Types of Variables in Python

In **Python**, **variables** are used to store data values. Based on their **scope** and **usage**, variables are classified into different types.

1. Local Variables

Variables declared inside a function or block and can only be accessed within that function. **Scope:** Limited to the function where they are created.

```
def my_function(): x = 10 # local variable print("Local variable:", x) my_function() # print(x) # ■
Error: x is not accessible outside the function
```

2. Global Variables

Variables declared outside of any function and accessible throughout the program. **Scope:** Entire program.

```
x = 50 # global variable def my_function(): print("Accessing global variable:", x) my_function()
print("Outside function:", x)
```

3. Instance Variables

Variables defined inside a class method (usually __init__) and prefixed with self. **Scope:** Belongs to a specific object (instance) of a class.

```
class Student: def __init__(self, name, age): self.name = name # instance variable self.age = age #
instance variable s1 = Student("John", 21) s2 = Student("Alice", 22) print(s1.name) # John
print(s2.name) # Alice
```

4. Class Variables

Variables that are shared among all objects of a class. Defined inside the class but outside any methods. **Scope:** Shared by all instances of the class.

```
class Student: school_name = "ABC School" # class variable def __init__(self, name): self.name =
name # instance variable s1 = Student("John") s2 = Student("Alice") print(s1.school_name) # ABC
School print(s2.school_name) # ABC School
```

5. Static Variables (Class Level)

Sometimes used as another term for class variables, since they maintain a single copy across all instances. These variables don't change for different objects unless explicitly modified.

Summary Table

Type of Variable	Defined Where	Access Scope	Belongs To
Local Variable	Inside a function	Only that function	Function
Global Variable	Outside all functions	Whole program	Module
Instance Variable	Inside a class method using self	Each object	Object

| Class Variable | Inside class but outside methods | Shared among all objects | Class |