CS163/164: Worksheet Week 6 – ArrayLists
Name(s):_____

1. Analyze the code below and write the exact output of this program if we run it.

```
import java.util.ArrayList;
public class W6Activity1 {
    public static void main(String[] args){
        ArrayList<String> list_Strings = new ArrayList<>();
        list_Strings.add("Red");
        list_Strings.add("Green");
        list_Strings.add("Orange");
        list_Strings.add("White");
        list_Strings.add("Black");
        System.out.println(list_Strings);
        list_Strings.remove(1);
        list_Strings.remove("White");
        list_Strings.add(2, "Pink");
        for(int i = 0; i < list_Strings.size(); i++){
            System.out.println("Index: " + i + " Element: " + list_Strings.get(i));
        }
    }
```

2. Identify instance variables and explain the methods in class W6Activity2.

```
import java.util.ArrayList;
import java.util.Scanner;
public class W6Activity2 {
    private ArrayList<Double> lst;
    private int capacity;
    public W6Activity2(int capacity){
        if(capacity < 10) capacity = 10;
        lst = new ArrayList<>(capacity);
        this.capacity = capacity;
    }
    public boolean readAndAdd(Scanner in){
        System.out.println("Enter the quantity of numbers to read");
        int quantity = in.nextInt();
        if(quantity < (lst.size() + capacity)){
            for(int i = 0; i < quantity; i++){
                System.out.println("Enter a double number:");
                double num = in.nextDouble();
                lst.add(num);
            }
            return true;
        }
        return false;
    }
    public int size(){
        return lst.size();
    }
    public int getCapacity(){
        return capacity;
    }
    public String toString(){
        String msg = "";
        for(Double element: lst){
            msg += element + " ";
        }
        msg += "\n";
        return msg;
    }
}
```

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3. Analyze the code below and write the exact output of this program if we run it with the following entries for the readAndAdd method: 3, 1.5, 2.4, 6.

```
import java.util.Scanner;
public class AppW6Activity2 {
    public static void main(String args[]){
        Scanner in = new Scanner(System.in);
        W6Activity2 w6 = new W6Activity2(4);
        System.out.println(w6.size());
        System.out.println(w6.getCapacity());
        if(w6.readAndAdd(in))
            System.out.println("Number successful added!");
        else System.out.println("Not possible to insert more numbers!");
        System.out.println(w6.size());
        System.out.println(w6.getCapacity());
        System.out.println(w6.toString());
    }
}
```

4. Write the following methods for the W6Activity2 class:
    a. A method that finds and returns the maximum value stored in the Arraylist.
    b. A method that finds and return the index where the minimum value is stored in the ArrayList.
    c. A method that returns the sum of all elements in the ArrayList.
    d. A method that returns the average of all elements in the ArrayList.
    e. A method that returns a list with elements that are less than the average of all elements in the ArrayList.

Before you code those methods think about how you are going to solve each one of those problems. Write your algorithm in English first, then translate your algorithm to a Java method.

5. In the main method of class App W6Activity2, write one method call for each method you created previously in question 4.