CoSc 10403

Lab # 6 (An Array as a Collection)

Due Date:

Part I, Experiment – classtime, Thursday April 16th 2020

Part II, Program - by midnight, Thursday April 16th 2020

Part I is the Experiment component and <u>will not be accepted late</u>. Part II is the programming component.

Part I. Experiment. (20%)

REMEMBER - ALL EXPERIMENTS MUST BE TYPED – NOT HANDWRITTEN!!!!

1. Take a look at **Lab6ExperimentView.java,** by looking at method **addPanel**(), what does the if statement **if(validateInt(dataN.getText()))** do?
2. Again in **Lab6ExperimentView.java,** by looking at method **validateInt(String s),** what does the method return? What decision is made based on the return by the calling method?
3. Finally in **Lab6ExperimentView.java,** by looking at method **addPanel**(), what is the use of the line **int dataR = (int) numData/5+1;** What is the benefit in the GridLayout where it is used?
4. Take a look at **Lab6ExperimentControl.java,** by looking at method **procMax()** What does the if statement block do? What is the use of the assignment `maxIndex = i`?
5. Take a look at **Lab6ExperimentControl.java,** compare the methods **procSort**() and **procSortString**(). What is the difference between the if statements in both methods, specifically: **if(data[j-1]>data[j])** and **if(dataString[j-1].compareTo(dataString[j])>0)** ?

6. Take a look at **Lab6ExperimentView.java,** look at the declaration **DecimalFormat decimal = new DecimalFormat("###,###.##");**
   Where in the program the decimal instance is used? What for?

<u>Part II (80%)</u> –As with earlier projects, you can zip together the two **Lab6** java files (i.e. Lab6View.java, Lab6.java), before submitting your classes with D2L or simply submit **Lab6.java** that extends **Lab6View.java**.

This project will require that your **Lab6Project** contain two separate classes (**Lab6View**, **Lab6**) since the emphasis is the Control, we give you Lab6View.java and you only need to write the Lab6.java.

The purpose of this assignment is to familiarize you with a **Collection** Class to implement a **One-Dimensional Array.** We will discuss in class how to do this project. The functionality of this lab is as follows:

1) **When number of elements of two one dimensional arrays are defined the arrays are displayed for the user to enter the number in the JTextFields**

2) **After entering valid numbers in the JTexFields the arrays can be read and parsed to be stored in proper data double array collections**

3) **Once the arrays are read you can perform the following three operation**

   Addition   Vector data2 is added to vector data displaying the results in vector data, this is done using a for loop for each element

   Scalar   The scalar or dot operation of the two vector is computed and the result is displayed in a new JFrame the formula of this computation is given by the summation scalar = ∑ data[i]*data2[i] for all elements i in both vectors data and data2

   Matrix   The matrix operation of the two vectors is computed and the result is displayed in a new JFrame the formula of this computation is given by the summation result[i][j] =   data[i]*data2[j] for all elements i in the vector data and j in vector data2
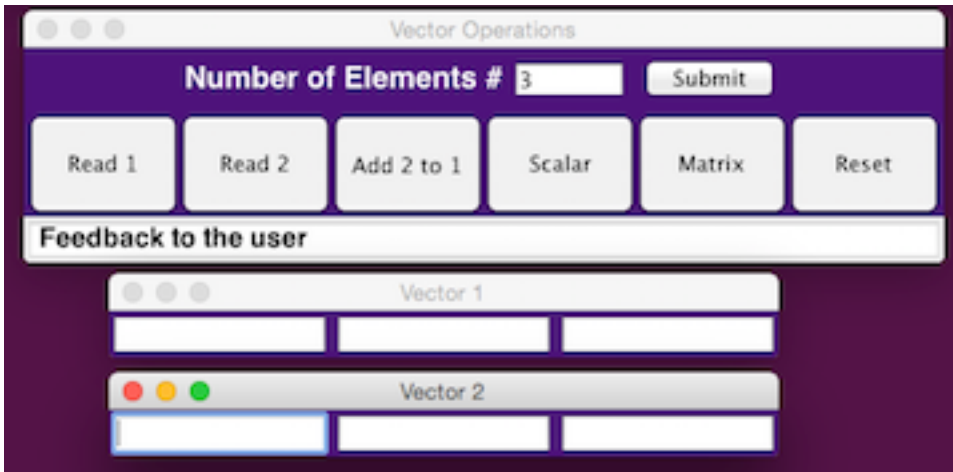
4) **A Reset button is also available**

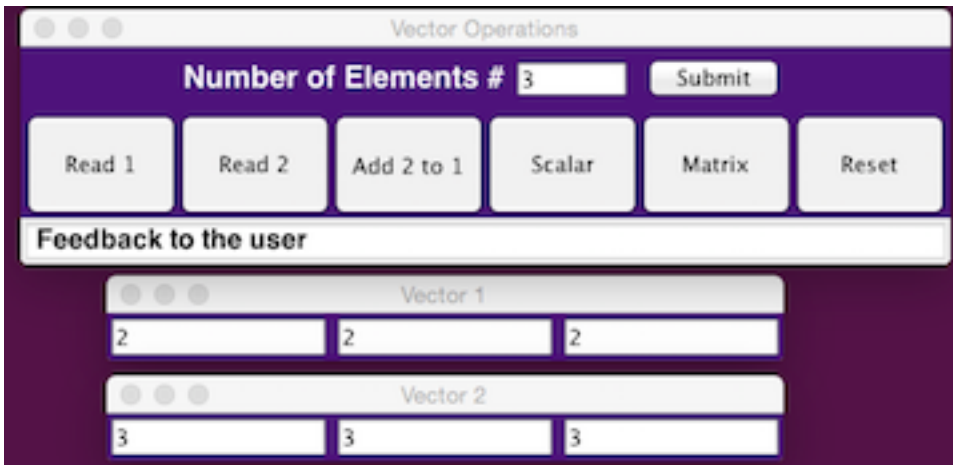   **Here is a sample of our implementation**

   Before defining number of elements
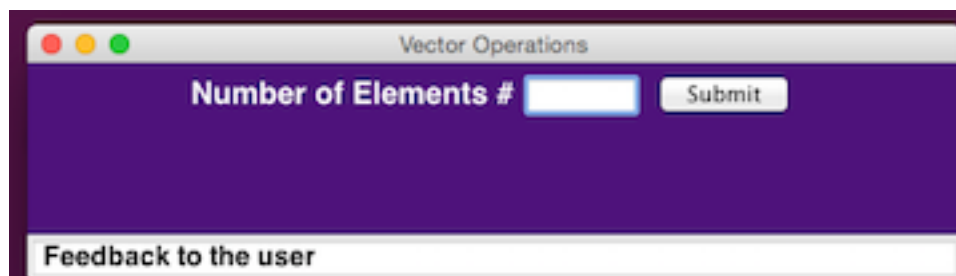
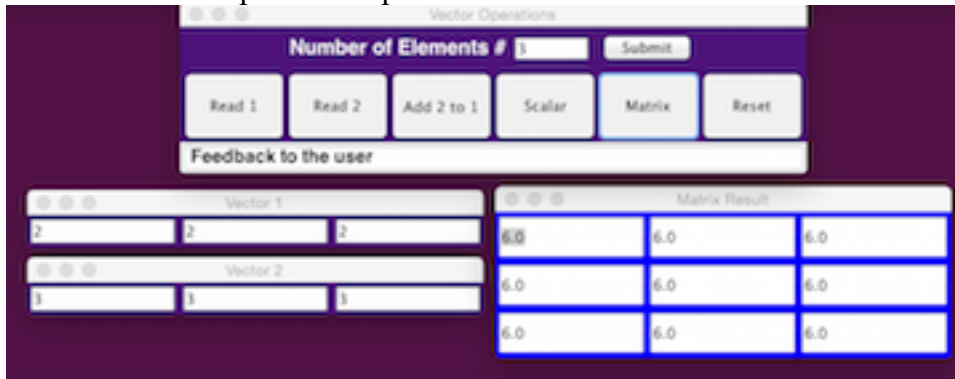   **After number of elements are defined**

After vectors data is entered and vectors are read

After the scalar operation is performed

After the Matrix operation is performed

Note that the program may consider **try/catch** blocks to process when and **NumberFormatException**s, but they are not required yet.

NullPointerExceptions occur