Ques 1: Add two complex numbers using call by reference.

import java.util.Scanner;

class Complexnumber {

    int real, imaginary;

    public Complexnumber(int real, int imaginary) {

        this.real = real;

        this.imaginary = imaginary;

    }

    void add(Complexnumber A) {

        this.real = A.real + this.real;

        this.imaginary = A.imaginary + this.imaginary;

    }

}

class Complex {

    public static void main(String[] args) {

        Scanner scn = new Scanner(System.in);

        int real, image;

        System.out.println("Enter first complex number");

        System.out.println("Enter real part");

        real = scn.nextInt();

        System.out.println("Enter imaginary part");

        image = scn.nextInt();

        Complexnumber A = new Complexnumber(real, image);

        System.out.println("Enter second complex number");

        System.out.println("Enter real part");

        real = scn.nextInt();

        System.out.println("Enter imaginary part");

        image = scn.nextInt();

        Complexnumber sum = new Complexnumber(real, image);

        A.add(sum);

        System.out.println("Sum of complex numbers :" + A.real + "+" + A.imaginary + "i");

        scn.close();

    }

}

-------------------------------------OUTPUT---------------------------------------------

Enter first complex number

Enter real part

2

Enter imaginary part

3

Enter second complex number

Enter real part

12

Enter imaginary part

15

Sum of complex numbers :14+18i

Ques 2: Demonstrate constructor chaining using this keyword.

import java.util.Scanner;

class Area {

    double areaofshape, a = -1, b = -1, c = -1, d = -1;

    String shape;

    int sides = -1;

    // this is for area of triangle and square

    public Area(double a) {

        this.a = a;

    }

    // this is for area of triangle with base and height and rectangle

    public Area(double a, double b) {

        this(a);

        this.b = b;

    }

    // this is for area of triangle with three sides given

    public Area(double a, double b, double c) {

        this(a, b);

        this.c = c;

    }

    public Area(double a, double b, double c, double d) {

        this(a, b, c);

        this.d = d;

    }

    void areaCount() {

        if (b == -1 || c == -1) {

            areaofshape = -1;

            shape = "Invalid";

        } else if (d == -1) {

            double s = a + b + c;

            s = s / 2;

            s = s \* (s - a) \* (s - b) \* (s - c);

            areaofshape = Math.sqrt(s);

            this.shape = "Triangle";

            this.sides = 3;

        } else {

            areaofshape = a \* b;

            this.sides = 4;

            if (a == b) {

                this.shape = "Square";

            } else {

                this.shape = "Rectangle";

            }

        }

    }

}

class Main {

    public static void main(String[] args) {

        int side;

        Scanner scn = new Scanner(System.in);

        System.out.println("Enter number of sides of the shape");

        side = scn.nextInt();

        if (side == 3) {

            double a, b, c;

            System.out.println("Enter sides of the triangle");

            a = scn.nextDouble();

            b = scn.nextDouble();

            c = scn.nextDouble();

            Area shape = new Area(a, b, c);

            shape.areaCount();

            System.out.println("Area of " + shape.shape + shape.areaofshape);

        } else if (side == 4) {

            int choice;

            System.out.println("Enter your choice\n 1)Square\n2) Rectangle");

            choice = scn.nextInt();

            if (choice == 1) {

                double x;

                System.out.println("Enter side of the square");

                x = scn.nextDouble();

                Area shape = new Area(x, x, x, x);

                shape.areaCount();

                System.out.println("Area of " + shape.shape + shape.areaofshape);

            } else if (choice == 2) {

                double x, y;

                System.out.println("Enter sides of the Rectangle");

                x = scn.nextDouble();

                y = scn.nextDouble();

                Area shape = new Area(x, y, x, y);

                shape.areaCount();

                System.out.println("Area of " + shape.shape + ":" + shape.areaofshape);

            } else {

                System.out.println("Invalid choice");

            }

        } else {

            System.out.println("Invalid shape");

        }

        scn.close();

    }

}

---------------------------------------OUTPUT------------------------------------------------

Enter number of sides of the shape

4

Enter your choice

1)Square

2) Rectangle

2

Enter sides of the Rectangle

2.345

8.9878

Area of Rectangle:21.076391