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

**ANS:**

1.Classes **:-**

A **class** is like a blueprint or template for creating objects. It defines the properties (attributes) and behaviors (methods) that the objects created from it will have. A class itself doesn't hold any data; it just defines what kind of objects can be created and what those objects can do.

Ex :

Class abc:

Pass;

2.OBJECT:

An **object** is an instance of a class. It is the actual entity that is created using the blueprint defined by the class. Each object has its own state (values of attributes) and behaviors (methods it can perform).

Ex:

Name=abc()

3.Attributes:-

**Attributes** are the characteristics or properties that objects have. They are variables that belong to a class or an object. Attributes store information about the object, and each object can have different values for these attributes.

Ex:

Class abc:

Def\_\_init\_\_self(self,name,age):

Self.name=name

Self.age=age

4.Method:-

**Methods** are functions that belong to a class and define the behaviors or actions that the objects of that class can perform. Methods take self as the first parameter, which refers to the instance of the object. This allows methods to access and modify the attributes of the object.

Ex.

class Dog:

def \_\_init\_\_(self, name, age):

self.name = name

self.age = age

def bark(self):

print(f"{self.name} says Woof!")

def birthday(self):

self.age += 1

print(f"Happy Birthday {self.name}! Now you're {self.age} years old.")

**Difference between local and global variables**

**Key Differences Between Local and Global Variables:**

| **Aspect** | **Global Variable** | **Local Variable** |
| --- | --- | --- |
| **Definition** | Defined outside functions or classes. | Defined inside a function or block of code. |
| **Scope** | Accessible anywhere in the program. | Accessible only within the function or block it is defined in. |
| **Lifetime** | Exists as long as the program runs. | Exists only during the execution of the function. |
| **Access** | Can be accessed and modified by any function (unless shadowed). | Cannot be accessed outside the function where it is defined. |
| **Usage** | Generally used for values shared across functions. | Used for temporary, function-specific data. |