



Class/Object (OOP)

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```
class Point:
    def __init__(self, f, s):
        self.x = f
        self.y = s

    def move(self):
        print('move')

    def draw(self):
        print('draw')
```

```
obj = Point(1000, 2000)
obj.x = 1500
print(obj.x, obj.y)
obj.move()
obj.draw()
```

```
"C:\Users\Hiren\
1500 2000
move
draw
```

```
Hi, My Name is Pradip
Hi, My Name is Sanjay
```

```
class Student:

    # parameterized constructor
    def __init__(self, n):
        self.name = n

    def talk(self):
        print("Hi, My Name is " + self.name)
```

```
student1 = Student('Pradip')
student1.talk()
```

```
student2 = Student('Sanjay')
student2.talk()
```



Class/Object (OOP)

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```
entrance.py  classes.py
class Person:
    def displayperson(self):
        print('This is a person class')

class Employee(Person):
    def displayemployee(self):
        print('This is an Employee class')

class Student(Person):
    def displaystudent(self):
        print('This is a student class')

emp = Employee()
emp.displayperson()
emp.displayemployee()

stu = Student()
stu.displayperson()
stu.displaystudent()
```

```
This is a person class
This is an Employee class
This is a person class
This is a student class
```

```
"C:\U
0
1
1
0
```

```
class User:
    def __init__(self, userID, userName):
        self.id = userID
        self.username = userName
        self.following = 0
        self.followers = 0

    def follow(self, user):
        user.followers += 1
        self.following += 1

user1 = User("1", "Hiren")
user2 = User("1", "Pradip")

user1.follow(user2)

print(user1.followers)
print(user1.following)
print(user2.followers)
print(user2.following)
```



Polymorphism (OOP)

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#Program (In-built Polymorphism)

```
print (len([10, 20, 30, 40]))  
print (len((11, 22, 33)))  
print (len({40, 50, 60, 70, 80}))  
print (len({"Hiren": 47, "Pradip": 32}))
```

Output

4
3
5
2

#Program (Polymorphism with user-defined function)

```
def add(x, y, z = 0):  
    return x + y + z  
  
print(add(2, 3))  
print(add(2, 3, 4))
```

Output

5
9



Polymorphism (OOP)

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```
#Program (Polymorphism with class methods)
```

```
class India():  
    def capital(self):  
        print("New Delhi is the capital of India")  
  
class USA():  
    def capital(self):  
        print("Washington, D.C. is the capital of USA")  
  
class UAE():  
    def capital(self):  
        print("Abu Dhabi is the capital of UAE")  
  
obj_ind = India()  
obj_usa = USA()  
obj_uae = UAE()  
for country in (obj_ind, obj_usa, obj_uae):  
    country.capital()
```

Output

```
New Delhi is the capital of India  
Washington, D.C. is the capital of USA  
Abu Dhabi is the capital of UAE
```



Polymorphism (OOP)

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**Program (Polymorphism with Inheritance
(along with Method Overriding))**

```
class Bird:
    def about(self):
        print("This is a bird class -  
Parent class")

    def canFly(self):
        print("Not all birds can fly")

class sparrow(Bird):
    def canFly(self):
        print("Sparrows can fly.")

class ostrich(Bird):
    def canFly(self):
        print("Ostriches cannot fly.")
```

```
obj_bird = Bird()
obj_spr = sparrow()
obj_ost = ostrich()
obj_bird.about()
obj_bird.canFly()
obj_spr.about()
obj_spr.canFly()
obj_ost.about()
obj_ost.canFly()
```

Output

```
This is a bird class - Parent class
Not all birds can fly
This is a bird class - Parent class
Sparrows can fly.
This is a bird class - Parent class
Ostriches cannot fly.
```



Polymorphism (OOP)

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Program (Polymorphism with a function and objects)

```
class India():
    def capital(self):
        print("New Delhi is the capital of India")

class USA():
    def capital(self):
        print("Washington, D.C. is the capital of USA")

class UAE():
    def capital(self):
        print("Abu Dhabi is the capital of UAE")

for country in (obj_ind, obj_usa, obj_uae):
    country.capital()

def func(obj):
    obj.capital()
```

```
obj_ind = India()
obj_usa = USA()
obj_uae = UAE()
```

```
func(obj_ind)
func(obj_usa)
func(obj_uae)
```

Output

```
New Delhi is the capital of India
Washington, D.C. is the capital of USA
Abu Dhabi is the capital of UAE
New Delhi is the capital of India
Washington, D.C. is the capital of USA
Abu Dhabi is the capital of UAE
```