Test 3

1. Print the sum, difference and product of two complex numbers by creating a class named 'Complex' with separate methods for each operation whose real and imaginary parts are entered by the user.

```
class Complex ():
    def initComplex(self):
        self.realPart = int(input("Enter the Real Part:
"))
        self.imgPart = int(input("Enter the Imaginary
Part: "))
    def display(self):
        print(self.realPart,"+",self.imgPart,"i", sep="")

    def sum(self, c1, c2):
        self.realPart = c1.realPart + c2.realPart
        self.imgPart = c1.imgPart + c2.imgPart
    def difference(self, c1, c2):
        self.realPart = c1.realPart - c2.realPart
        self.imgPart = c1.imgPart - c2.imgPart
    def product(self, c1, c2):
        self.realPart = c1.realPart * c2.realPart
        self.imgPart = c1.imgPart * c2.imgPart
c1 = Complex()
c2 = Complex()
c3 = Complex()
c4=Complex()
c5=Complex()
print("Enter first complex number")
c1.initComplex()
print("First Complex Number: ", end="")
c1.display()
print("Enter second complex number")
c2.initComplex()
print("Second Complex Number: ", end="")
c2.display()
print("Sum of two complex numbers is ", end="")
c3.sum(c1,c2)
```

```
c3.display()
print("Difference of two complex numbers is ", end="")
c4.difference(c1,c2)
c4.display()
print("Product of two complex numbers is ", end="")
c5.product(c1,c2)
c5.display()
```

Output:

```
Enter first complex number
Enter the Real Part: 3
Enter the Imaginary Part: 4
First Complex Number: 3+4i
Enter second complex number
Enter the Real Part: 1
Enter the Imaginary Part: 2
Second Complex Number: 1+2i
Sum of two complex numbers is 4+6i
Difference of two complex numbers is 2+2i
Product of two complex numbers is 3+8i
```

2. Create an abstract class representing equilateral polygon with required abstract and concrete methods and properties to calculate area and perimeter of it. Create classes for Rectangle, Square and Regular Pentagon by implementing a polygon class to calculate the area and perimeter of them.

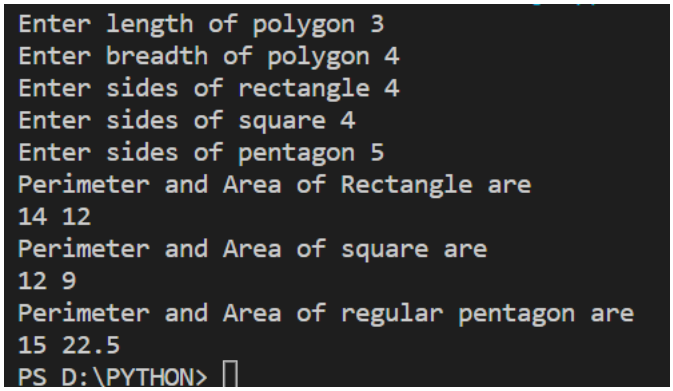
Also overload the comparison operators for above classes to compare them by their calculated area.

In the main function, ask the user number of sides and length of the polygon and print their area and perimeter accordingly

```
from abc import ABC, abstractmethod

class Polygon(ABC):

    @abstractmethod
    def perimeter(self):
        pass
    def area(self):
        pass

class Rectangle(Polygon):
```

```
    def perimeter(self,length,breadth):
        return 2*(length+breadth)
    def area(self,length,breadth):
        return length*breadth

class Square(Polygon):
    def perimeter(self,length,sides):
        return sides*length
    def area(self,length):
        return length*length

class Rpentagon(Polygon):
    def perimeter(self,length,sides):
        return sides*length
    def area(self,length,sides):
        return 1/2*sides*length*length
length=int(input("Enter length of polygon "))
breadth=int(input("Enter breadth of polygon "))
sidesR=int(input("Enter sides of rectangle "))
sidesS=int(input("Enter sides of square "))
sidesP=int(input("Enter sides of pentagon "))
R=Rectangle()
print("Perimeter and Area of Rectangle are ")
print(R.perimeter(length,breadth),R.area(length,breadth))
S=Square()
print("Perimeter and Area of square are ")
print(S.perimeter(length,sidesS),S.area(length))
P=Rpentagon()
print("Perimeter and Area of regular pentagon are ")
print(P.perimeter(length,sidesP),P.area(length,sidesP))
```

Output:


Enter length of polygon 3
Enter breadth of polygon 4
Enter sides of rectangle 4
Enter sides of square 4
Enter sides of pentagon 5
Perimeter and Area of Rectangle are
14 12
Perimeter and Area of square are
12 9
Perimeter and Area of regular pentagon are
15 22.5
PS D:\PYTHON>