes to achieving this goals.

2. Code structure:

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 & team's

4. Debugging.

Profesly indented code is easier to debug when encountering an error, developers can quickly pinpoint the location of the issue based on the indentation level.

6. Define a variable in Python. Provide examples of valid variable names.

A:- In Python, Variable is a name that refers a value stored in memory A variable can be define by assigning a value to it using the equal sign (=)

Eg:- Variable = name = value

* Here are examples of valid variable names in Python.

Ex:- ax = 25

name = "John"

Salary = 2018 = 500.00

is-student = True

* valid variable names can consist of letters (both uppercase and lowercase), digits and underscores (_). but they must start with a letter or an underscore

* Additionally, variable names are case-sensitive, meaning "age" and "Age" are treated as different variables

7. Explain the difference between keyword and an identifier in Python.

Ans:-

Keyword	Identifiers
* keywords are reserved words with specifical meaning	* Identifier is a unique name given to the class function arrays ID on
* keywords do not have symbol	* Identifiers can have symbles
* Specify the type/kind of entity	* Identify the name of a Particular entity.
* keywords are not further classified.	* Identifiers are classified into "external name" or "internal name"

8. list the basic data types available in Python.

A:- Integer (int)

Represents whole numbers both positive & negative for example: 5, -10, 0.

Float:

Represents decimal numbers

Ex:- 3.14, 5.66

String (str):

Represents a sequence of characters enclosed in single quotes (' ') or double quotes (" ")

Eg:- 'Hello', "Python".

-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']

9) Describe the syntax for an if statement in Python

A:- In Python, the syntax for an if statement

```
if condition:
    # code block to execute if the condition
      is true.
```

You can also include optional 'elif' (else if) and 'else' classes.

if condition 1:
# code block to be execute if condition1 is true
else:
# code block to be execute if none of the
conditions are True.
each condition is followed by (:) and the code block associated with each condition is indented

10. explain the Purpose of the dif statement in Python
A:- The 'dif' statement in Python stands for "else if" It's used in conditional statements to check for multiple conditions after an initial 'if' statement.
* If the condition in 'if' statement is False, Python checks the conditions in subsequent 'elif' statements until one is True or it reaches an initial 'if' statement.
* It allows for branching logic, enabling the program to execute different code blocks based on different conditions.

```
if condition1:
    # code block to be executed
        if condition1 is true
elif condition2:
    # code block to be executed
        if condition2 is true
else
    # code block to be executed if
        all conditions are false.
```