CPT120 Introduction to Programming
Assignment 3 (Java)
Due before 9pm, 20/11/2011

[Spec updated 20/10/2011]

Description

Your task is to write a program that reads in an arbitrary number of integer data values in to an array and then produces some output based on this data. You must use the provided start-up code (see Blackboard).

More specifically, after the data is read, the program must report the minimum and the maximum values entered, which data items contained these two values and then finally a bar graph that visualises all the entered data.

For example, consider the following run of the program. (User inputs are in *underlined italic font*):

```
Enter number of data items to graph: 3

Enter value for data item 0: 9
Enter value for data item 1: 5
Enter value for data item 2: 20

Minimum value is 5 and it was (first) found in data item 1
Maximum value is 20 and it was (first) found in data item 2

0: *********
1: *****
2: ********************
```

The provided start-up code already has the implementation of the first line ("enter number of data items to graph:") and it creates the array with the user specified number of elements. The name of the array is **`array`** and the number of elements (e.g. 3, in the above example) is stored in an integer variable named **`arraySize`**. Both of which you will need to use in your code.

Your code and changes to code must only be within the following two methods:

`readDataInToArray():`

This method takes in all the input and does not perform any other tasks.

`computeAndDisplayGraph():`

This method will perform the minimum/maximum finding and then display the graph.

Here is another example run of the program:

```
Enter number of data items to graph: 5

Enter value for data item 0: 9
Enter value for data item 1: 0
Enter value for data item 2: 2
Enter value for data item 3: 1
Enter value for data item 4: 0

Minimum value is 0 and it was (first) found in data item 1
Maximum value is 9 and it was (first) found in data item 0

0: *********
1:
2: **
3: *
4:
```

In the above, note how there are two minimum values (data items 1 and 4) but, as the message suggests, only the first (data item 1) is reported. The same applies to the maximum, if there were multiple data items with the same values.

Also note how the bars are not drawn for data items with 0 values.

Some Requirements Specific to this Assignment

1. The provided start-up code must be used. The start-up code is named Assignment3-startup.java and it needs to be renamed to Assignment3.java. The start-up code can be compiled and run as is.
2. Do not validate any inputs. Assume the value inputs will only be integers that are 0 or greater. The number of data items (array size) will always be 1 or more.
3. For reading keyboard inputs, the `readInt()` function that is already implemented in the start-up code should be used. For the purposes of this assignment it works the same way as the `readInt()` function in `ConsoleReader`. Therefore you must not use any other classes/objects (e.g. `ConsoleReader`) or functions to obtain the necessary inputs.
4. You can only modify the contents of `readDataInToArray()` and `computeAndDisplayGraph()` methods. Do not make changes in any other part of the program.
5. The array's size should only be accessed through the `arraySize` variable. (E.g. do not use `array.length`).
6. You must ensure that your program's output is identical to that of the example runs shown here. E.g. your program must also produce newlines in the exact locations shown in the example runs here.

Some General Requirements

7. As it was the case with the previous assignments in this unit, it is a requirement that you follow the relevant Blackboard discussion group for any possible future clarifications/changes. It is also a requirement to ask Gayan, when in doubt before making assumptions.
8. Unless otherwise stated, you will not need to know topics that are not covered in this course.
9. Whenever you wish to implement some feature, always ask yourself two questions: (1) is this a part of the requirement? (2) Is this going to make the program easier for someone else to maintain (i.e. to understand and make changes)?
10. Please submit your files on a timely manner. It is the student's responsibility to manage the risks involved in submitting the files correctly.

Submission Details

This is an individual assignment and all submitted work must be your own. Please do not use other people's code or allow others to use your code. RMIT follows strict anti-plagiarism policies.

Submission is through WebLearn (http://www.rmit.edu.au/learninghub) and you must submit only your Assignment3.java file. Do not submit any other files. Submission of any other file (e.g. Assignment3.class) will result in 0 marks for this assignment. After submitting, please check your RMIT student email for the submission confirmation email.

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