PYTHON

INTRODUCTION

1.what is python ?

   Python is a high level language and it is similar to the language It is interpreter language (executed by line by line) it is easy to learn it has minimal syntax it is used to build software,website,data analysis.

Why Need to Learn Python ?

- Simple and Easy to Learn (readable syntax similar to English.)
- Cross-Platform (Works on Windows, macOS, and Linux.)
- Open Source (free to use and distribute)
- Supports Rapid Development (Used for both small and large-scale projects.)

Where can we use python in real world technologies?

- Python is used in web development to build dynamic websites and web applications.
- Python powers artificial intelligence (AI) applications like chatbots and virtual assistants.
- Python is widely used in machine learning (ML) for tasks like predictions and pattern recognition.
- Python helps in data analysis and data science by processing and visualizing large datasets.

2.Difference between python and other languages?

Feature	Python	Other Languages (C, C++, Java, JS)
Syntax	Simple, clean, close to English	Complex, uses braces {}, semicolons ;
Typing	Dynamically typed	Mostly statically typed (except JavaScript)
Speed	Slower (interpreted language)	Faster (compiled or JIT compiled)

Feature	Python	Other Languages (C, C++, Java, JS)
Memory Management	Automatic (Garbage Collection)	Manual in C/C++, Automatic in Java/JS

3.Variables in Python:

Simply a **variable** in Python is a **name** that is used to **store data** in memory.

Data:

Data is nothing but collection of information.It can be in any form such as numbers,text,images,audio ..etc

Data Types in python:

  1.primitive data typess

  2.non primitive data types

PRIMITIVE DATA TYPES:

<u>Definition:</u>

 Primitive data types are the most basic types of data. They store single,   simple values.

<u>Characteristics:</u>

- They hold individual values (not collections).
- They are immutable (their value cannot be changed after creation).

<u>Common Primitive Types in Python:</u>

int — Integer numbers like 5, -10

float — Decimal numbers like 3.14, -0.001

str — Text or strings like "hello", "Python"

bool — Boolean values True or False

Example:

age = 25   # int

price = 99.99   # float

name = "Reshma"   # str

is_student = True # bool

NON-PRIMITIVE DATA TYPES:

Definition:

Non-primitive data types are more complex and can store collections of values or structured data.

Characteristics:

- They can hold multiple values or key-value pairs.
- Some are mutable (can be changed after creation), others are immutable.

Common Non-Primitive Types in Python:

list — Ordered, mutable collection, e.g., [1, 2, 3]

tuple — Ordered, immutable collection, e.g., (4, 5, 6)

set — Unordered collection of unique elements, e.g., {1, 2, 3}

dict — Collection of key-value pairs, e.g., {"name": "Reshma", "age": 20}

Example:

```
numbers = [1, 2, 3]          # list
coordinates = (10.0, 20.0)      # tuple
unique_ids = {101, 102, 103}     # set
person = {"name": "Reshma", "age": 30} # dict
```