

1. Write a Java class, **Normalization**, that includes the following methods. Follow the comments (requirements) to complete all methods. **[total 12 points]**

```
import java.util.Arrays;
public class Normalization {

    // return the biggest elements of the input array, i.e., arr[] here.
    // do NOT use the java-built in function Math.max [2 points]
    public static double max(double[] arr){
        // your solutions start here
    }

    // return the smallest elements of the input array, i.e., arr[] here.
    // do NOT use the java-built in function Math.min [2 points]
    public static double min(double[] arr){
        // your solutions start here
    }

    // scaling the input array, i.e., arr[] here, so that each element is between 0 and 1
    // by subtracting the minimum value from each element
    // and then dividing each element by the difference
    // between the minimum and maximum values). [4 points]
    public static void scale(double[] arr){
        // your solutions start here
    }

    // get user's input and output the scaled array [4 points]
    public static void main(String[] args)
    {
        // ask user to enter some float-point or integer numbers
        // and put them into java array with type 'double'

        // then call the method 'scale'

        // then output the 'scaled' (or normalized) array.

    }
}
```

2. Complete the codes for the class CreditCard, whose source file CreditCard.java can be downloaded from Sakai. **[10 points]**

3. Tic-Tac-Toe is a game played in a three-by-three board. Two players—X and O—alternate in placing their respective marks in the cells of this board, starting with player X. If either player succeeds in getting three of his or her marks in a row, column, or diagonal, then that player win. Complete the java program, TicTacToe.java, that is downloadable from Sakai, so that it outputs (prints) the pattern shown on the right. **[5 points]**

```
O|X|O
---
O|X|X
---
X|O|X
Tie
```