**Polymorphism in Python:**

The word polymorphism means having many forms. In programming, polymorphism means the same function name (but different signatures) being used for different types. The key difference is the data types and number of arguments used in function.

Polymorphism comes in different forms, two of the most common being:

**1.Compile-time Polymorphism (Method Overloading):**

defining multiple methods in the same class with the same name but different parameter lists. Method overloading is also sometimes referred to as "static polymorphism" or "early binding."

class MathOperations:

    def add(self, a, b,c=100):

        return a+b+c

# Create an instance of MathOperations

Class\_object = MathOperations()

# Calling the add method with different argument counts

print(Class\_object.add(5,10))

print(Class\_object.add(5,10,20))

##################################OUTPUT##################################

115

35

1. **Runtime Polymorphism (Method Overriding):**

a subclass provides a specific implementation for a method that is already defined in its superclass.

This allows a subclass object to override or replace the behavior of the method inherited from the superclass. The actual method to be executed is determined during runtime based on the object's actual type. This form of polymorphism is also known as "dynamic polymorphism" or "late binding."

class Animal:

    def speak(self):

        pass  # Placeholder method

class Dog(Animal):

    def speak(self):

        return "Woof!"

class Cat(Animal):

    def speak(self):

        return "Meow!"

# Create instances of Dog and Cat

dog = Dog()

cat = Cat()

# Call the speak method on instances

print(dog.speak())  # Output: Woof!

print(cat.speak())  # Output: Meow!

###########OUTPUT#################

Woof!

Meow!

**Polymorphism is a programming concept that refers to the ability of objects to take on multiple forms or behaviors. It is a core pillar of Object-Oriented Programming (OOP) but is not limited to OOP.**

Polymorphism is a widely used programming concept and is not limited to any particular programming language or paradigm. It can be implemented in many programming paradigms, including procedural, functional, and object-oriented programming.

