

Introduction

The goal of the second week's lab is to create a "RandomIntegerContainer" class that contains an Array List of random integers. In this class, the methods included are:

- addToFront: receives an integer and add that integer as an additional element at the end of the list.
- addToBack: receives an integer and add that integer as an additional element at the beginning of the list.
- addSorted: receives an integer, assuming the list is already sorted, add that integer into the list in a way that keeps the list sorted.
- SelectionSort: sort the list in an ascending order.
- ProductSort: receives an integer and multiply that with the first element of the list, then add that product into a position that keeps the list sorted.

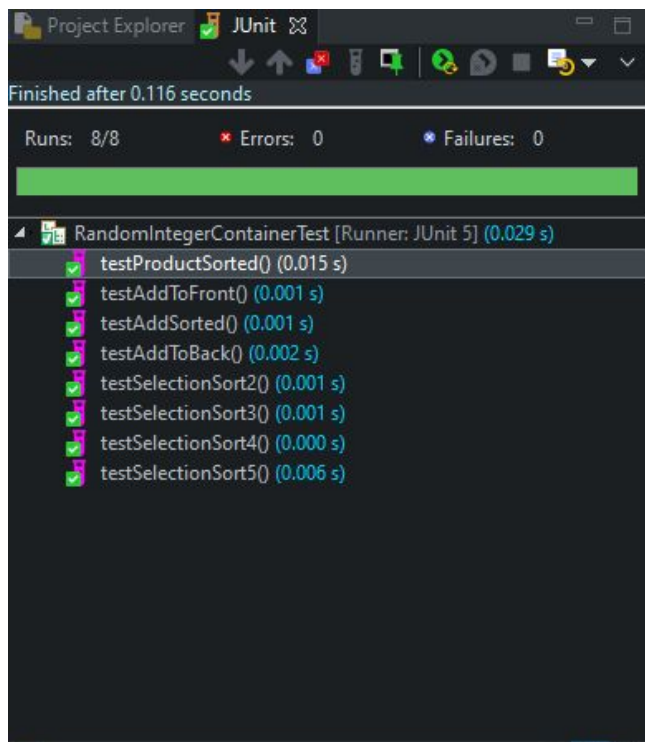
The second goal of the lab is to create a benchmarking Experiment Controller class that runs tests in different sizes on the methods in the RandomIntegerClass and measure the duration.

The third goal of the lab is to create a JUnit class to test all the methods included in the RandomIntegerContainer class.

Unit Testing

Test performed:

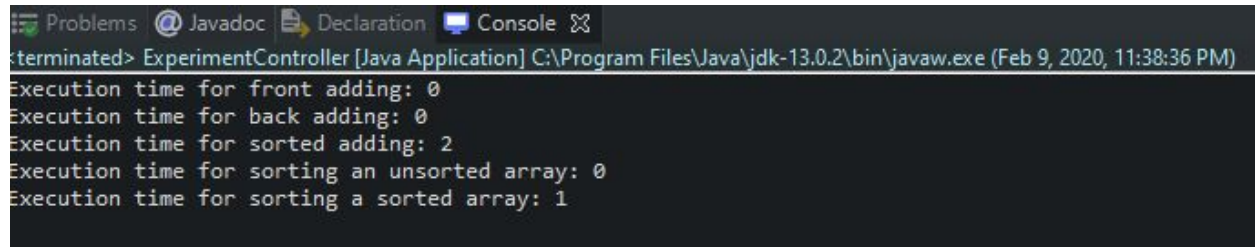
- Test case 1: positive (100,65,1,0)
- Test case 2: negative and positive (-31,-32,0,32,333)
- Test case 3: negative (-600,-1,-2,-99)
- Test case 4: all equal (8,8,8,8)
- Test case 5: double equalities (44,44,-9,-9)



Tests 2 to 5 were performed on SelectionSort but not on other method

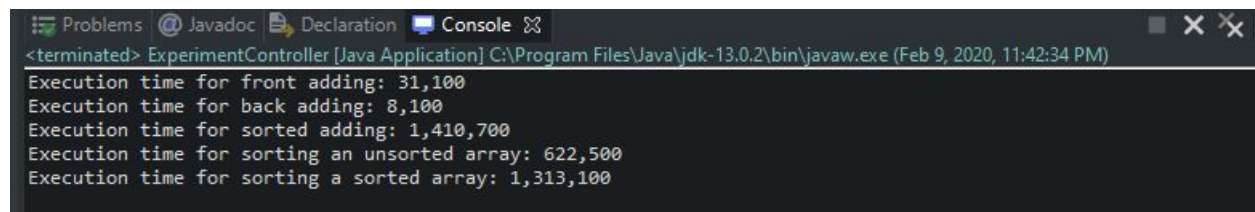
Required output

The outputs required from the lab were the time each method took to run.



```
Problems Javadoc Declaration Console
<terminated> ExperimentController [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Feb 9, 2020, 11:38:36 PM)
Execution time for front adding: 0
Execution time for back adding: 0
Execution time for sorted adding: 2
Execution time for sorting an unsorted array: 0
Execution time for sorting a sorted array: 1
```

Execution time in milliseconds



```
Problems Javadoc Declaration Console
<terminated> ExperimentController [Java Application] C:\Program Files\Java\jdk-13.0.2\bin\javaw.exe (Feb 9, 2020, 11:42:34 PM)
Execution time for front adding: 31,100
Execution time for back adding: 8,100
Execution time for sorted adding: 1,410,700
Execution time for sorting an unsorted array: 622,500
Execution time for sorting a sorted array: 1,313,100
```

Execution time in nanoseconds

Trouble Report

The lab experimenter did not succeed to complete the following:

- Produce data visualization for the ExperimentController class with different sizes of input
- The IDE used was Eclipse due to some compatibility issues in installing BlueJ
- Not all of the tests were run for all of the methods

References

ArrayList (Java Platform SE 8). (n.d.). Retrieved February 9, 2020, from <https://docs.oracle.com/javase/8/docs/api/java/util/ArrayList.html>

java.time (Java Platform SE 8). (n.d.). Retrieved February 9, 2020, from <https://docs.oracle.com/javase/8/docs/api/java/time/package-summary.html>

Random (Java Platform SE 8). (n.d.). Retrieved February 9, 2020, from <https://docs.oracle.com/javase/8/docs/api/java/util/Random.html>

Selection sort java ---- Flower Brackets ---- code here. (2017, March 13). *Flower Brackets*. <https://www.flowerbrackets.com/selection-sort-java/>