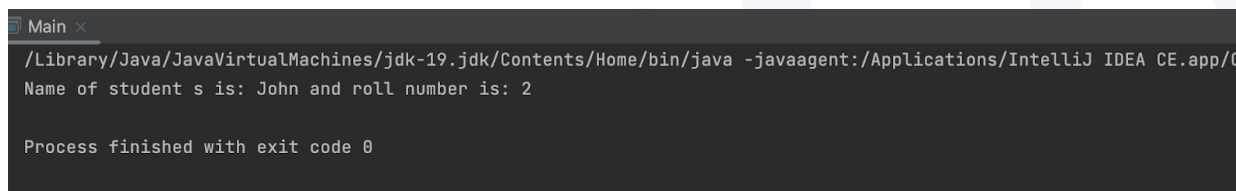# Introduction to OOPs

Assignment Solutions

Q1. Create a class named 'Student' with String variable 'name' and integer variable 'roll_no'. Assign the value of roll_no as '2' and that of name as "John" by creating an object of the class Student.

Code:

```java
class Student{
    String name;
    int roll_no;
}
public class Test {
    public static void main(String[] args) {
        Student s = new Student();
        s.name = "John";
        s.roll_no = 2;
        System.out.println("Name of student s is: " + s.name + " and roll number is: "  + s.roll_no);
    }
}
```

```
Main
/Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bin/java -javaagent:/Applications/IntelliJ IDEA CE.app/Cc
Name of student s is: John and roll number is: 2

Process finished with exit code 0
```

Q2. 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.

Code:

```java
class Triangle{
    int a,b,c;
    public double getArea(){
        double s = (a+b+c)/2.0;
        return Math.pow((s*(s-a)*(s-b)*(s-c)),.5);
    }
    public double getPerimeter(){
        return (a+b+c)/2.0;
    }
}

public class Test {
    public static void main(String[] args){
        Triangle t = new Triangle();
        t.a = 2;
        t.b = 5;
        t.c = 6;
        System.out.println(t.getArea());
        System.out.println(t.getPerimeter());
    }
}
```

```
Main ×
 /Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home
 4.683748498798798
 6.5

 Process finished with exit code 0
```

Q3. 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 'returnArea' which returns the area of the rectangle. Length and breadth of rectangle are entered through keyboard.

Code:

```java
import java.util.*;
class Area{
    int length;
    int breadth;
    public Area(int l, int b){
        length = l;
        breadth = b;
    }
    public int getArea(){
        return length*breadth;
    }
}
public class Test {
    public static void main(String[] args){
        Scanner s = new Scanner(System.in);
        int l,b;
        System.out.println("Enter length");
        l = s.nextInt();
        System.out.println("Enter breadth");
        b = s.nextInt();
        Area a = new Area(l,b);
        System.out.println("Area : "+a.getArea());
    }
}
```

```
Enter length
4
Enter breadth
5
Area : 20

Process finished with exit code 0
```

Q4. 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..

Code:

```java
import java.util.Scanner;
class Complex{
    int real;
    int imag;
    public Complex(int r, int i){
        real = r;
        imag = i;
    }

    public static Complex add(Complex a, Complex b){
        return new Complex((a.real+b.real),(a.imag+b.imag));
    }

    public static Complex diff(Complex a, Complex b){
        return new Complex((a.real-b.real),(a.imag-b.imag));
    }

    public static Complex product(Complex a, Complex b){
        return new Complex(((a.real*b.real)-(a.imag*b.imag)),((a.real*b.imag)+(a.imag*b.real)));
    }

    public void printComplex(){
        if(real == 0 && imag!=0){
            System.out.println(imag+"i");
        }
        else if(imag == 0 && real!=0){
            System.out.println(real);
        }
        else{
            System.out.println(real+"+"+imag+"i");
        }
    }

}

class Ans{
    public static void main(String[] args){
        Scanner scn = new Scanner(System.in);
        System.out.println("Enter real part of complex number 1: ");
        int real1 = scn.nextInt();
        System.out.println("Enter complex part of complex number 1 without iota sign: ");
        int comp1 = scn.nextInt();
        System.out.println("Enter real part of complex number 2: ");
        int real2 = scn.nextInt();
        System.out.println("Enter complex part of complex number 2 without iota sign: ");
        int comp2 = scn.nextInt();
        Complex c = new Complex(real1, comp1);
        Complex d = new Complex(real2, comp2);
        Complex e = Complex.add(c,d);
        Complex f = Complex.diff(c,d);
        Complex g = Complex.product(c,d);
        e.printComplex();
        f.printComplex();
        g.printComplex();
    }
}
```

```
/Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bin/j
Enter real part of complex number 1:
4
Enter complex part of complex number 1 without iota sign:
5
Enter real part of complex number 2:
6
Enter complex part of complex number 2 without iota sign:
7
10+12i
-2+-2i
-11+58i


Process finished with exit code 0
```
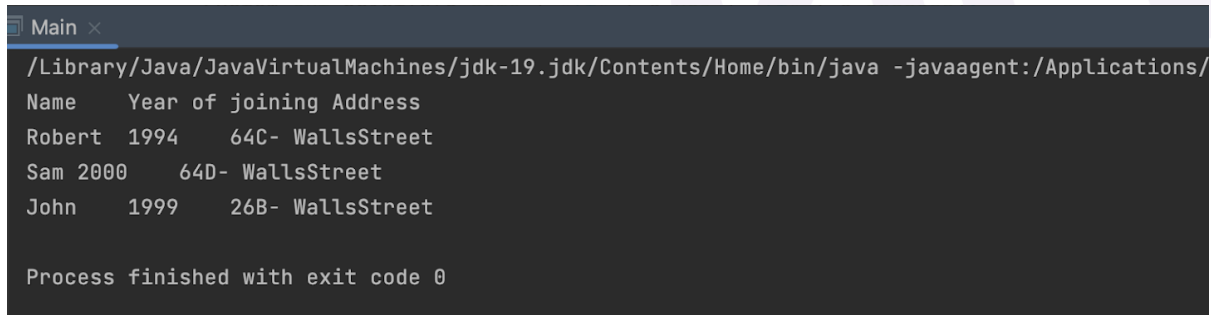
Q5. Write a program that would print the information (name, year of joining, salary, address) of three employees by creating a class named 'Employee'. The output should be as follows:

Name	Year of joining	Address
Robert	1994	64C- WallsStreet
Sam	2000	68D- WallsStreet
John	1999	26B- WallsStreet

Code:

```
class Employee{
    String name;
    int yoj;
    int salary;
    String address;
}
public class Test {
    public static void main(String[] args){
        Employee a = new Employee();
        a.name = "Robert";
        a.yoj = 1994;
        a.address = "64C- WallsStreet";
        Employee b = new Employee();
        b.name = "Sam";
        b.yoj = 2000;
        b.address = "64D- WallsStreet";
        Employee c = new Employee();
        c.name = "John";
        c.yoj = 1999;
        c.address = "26B- WallsStreet";
        System.out.println("Name" + "\t" + "Year of joining" + "\t" + "Address");
        System.out.println(a.name + "\t" + a.yoj + "\t" + a.address);
        System.out.println(b.name + "\t" + b.yoj + "\t" + b.address);
        System.out.println(c.name + "\t" + c.yoj + "\t" + c.address);
    }
}
```

```
Main ×
/Library/Java/JavaVirtualMachines/jdk-19.jdk/Contents/Home/bin/java -javaagent:/Applications/
Name    Year of joining Address
Robert  1994    64C- WallsStreet
Sam 2000    64D- WallsStreet
John    1999    26B- WallsStreet

Process finished with exit code 0
```