A7 (30 marks)

***Focus**: single dimensional arrays, passing arrays to methods*

Q1. [10 marks] Produce a method that reads in a set of values (double) from the user and returns them. Use this header:

```
public static double[] getNumsFromUser(String msg1, String msg2)
```

The implementation of the method should start with a message to input the total number of array elements, followed by a message to enter all the array elements. The method returns the array of elements. The two strings msg1 and msg2 that are passed to the method as parameters will be the two messages that tell the user what to do.

In the main class, use the following program outline to test this method:

```
public class Q1 {
 public static void main(String[] args) {
      String s1 = "Enter number of students: ";
      String s2 = "Enter student grades: ";
      double[] numbers = getNumsFromUser(s1, s2);
      System.out.println(Arrays.toString(numbers));
 }
 public static double[] getNumsFromUser(String msg1, String msg2){
      //your code goes here
 }
}
```

Sample run

```
Enter number of students: 4
Enter student grades: 12.5 23 11.5 27
[12.5, 23.0, 11.5, 27.0]
```

Q2. [10 marks] Create a complete program that uses the getNumsFromUser( ) method in Q1 to read in student marks (double) from the user, determines the highest mark, then ranks students based on how their mark compares to the highest mark, and displays their mark and letter grade. Use the following system of subtracting the student's mark from the highest mark to determine their letter grade.

Mark	mark ≥ best - 10	mark ≥ best - 20	mark ≥ best - 30	mark ≥ best - 40	otherwise
Grade	A	B	C	D	F

You MAY write all your code for this question, along with the call for getNumsFromUser( ), inside the main method. However, if you choose to write a method for this code and call it in the main method, you may use this header:

```
public static void showLetterGrades(double[] grades)
```

Sample run

```
Enter number of students: 4
Enter student grades: 67 93 55 78
Student 1 score is 67.0 and grade is C
Student 2 score is 93.0 and grade is A
Student 3 score is 55.0 and grade is D
Student 4 score is 78.0 and grade is B
```

Q3. [10 marks] Create a method that accepts a double array as a parameter and returns true if the values in the array are sorted in increasing order. Using this header:

```
public static boolean isSorted(double[] list)
```

In the main method, write test code that gets the user to enter a series of numbers using the getNumsFromUser( ) method in Q1, then use the isSorted( ) method to determine if the user's numbers are sorted.

Sample run

```
How many numbers in the list? 5
Enter the list: 4 5 7 9 10
The list is already sorted
```

```
How many numbers in the list? 5
Enter the list: 2 4 6 4 9
The list is not sorted
```

Submission Instructions

For this assignment, you need to do the following:

1- Create a Java project of which name consists of **your student number followed by the assignment number,** e.g., "1234567_A1".
2- Create one class for each question and write your answer inside that class. Your classes should have the same name as the question number (e.g., Q1)
3- After solving all questions, open Windows Explorer (or any other file explorer).
4- Navigate to your Java project folder (can be found inside your Eclipse workspace folder).
5- Locate the "src" folder for this project (the folder that includes the source code for all questions).
6- Zip the "src" folder and rename the zipped file to match your project name (e.g., 1234567_A1.zip).
7- Submit the zipped file **to Canvas.**

Note that you can resubmit an assignment, but the new submission overwrites the old submission and receives a new timestamp.