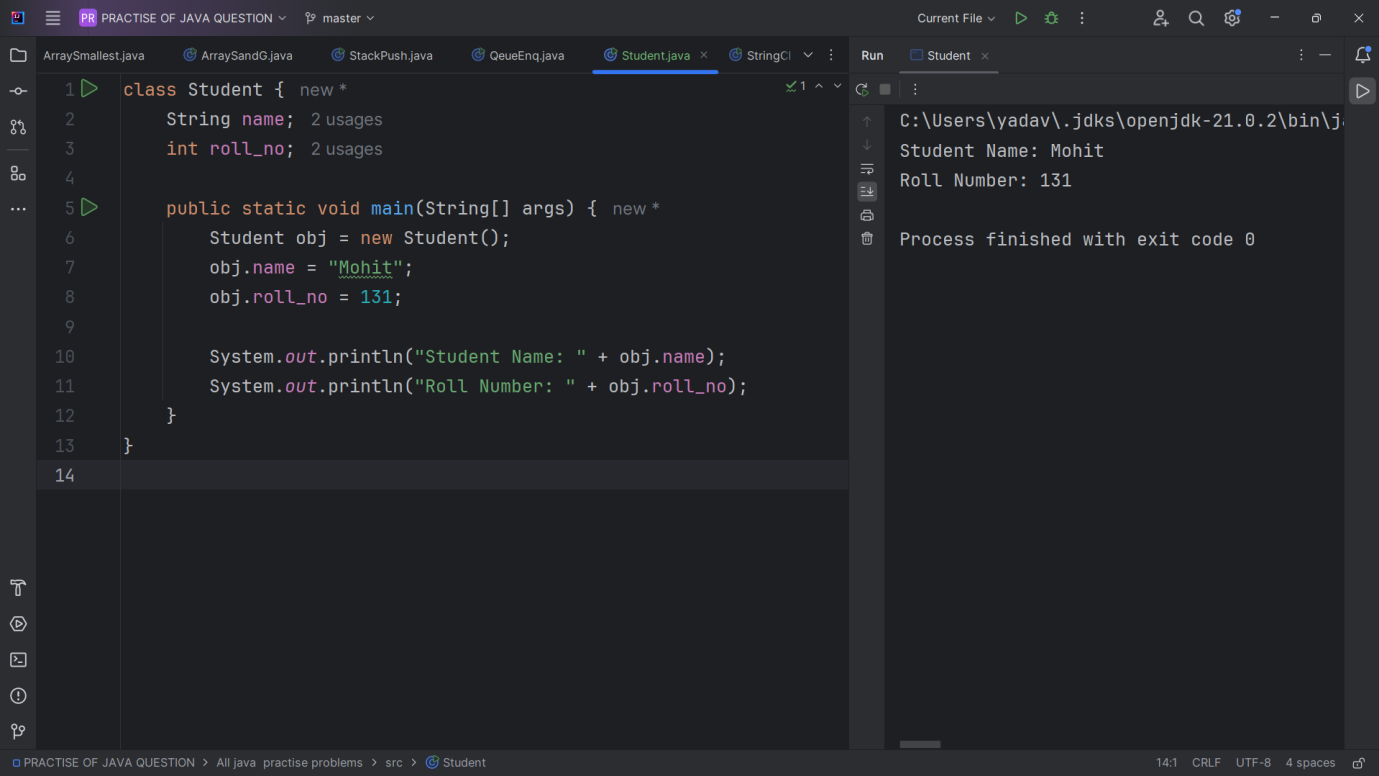
**// JAVA OOPS ASSIGNMENTS – 1 //**

**QUESTION 1 - >Create a class name ‘Student’ with string variable ‘name’ and integer variable ‘roll\_no’. Assign the value of roll\_no as ‘2’ and that of name as “Mohit” by creating an object of the class Student.**

**ANS - **

**QUESTION 2 -> Assign and print the roll number, phone number and address of two students having name “Mohit” and “Sanjay” respectively by creating two objects of class ‘Student1’.**

**ANS->** class Student1 {  
 String name;  
 int roll\_no;  
 String phone\_no;  
 String address;  
  
 public static void main(String[] args) {  
 Student1 student1 = new Student1();  
 student1.name = "Mohit";  
 student1.roll\_no = 101;  
 student1.phone\_no = "9876543210";  
 student1.address = "Delhi";  
  
 Student1 student2 = new Student1();  
 student2.name = "Sanjay";  
 student2.roll\_no = 102;  
 student2.phone\_no = "8765432109";  
 student2.address = "Mumbai";  
  
 System.*out*.println("Name: " + student1.name);  
 System.*out*.println("Roll Number: " + student1.roll\_no);  
 System.*out*.println("Phone Number: " + student1.phone\_no);  
 System.*out*.println("Address: " + student1.address);  
  
 System.*out*.println();  
  
 System.*out*.println("Name: " + student2.name);  
 System.*out*.println("Roll Number: " + student2.roll\_no);  
 System.*out*.println("Phone Number: " + student2.phone\_no);  
 System.*out*.println("Address: " + student2.address);  
 }  
}

**OUTPUT->**

**Name: Mohit**

**Roll Number: 101**

**Phone Number: 9876543210**

**Address: Delhi**

**Name: Sanjay**

**Roll Number: 102**

**Phone Number: 8765432109**

**Address: Mumbai**

**Process finished with exit code 0**

**QUESTION 3 ->Write a program to print the area and perimeter of a triangle having sides of 3,4 and 5 units by creating a class named ‘Triangle’ without any parameter in its constructor.**

**ANS ->** class Triangle {  
 int a, b, c;  
 double area, perimeter;  
  
 Triangle() {  
 a = 3;  
 b = 4;  
 c = 5;  
 perimeter = a + b + c;  
 double s = perimeter / 2;  
 area = Math.*sqrt*(s \* (s - a) \* (s - b) \* (s - c));  
 }  
  
 public static void main(String[] args) {  
 Triangle obj = new Triangle();  
  
 System.*out*.println("Perimeter: " + obj.perimeter);  
 System.*out*.println("Area: " + obj.area);  
 }  
}

**OUTPUT :** **Perimeter: 12.0**

**Area: 6.0**

**QUESTION 4 -> Write a program to print the area and perimeter of a triangle having sides of 3, r and 5 unite by creating a class named ‘Triangle’ with constructors having the three sides as its parameters.**

class Triangle1 {  
 double a, b, c;  
  
 Triangle1(double a, double b, double c) {  
 this.a = a;  
 this.b = b;  
 this.c = c;  
 }  
  
 double getPerimeter() {  
 return a + b + c;  
 }  
  
 double getArea() {  
 double s = getPerimeter() / 2;  
 return Math.*sqrt*(s \* (s - a) \* (s - b) \* (s - c));  
 }  
}  
  
public class Main {  
 public static void main(String[] args) {  
 Triangle1 t = new Triangle1(3, 4, 5);  
 System.*out*.println("Perimeter: " + t.getPerimeter());  
 System.*out*.println("Area: " + t.getArea());  
 }  
}

**OUTPUT->**

**Perimeter: 12.0**

**Area: 6.0**

**QUESTION 5 -> Write a program to print the area of two rectangles having sides(4,5) and (5,8) respectively by creating a class named ‘Rectangle’ with a method named ‘Area’ which returns the area and length and breadth passed as parameters to its constructor.**

class Rect {  
 double length, breadth;  
  
 Rect(double length, double breadth) {  
 this.length = length;  
 this.breadth = breadth;  
 }  
  
 double getArea() {  
 return length \* breadth;  
 }  
}  
  
public class Main1 {  
 public static void main(String[] args) {  
 Rect r1 = new Rect(4, 5);  
 Rect r2 = new Rect(5, 8);  
 System.*out*.println("Area of first rectangle: " + r1.getArea());  
 System.*out*.println("Area of second rectangle: " + r2.getArea());  
 }  
}

**OUTPUT ->**

**Area of first rectangle: 20.0**

**Area of second rectangle: 40.0**

**QUESTION -> 6. Write a program to print the area of a rectangle by creating a class**

**named ‘Area’ having two methods. First method named as ‘setDim’ takes**

**length and breadth of rectangle as parameters and the second method**

**named as’getArea’ returns the area of the rectangle. Length and breadth**

**of rectangle are entered through keyboard.**

import java.util.Scanner;  
  
class Area {  
 private double length, breadth;  
  
 void setDim(double length, double breadth) {  
 this.length = length;  
 this.breadth = breadth;  
 }  
  
 double getArea() {  
 return length \* breadth;  
 }  
}  
  
public class RectangleArea {  
 public static void main(String[] args) {  
 Scanner scanner = new Scanner(System.*in*);  
 Area rectangle = new Area();  
 System.*out*.print("Enter length: ");  
 double length = scanner.nextDouble();  
 System.*out*.print("Enter breadth: ");  
 double breadth = scanner.nextDouble();  
 rectangle.setDim(length, breadth);  
 System.*out*.println("Area of Rectangle: " + rectangle.getArea());  
 scanner.close();  
 }  
}

**OUTPUT ->**

**Enter length: 5**

**Enter breadth: 6**

**Area of Rectangle: 30.0**

**QUESTION -> 7. Write a program to print the area of a rectangle by creating a class**

**named ‘Area’ taking the values of its length and breadth as parameters of**

**its constructor and having a method named**

**‘return Area’ which returns**

**the area of the rectangle. Length and breadth of rectangle are entered**

**through keyboard.**

import java.util.Scanner;  
  
class Area1 {  
 private double length;  
 private double breadth;  
  
 Area1(double length, double breadth) {  
 this.length = length;  
 this.breadth = breadth;  
 }  
  
 double returnArea() {  
 return length \* breadth;  
 }  
}  
  
public class Main3 {  
 public static void main(String[] args) {  
 Scanner scanner = new Scanner(System.*in*);  
 double length = scanner.nextDouble();  
 double breadth = scanner.nextDouble();  
 Area1 rectangle = new Area1(length, breadth);  
 System.*out*.println(rectangle.returnArea());  
 scanner.close();  
 }  
}

OUTPUT ->

10

20

200.0

QUESTION -> 8. Print the average of three numbers entered by user by creating a class

named ‘Average’ having a method to calculate and print the average.

import java.util.Scanner;  
  
class Average {  
 void calculateAndPrintAverage(double num1, double num2, double num3) {  
 double average = (num1 + num2 + num3) / 3;  
 System.*out*.println("Average: " + average);  
 }  
}  
  
public class Main5 {  
 public static void main(String[] args) {  
 Scanner scanner = new Scanner(System.*in*);  
 System.*out*.print("Enter three numbers: ");  
 double num1 = scanner.nextDouble();  
 double num2 = scanner.nextDouble();  
 double num3 = scanner.nextDouble();  
 scanner.close();  
 Average avg = new Average();  
 avg.calculateAndPrintAverage(num1, num2, num3);  
 }  
}

OUTPUT->

Enter three numbers: 5

4

3

Average: 4.0

QUESTION -> 9. 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 user.

import java.util.Scanner;  
  
class Complex {  
 private double real, imag;  
  
 Complex(double real, double imag) {  
 this.real = real;  
 this.imag = imag;  
 }  
  
 Complex add(Complex other) {  
 return new Complex(this.real + other.real, this.imag + other.imag);  
 }  
  
 Complex subtract(Complex other) {  
 return new Complex(this.real - other.real, this.imag - other.imag);  
 }  
  
 Complex multiply(Complex other) {  
 double realPart = this.real \* other.real - this.imag \* other.imag;  
 double imagPart = this.real \* other.imag + this.imag \* other.real;  
 return new Complex(realPart, imagPart);  
 }  
  
 void display() {  
 System.*out*.println(real + (imag >= 0 ? " + " : " ") + imag + "i");  
 }  
}  
  
public class ComplexOperations {  
 public static void main(String[] args) {  
 Scanner scanner = new Scanner(System.*in*);  
 System.*out*.print("Enter real and imaginary part of first complex number: ");  
 Complex num1 = new Complex(scanner.nextDouble(), scanner.nextDouble());  
 System.*out*.print("Enter real and imaginary part of second complex number: ");  
 Complex num2 = new Complex(scanner.nextDouble(), scanner.nextDouble());  
 System.*out*.print("Sum: ");  
 num1.add(num2).display();  
 System.*out*.print("Difference: ");  
 num1.subtract(num2).display();  
 System.*out*.print("Product: ");  
 num1.multiply(num2).display();  
 scanner.close();  
 }  
}

OUTPUT->

Enter real and imaginary part of first complex number: 8

9

Enter real and imaginary part of second complex number: 6

4

Sum: 14.0 + 13.0i

Difference: 2.0 + 5.0i

Product: 12.0 + 86.0i