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Roll no: 41		Tutorial No: 5	
Title of LAB Assignment: To implement programs on OOP Concepts in python			
DOP: 25-10-2023		DOS:	
CO Mapped:	PO Mapped:		Signature:

1. Aim:

To demonstrate various Python programming concepts, including class creation, multiple inheritance, method overloading, operator overloading, and exception handling.

2. Theory:

Creating a class to compute the area and perimeter of a circle.

Implementing multiple inheritance in Python.

Defining a program with the same method name but multiple arguments.

Overloading operators in Python.

Handling various exceptions in Python.

3. Code:

import math

A. Creating a Class to Compute the Area and Perimeter of a Circle:

```
class Circle:
    def __init__(self, radius):
        self.radius = radius

    def area(self):
        return math.pi * self.radius**2

    def perimeter(self):
        return 2 * math.pi * self.radius

circle = Circle(5)
print("Circle Area:", circle.area())
print("Circle Perimeter:", circle.perimeter())
```

B. Implementing Multiple Inheritance in Python:

```
class Parent1:
    def show(self):
        print("This is from Parent1")

class Parent2:
    def show(self):
        print("This is from Parent2")

class Child(Parent1, Parent2):
    pass

child = Child()
child.show()
```

C. Defining a Program with the Same Method Name but Multiple Arguments:

```
class MyClass:
    def argsMethods(self, arg1, arg2=None):
        if arg2 is not None:
            print(f"Arguments: {arg1}, {arg2}")
        else:
            print(f"Argument: {arg1}")

obj = MyClass()
obj.example_method(10)
obj.example_method(20, 30)
```

D. Overloading Operators in Python:

```
class ComplexNumber:
    def __init__(self, real, imag):
        self.real = real
        self.imag = imag

    def __add__(self, other):
        return ComplexNumber(self.real + other.real, self.imag + other.imag)

    def __str__(self):
        return f"{self.real} + {self.imag}i"

c1 = ComplexNumber(1, 2)
c2 = ComplexNumber(3, 4)
c3 = c1 + c2
print("Sum of Complex Numbers:", c3)
```

E. Handling Various Exceptions in Python:

```
try:
   num1 = int(input("Enter a number: "))
   num2 = int(input("Enter another number: "))
   result = num1 / num2
   print("Result:", result)
except ZeroDivisionError:
   print("Division by zero is not allowed.")
except ValueError:
   print("Invalid input. Please enter a valid number.")
except Exception as e:
   print(f"An error occurred: {e}")
```

4. Conclusion:

In this practical, we demonstrated various Python programming concepts, including class creation, multiple inheritance, method overloading, operator overloading, and exception handling. These concepts are fundamental for building robust and versatile Python programs.

5. Output:

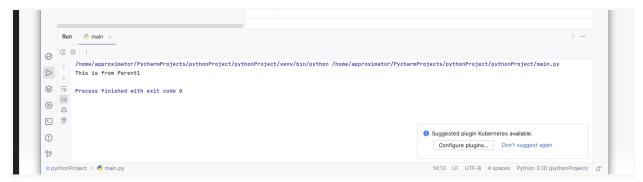
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В.



C.

```
Run main ×

G :

// home/approximator/PycharmProjects/pythonProject/venv/bin/python /home/approximator/PycharmProjects/pythonProject/main.py

Arguments: 10

Arguments: 20, 30

Process finished with exit code 0

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pythonProject > main.py

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```

D.

E.

