

# 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