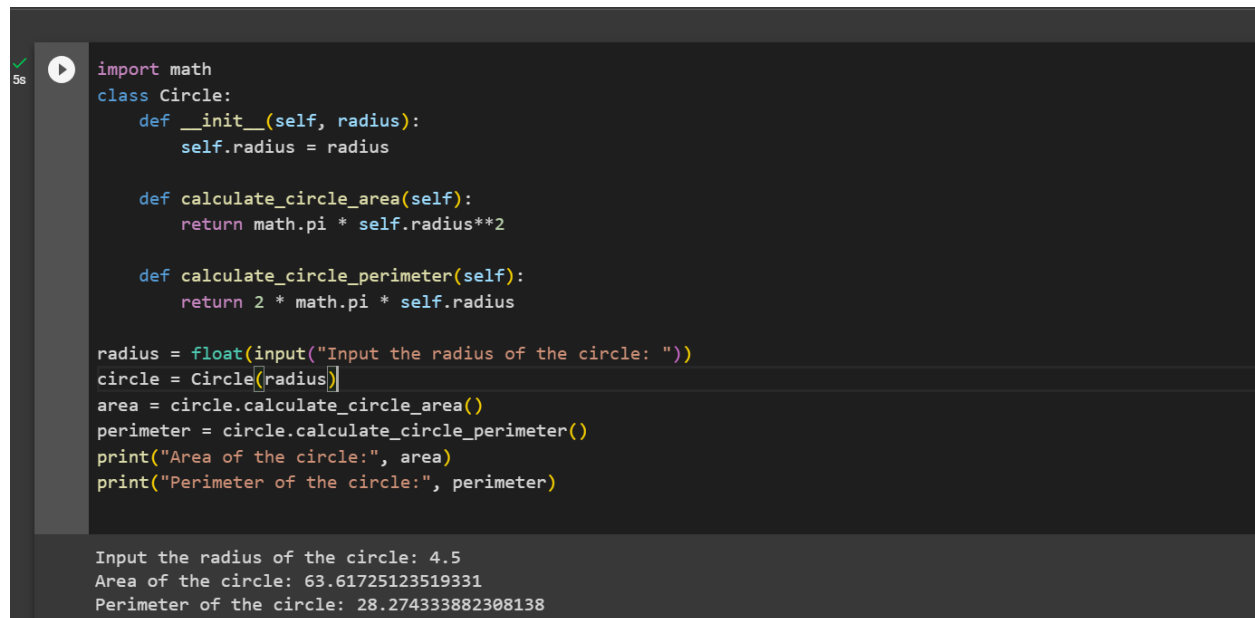1. Write a Python program to create a class representing a Circle. Include methods to calculate its area and perimeter.

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

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

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

radius = float(input("Input the radius of the circle: "))
circle = Circle(radius)
area = circle.calculate_circle_area()
perimeter = circle.calculate_circle_perimeter()
print("Area of the circle:", area)
print("Perimeter of the circle:", perimeter)
```

```
Input the radius of the circle: 4.5
Area of the circle: 63.61725123519331
Perimeter of the circle: 28.274333882308138
```

2. Write a Python program to create a calculator class. Include methods for basic arithmetic operations.

```python
class Calculator:
    def add(self, x, y):
        return x + y
    def subtract(self, x, y):
        return x - y
    def multiply(self, x, y):
        return x * y
    def divide(self, x, y):
        if y != 0:
            return x / y
        else:
            return ("Cannot divide by zero.")
calculator = Calculator()
# Addition
result = calculator.add(4, 5)
print("4 + 5 =", result)
# Subtraction
result = calculator.subtract(24, 21)
print("24 - 21 =", result)
# Multiplication
result = calculator.multiply(24, 2)
print("24 * 2 =", result)
```

```python
# Division
result = calculator.divide(14, 2)
print("14 / 2 =", result)
# Division by zero (raises an error)
result = calculator.divide(35, 0)
print("35 / 0 =", result)
```

```
4 + 5 = 9
24 - 21 = 3
24 * 2 = 48
14 / 2 = 7.0
35 / 0 = Cannot divide by zero.
```

3. Write a Python program to create a class that represents a shape. Include methods to calculate its area and perimeter. Implement subclasses for different shapes like circle, triangle, and square.

```python
[4]  import math

     class Shape:
         def calculate_area(self):
             pass

         def calculate_perimeter(self):
             pass


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

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

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


     class Rectangle(Shape):
```

```python
class Rectangle(Shape):
    def __init__(self, length, width):
        self.length = length
        self.width = width

    def calculate_area(self):
        return self.length * self.width

    def calculate_perimeter(self):
        return 2 * (self.length + self.width)


class Triangle(Shape):
    def __init__(self, base, height, side1, side2, side3):
        self.base = base
        self.height = height
        self.side1 = side1
        self.side2 = side2
        self.side3 = side3

    def calculate_area(self):
        return 0.5 * self.base * self.height

    def calculate_perimeter(self):
        return self.side1 + self.side2 + self.side3
```

```python
print("Radius of the circle:",r)
print("Circle Area:", circle_area)
print("Circle Perimeter:", circle_perimeter)


l = 5
w = 7
rectangle = Rectangle(l, w)
rectangle_area = rectangle.calculate_area()
rectangle_perimeter = rectangle.calculate_perimeter()
print("\nRectangle: Length =",l," Width =",w)
print("Rectangle Area:", rectangle_area)
print("Rectangle Perimeter:", rectangle_perimeter)

base = 5
height = 4
s1 = 4
s2 = 3
s3 = 5

print("\nTriangle: Base =",base," Height =",height," side1 =",s1," side2 =",s2," side3 =",s3)
triangle = Triangle(base,height,s1,s2,s3)
triangle_area = triangle.calculate_area()
triangle_perimeter = triangle.calculate_perimeter()
print("Triangle Area:", triangle_area)
print("Triangle Perimeter:", triangle_perimeter)
```

```
Radius of the circle: 7
Circle Area: 153.93804002589985
Circle Perimeter: 43.982297150257104

Rectangle: Length = 5  Width = 7
Rectangle Area: 35
Rectangle Perimeter: 24

Triangle: Base = 5  Height = 4  side1 = 4  side2 = 3  side3 = 5
Triangle Area: 10.0
Triangle Perimeter: 12
```