

OOP Assignment I

1. Write a Java program that reads a string from the keyboard, and passes the String object to a static method called ChangeCase() which will translate the case of letters and display the result in the main. If, for instance, the string "heLLo" is given, the output will be "HEllo"

```
import java.util.Scanner;
class ChangeCase {
    static String changeCase (String str) {
        String rev = "";
        for (int i = 0; i < str.length(); ++i) {
            char z = str.charAt(i);
            if (z > 64 && z < 91)
                rev += (char)(z + 32);
            else if (z > 96 && z < 123)
                rev += (char)(z - 32);
            else
                rev += z;
        }
        return rev;
    }
    public static void main (String [] args) {
        Scanner sc = new Scanner (System.in);
        System.out.print("Enter a gorrnam string: ");
        String str = sc.nextLine();
        System.out.println("\nAfter character reversal: " +
changeCase(str));
    }
}
```

2. Write a program which will accept an integer from the user and pass the value to a method called PrintNumberInWord that will print "ONE", "TWO",... , "NINE", "ZERO" if the integer variable "number" is 1, 2,... , 9, or 0, respectively using the " if-else-if ladder"

```
import java.util.Scanner;
class NumInWords {
    static void printNumberInWord (int n) {
        // Cause we've got to use the if-else-if ladder for the
        glory of Satan...
        if (n == 0)
            System.out.print("ZERO");
        else if (n == 1)
            System.out.print("ONE");
        else if (n == 2)
            System.out.print("TWO");
        else if (n == 3)
            System.out.print("THREE");
        else if (n == 4)
            System.out.print("FOUR");
        else if (n == 5)
            System.out.print("FIVE");
        else if (n == 6)
            System.out.print("SIX");
        else if (n == 7)
            System.out.print("SEVEN");
        else if (n == 8)
            System.out.print("EIGHT");
        else if (n == 9)
            System.out.print("NINE");
        else
            return;
    }
    public static void main (String [] args) {
        Scanner sc = new Scanner(System.in);
        System.out.print("Enter a number (0-9): ");
        int n = sc.nextInt();
        printNumberInWord(n);
    }
}
```

3. Write a main method that will read the matrix as input from the user and pass it to a method `isSkew` defined in the class `CheckSkew` to check if the matrix is skew symmetric or not.

```
import java.util.Scanner;
class CheckSkew {
    static boolean isSkew (int a[][]) {
        for (int i = 0; i < a.length; ++i)
            if (a[i][i] != 0)
                return false;
        return true;
    }
    public static void main (String [] args) {
        Scanner sc = new Scanner (System.in);
        System.out.print("Enter the order of the matrix: ");
        int n = sc.nextInt();
        int arr[][] = new int[n][n];
        System.out.print("There is no spoon.\nEnter the matrix:
");
        for (int i = 0; i < n; ++i)
            for (int j = 0; j < n; ++j)
                arr[i][j] = sc.nextInt();
        System.out.println("The inputted matrix is " +
(isSkew(arr)?"SKEW SYMMERTRIC":"NOT SKEW SYMMETRIC"));
    }
}
```

4. Define a class called AreaOverloading and write an overloaded method called computeArea which is used to compute the area of a triangle, a rectangle and a circle, respectively. Show the invocation of these methods in the main.

```
import java.util.Scanner;
class AreaOverloading {
    double computeArea (double radius) {
        return Math.PI*radius*radius;
    }
    double computeArea (double length, double breadth) {
        return length * breadth;
    }
    double computeArea (double sa, double sb, double sc) {
        double s = (sa + sb + sc)/2;
        return Math.sqrt(s * (s - sa) * (s - sb) * (s - sc));
    }
    public static void main (String [] args) {
        AreaOverloading ao = new AreaOverloading();
        System.out.println("Area of circle with radius 4.2 = " +
ao.computeArea(4.2));
        System.out.println("Area of rectangle with sides 7.5 and
11.4 = " + ao.computeArea(7.5, 11.4));
        System.out.println("Area of triangle with sides 12.2,
14.4 and 13.6 = " + ao.computeArea(12.2, 14.4, 13.6));
    }
}
```

5. Define a class called circle that contains:

- **Two private instance variables: radius (of type double) and color (of type String),**
- **Initialize the variables radius and color with default value of 1.0 and "red", respectively using default constructor.**
- **Include a second constructor that will use the default value for color and sets the radius to the value passed as parameter.**
- **Two public methods: getRadius() and getArea() for returning the radius and area of the circle**
- **Invoke the above methods and constructors in the main.**

```
import java.util.Scanner;
public class Circle {
    private double radius;
    private String color;
    public Circle() {
        this.radius = 0.0;
        this.color = "red";
    }
    public Circle(double radius) {
        this.radius = radius;
        this.color = "red";
    }
    public double getRadius() {
        return this.radius;
    }
    public double getArea() {
        return Math.PI * this.radius * this.radius;
    }
    public static void main(String [] args) {
        Circle c1 = new Circle();
        Circle c2 = new Circle(4.2);
        System.out.println("Radius of c1 = " + c1.getRadius());
        System.out.println("Area of c1 = " + c1.getArea());
        System.out.println("Radius of c2 = " + c2.getRadius());
        System.out.println("Area of c2 = " + c2.getArea());
    }
}
```