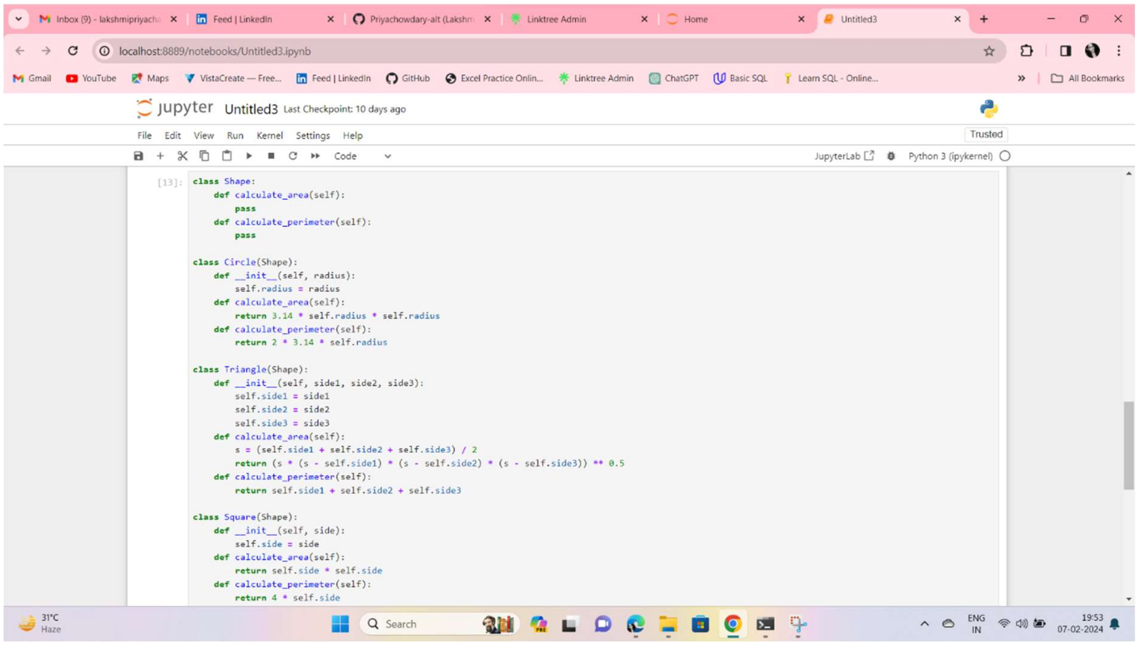
PYTHON ASSIGNMENT-1

1) 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.

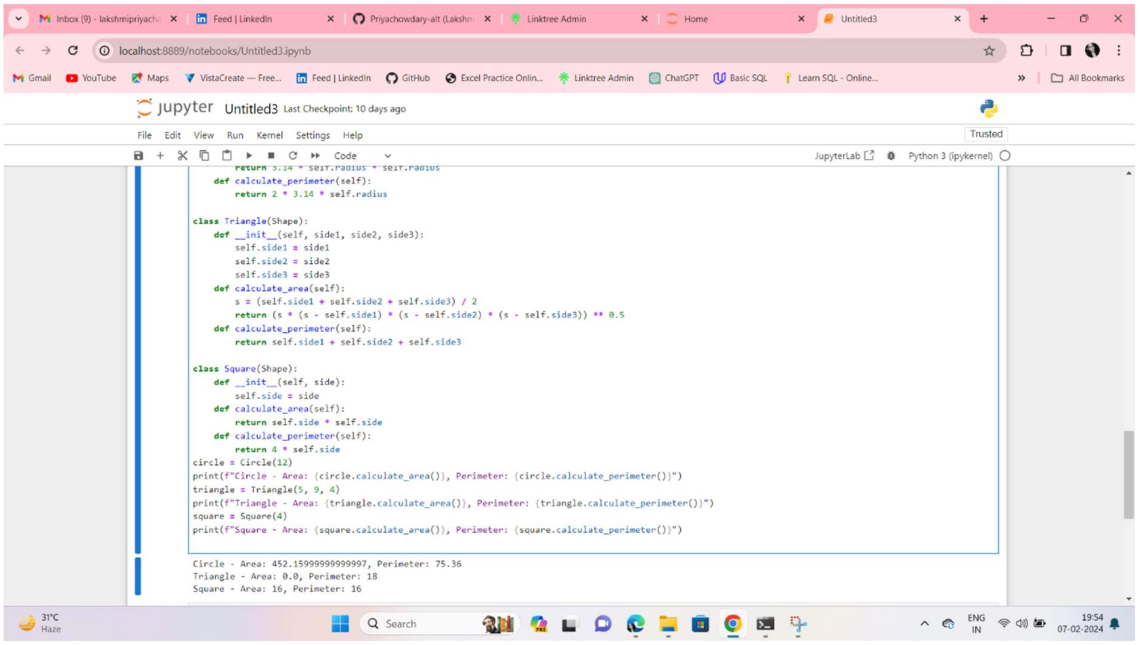


```
[13]: class Shape:
          def calculate_area(self):
              pass
          def calculate_perimeter(self):
              pass

      class Circle(Shape):
          def __init__(self, radius):
              self.radius = radius
          def calculate_area(self):
              return 3.14 * self.radius * self.radius
          def calculate_perimeter(self):
              return 2 * 3.14 * self.radius

      class Triangle(Shape):
          def __init__(self, side1, side2, side3):
              self.side1 = side1
              self.side2 = side2
              self.side3 = side3
          def calculate_area(self):
              s = (self.side1 + self.side2 + self.side3) / 2
              return (s * (s - self.side1) * (s - self.side2) * (s - self.side3)) ** 0.5
          def calculate_perimeter(self):
              return self.side1 + self.side2 + self.side3

      class Square(Shape):
          def __init__(self, side):
              self.side = side
          def calculate_area(self):
              return self.side * self.side
          def calculate_perimeter(self):
              return 4 * self.side
```



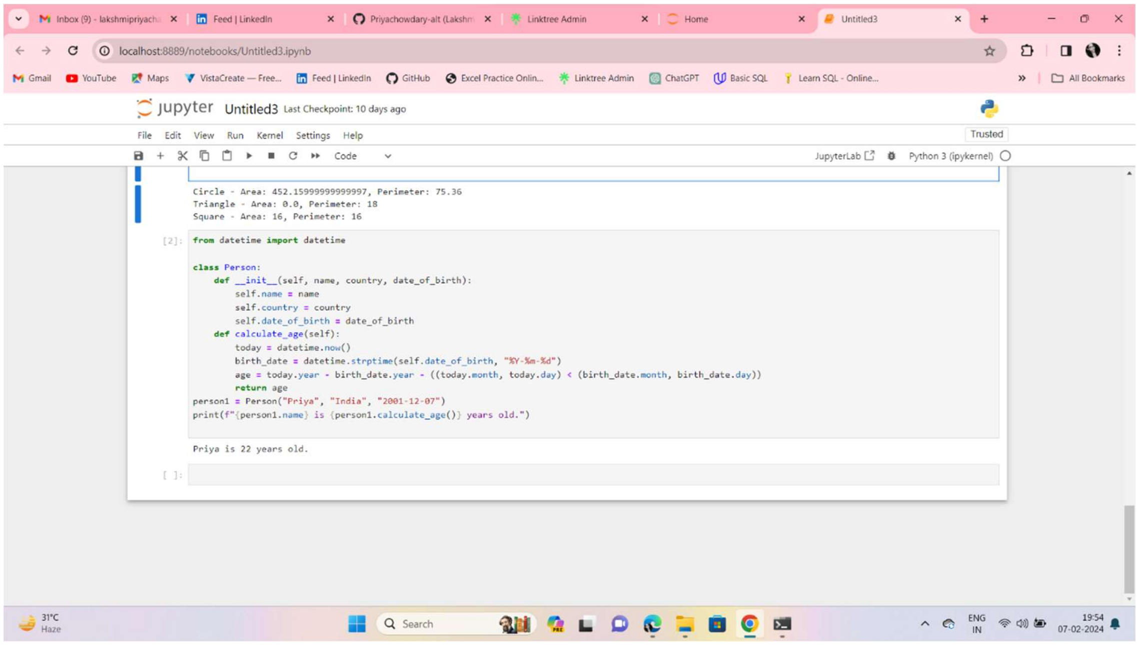
```
    def calculate_perimeter(self):
        return 2 * 3.14 * self.radius

class Triangle(Shape):
    def __init__(self, side1, side2, side3):
        self.side1 = side1
        self.side2 = side2
        self.side3 = side3
    def calculate_area(self):
        s = (self.side1 + self.side2 + self.side3) / 2
        return (s * (s - self.side1) * (s - self.side2) * (s - self.side3)) ** 0.5
    def calculate_perimeter(self):
        return self.side1 + self.side2 + self.side3

class Square(Shape):
    def __init__(self, side):
        self.side = side
    def calculate_area(self):
        return self.side * self.side
    def calculate_perimeter(self):
        return 4 * self.side
circle = Circle(12)
print(f"Circle - Area: {circle.calculate_area()}, Perimeter: {circle.calculate_perimeter()}")
triangle = Triangle(5, 9, 4)
print(f"Triangle - Area: {triangle.calculate_area()}, Perimeter: {triangle.calculate_perimeter()}")
square = Square(4)
print(f"Square - Area: {square.calculate_area()}, Perimeter: {square.calculate_perimeter()}")
```

```
Circle - Area: 452.15999999999997, Perimeter: 75.36
Triangle - Area: 0.0, Perimeter: 18
Square - Area: 16, Perimeter: 16
```

2)Write a Python program to create a person class. Include attributes like name, country and date of birth. Implement a method to determine the person's age.



```
Circle - Area: 452.15999999999997, Perimeter: 75.36
Triangle - Area: 0.0, Perimeter: 18
Square - Area: 16, Perimeter: 16
```

[2]:
```python
from datetime import datetime

class Person:
    def __init__(self, name, country, date_of_birth):
        self.name = name
        self.country = country
        self.date_of_birth = date_of_birth
    def calculate_age(self):
        today = datetime.now()
        birth_date = datetime.strptime(self.date_of_birth, "%Y-%m-%d")
        age = today.year - birth_date.year - ((today.month, today.day) < (birth_date.month, birth_date.day))
        return age
person1 = Person("Priya", "India", "2001-12-07")
print(f"{person1.name} is {person1.calculate_age()} years old.")
```

```
Priya is 22 years old.
```