1. What is a Variable?

A **variable** is basically a *name* that stores a value in your computer's memory so you can use it later.

Eg: x = 10

name = "Kavya"

- x -stores the number 10
- name - stores the string "Kavya"

2. Variable Naming Rules

- Must start with a letter or underscore (_)
- Can contain letters, numbers, underscores
- Case-sensitive (Name ≠ name)
- Cannot use Python keywords (if, while, class, etc.)

✅ Valid	❌ Invalid
age = 25	2name = "Hi"
first_name = "Kavya"	first-name=”Hi”
_price = 99.99	

3. Types of Variables

Python is **dynamically typed** → You don't declare the type; Python figures it out at runtime.

Example:

x = 10 # int

x = "Hello" # now str

Main types:

- **Numbers** → int, float, complex
- **Text** → str
- **Boolean** → True / False
- **Sequence** → list, tuple, range
- **Mapping** → dict
- **Set** → set, frozenset
- **NoneType** → None

4. Variable Scope

Where a variable can be accessed:

- **Local** → inside a function
- **Global** → defined outside functions

5. Multiple Assignments

a, b, c = 1, 2, 3

x = y = z = 0

6. Mutable vs Immutable Variables

- **Immutable** → value can't change in place (`int`, `float`, `str`, `tuple`)
- **Mutable** → value can change in place (`list`, `dict`, `set`)

immutable

a = "Hello"

a = a + " World" # creates a new string

mutable

lst = [1, 2] lst.append(3) # changes same list in memory