**Que 1 : Understanding the concepts of classes, objects, attributes, and methods in Python.**

**1. Class**

* A **blueprint** or **template** for creating objects.
* Defines **attributes** (variables) and **methods** (functions) that the objects will have.

Example :

class Car:

color = "Red" # Attribute

def start(self): # Method

print("Car started”)

**2. Object**

* An **instance** of a class (something created from the class blueprint).
* Each object can have its own attribute values.

Example :

my\_car = Car() # Create an object

my\_car.start() # Call method → "Car started"

print(my\_car.color) # Access attribute → Red

**3. Attributes**

* **Variables** that belong to a class or object.
* Store **data/state** about the object.

Types:

* **Instance attributes** → belong to a specific object (usually defined inside \_\_init\_\_).
* **Class attributes** → shared by all objects (defined outside methods in the class).

Example :

class Car:

wheels = 4 # Class attribute

def \_\_init\_\_(self, brand, color):

self.brand = brand # Instance attribute

self.color = color

my\_car = Car("Toyota", "Blue")

print(my\_car.brand) # Instance attribute → Toyota

print(my\_car.wheels) # Class attribute → 4

**4. Methods**

* **Functions** inside a class that define behaviors of the object.
* First parameter is always self (refers to the current object).

Example :

class Car:

def \_\_init\_\_(self, brand):

self.brand = brand

def start(self):

print(f"{self.brand} is starting...")

my\_car = Car("Honda")

my\_car.start() # Honda is starting…

**Que 2 : Difference between local and global variables.**

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| --- | --- | --- |
| **Feature** | **Local Variable** | **Global Variable** |
| **Scope** | Inside function only | Entire program |
| **Declared** | Inside a function | Outside all functions |
| **Lifetime** | Created when function starts, destroyed when it ends | Exists until program ends |
| **Access outside function** | ❌ No | ✅ Yes |
| **Modify inside function** | ✅ Yes | ✅ Yes (with global) |