

## 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 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 Assistance

AI powers voice-activated assistants like Siri.

Alexa & Google Assistant help us with tasks, answers questions & provide information.

### 2) Autonomous vehicles.

AI enables self-driving cars to perform and 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 different diseases, discover and personalise medicine.

### 4. Gaming

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

### 5. Smart Home devices.

AI powers devices like smart speakers, searching systems making our homes more efficient & responsive.

## 2) Differentiate between supervised and unsupervised learning techniques in ML.

#### Supervised

\* Supervised learning is to learn a mapping function from input features to output labels.

\* uses training dataset

\* data is classified based on training dataset

#### Unsupervised

\* unsupervised learning is to discover hidden patterns or structures within the data without explicit gestures

\* uses unlabeled databases

\* uses properties of given data to classify it



- \* used for prediction
- \* used for analysis
- \* Divided into two types:
  - Regression & classification
  - clustering and 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 as its simplicity and readability.

\* Its main features includes

1. Readable and simple syntax

python emphasises 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, its dynamic 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 other 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 is a large and active community of developers contributing to python's AI and ML libraries, providing support, tutorials, and resource.

### 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 python

### 5) Discuss the importance of indentation in python code.

A1- Indentation in python code plays a fundamental role in maintaining readability, clarity 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 emphasises readability and clean code and indentation significantly contributes to achieving this goal.

## 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 & teams.

## 4. Debugging.

properly indented code is easier to debug when encoding 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, variables 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 = value

∴ there are examples of valid variable names in python.

Ex 1:- age = 25

name = "John"

Salary = 2624 = 500.00

is - student = True.

\* valid variables names can consist of letters (both upper case 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.

\* **Keyword**

\* Keywords are reserved words with specified meaning.

\* Keywords do not have symbols

\* Specify the type / kind of entity

\* Keywords are not further classified

**Identifiers**

\* Identifier is a unique name given to the class function array, so on

\* Identifiers can have symbols.

8. list the basic data types available in python

A. Integers (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 is condition.

# code block to execute if the condition is true.



if condition 1 :

# code block to be execute if conditions is true  
else :

# code block to be execute if condition 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 elif statement in python.

Ans: The 'elif' statement in python stands for "else if".

It is 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 'else' statement.

\* It allows for branching logic, enabling the program  
to execute different code blocks based on different  
conditions.

if condition 1 :

# code block to be executed  
if condition 1 is true

elif condition 2 :

# code block to be executed  
if condition 2 is true

else

# code block to be executed if

all conditions are false