**Introduction to Python**

**What is python?**

Python is a **high-level programming language** that is easy to read and write. It is used to build websites, automate tasks, analyze data, create software, and more. Python is popular because:

* Its syntax is simple and close to English.
* It supports many tools and libraries for different tasks.
* It works on many platforms like Windows, Mac, and Linux.

Lastly, Python is a beginner-friendly and powerful language used in many fields like web development, data science, AI, and automation.

**Why we need to learn python?**

We need to learn Python because:

* **It's easy to learn** – great for beginners.
* **It's widely used** – in jobs like web development, data science, AI, and automation.
* **It saves time** – with simple code and many ready-made tools (libraries).
* **It helps in problem-solving** – and building real-world projects.

In short, learning Python opens the door to many career opportunities and helps you build useful and fun things with code.

**Where we are using python in real tech applications?**

Here are **real-world applications** that are built using Python:

1. **Instagram** – Uses Python (with Django) to handle millions of users and data efficiently.
2. **YouTube** – Uses Python for various features like video processing and recommendations.
3. **Spotify** – Uses Python for data analysis, backend services, and recommendations.
4. **Dropbox** – Built much of its desktop client and server code in Python.
5. **Netflix** – Uses Python for data analysis, automation, and managing content delivery.

These examples show how Python supports large, popular tech platforms.

**What is the difference between python and other languages?**

Python is different from other programming languages because it is:

* **Easy to read and write** – simple, English-like syntax
* **Short and efficient** – does more with fewer lines of code
* **Versatile** – used in web development, data science, AI, automation, and more
* **Well-supported** – has a large community and many built-in tools
* **Cross-platform** – works on different operating systems smoothly

This makes Python a powerful and beginner-friendly language.

**DATATYPES IN PYTHON**

There two types of datatypes in python:

* Primitive datatypes
* Non-primitive datatypes

**Primitive Datatype (Basic Datatype)**

**Definition:**  
Primitive datatypes are the basic built-in data types provided by Python. They represent single values and are the most fundamental types used to build more complex data.

**Examples in Python:**

* int – Integer (e.g., 10)
* float – Decimal (e.g., 3.14)
* bool – Boolean (True or False)
* str – String (e.g., "Hello")

**Non-Primitive Datatype (Derived or Complex Datatype)**

**Definition:**  
Non-primitive datatypes are more complex data structures that can store multiple values or represent collections of data. They are built using primitive types.

**Examples in Python:**

* list – Ordered, changeable collection (e.g., [1, 2, 3])
* tuple – Ordered, unchangeable collection (e.g., (1, 2, 3))
* set – Unordered, unique values (e.g., {1, 2, 3})
* dict – Key-value pairs (e.g., {"name": "John", "age": 25})

### ****What is a Variable in Python?****

A **variable** is a name used to store data in a program.It acts like a **container** that holds a value which can change during the program. You use the = sign to **assign a value** to a variable

**LIST:**

A **list** in Python is a **collection of items** that are **ordered** and **changeable (mutable).** You can store **multiple values** (like numbers, strings, or even other lists) in a single variable using a list.

### ****Key Features:****

* Defined using **square brackets** [ ]
* Items are separated by **commas**
* Can contain **different types of data** (e.g., int, str, float)
* **Indexing** starts from 0 (first item is at index 0)

**DICTIONARY:**

A dictionary in Python is a collection of key-value pairs. It stores data in a way that each key is linked to a value. You use dictionaries when you want to associate pieces of information, like a word and its meaning or a person's name and their age.

**Key Features:**

* Defined using curly braces { }
* Each item has a key and a value, separated by a colon :
* Keys must be unique and immutable (like strings or numbers)
* Values can be any datatype and can be repeated