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Program Structures & Algorithms

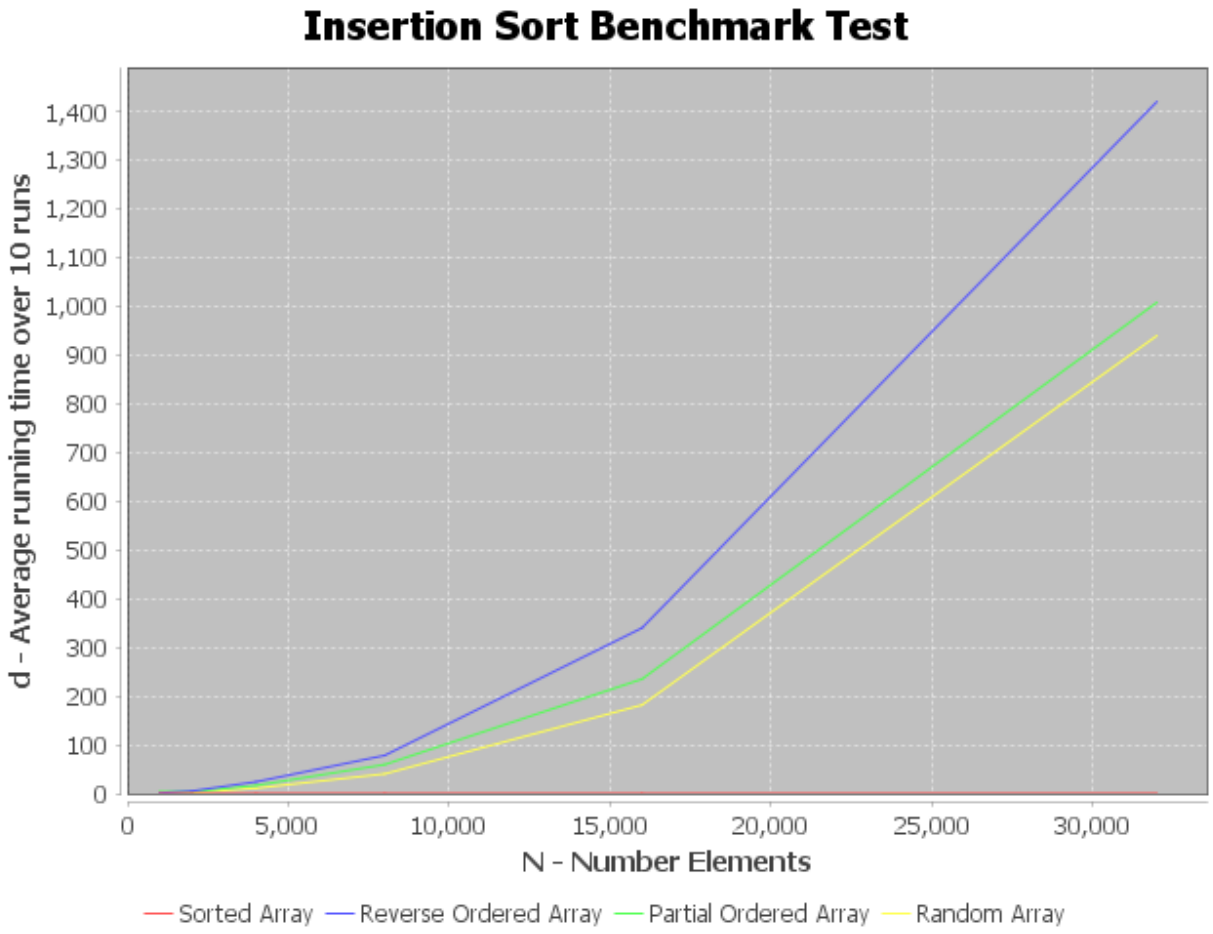
Fall 2021

Assignment No. 2

1. Tasks Performed

1. Implement the functions for *Timer.java*, run unit tests for *TimerTest* using modified values for the average running time.
2. Implement the InsertionSort algorithm in the *InsertionSort* class and use the *Helper* class.
3. Added a Unit test for insertion sort to *BenmarkTimerTest*
4. Added a main method to insertion sort to perform a doubling benchmark test.

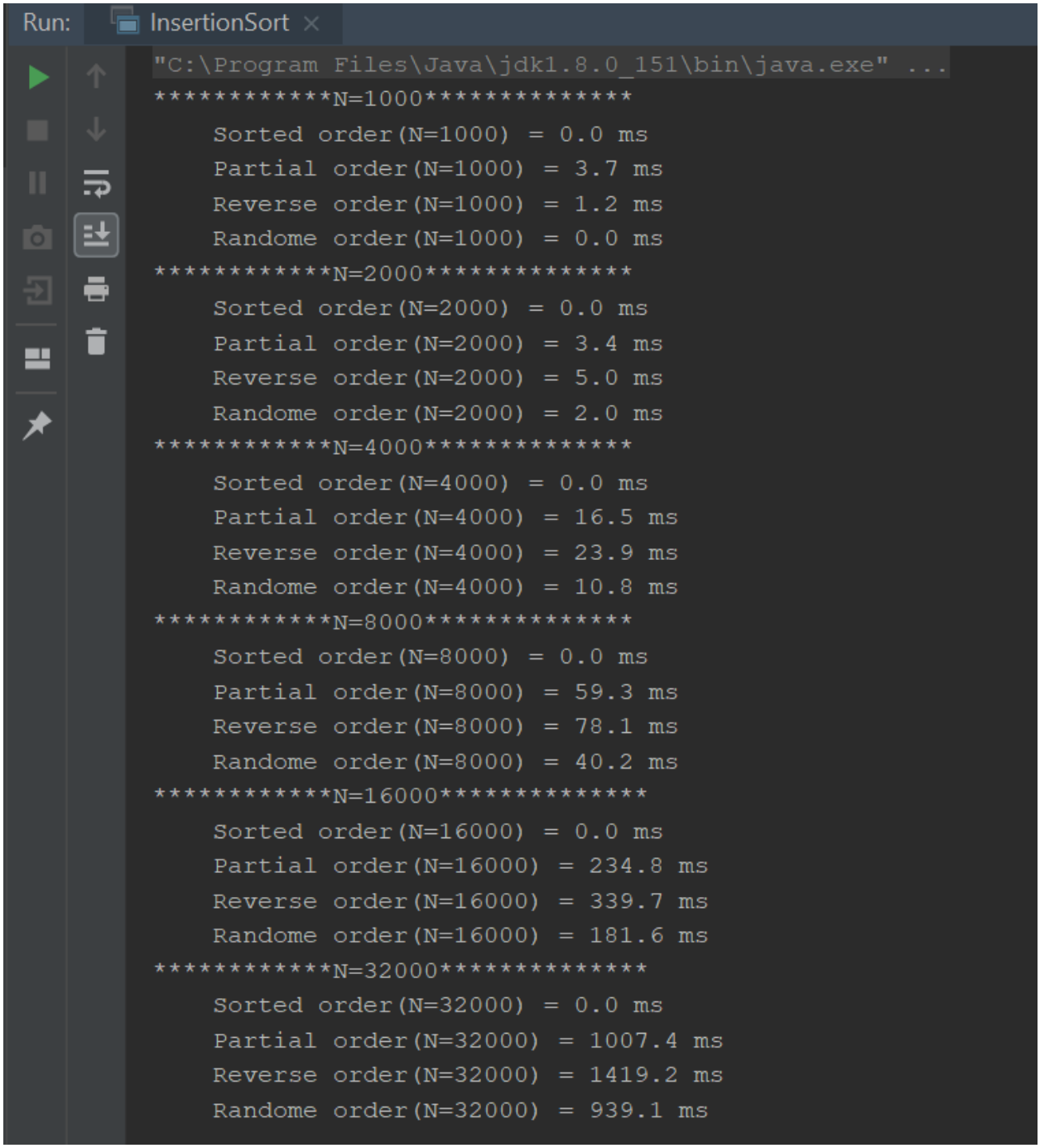
2.Observation



Based on the graph seen we can infer that for a random ordering where the expected running time of InsertionSort is O(N^2) is matching closely to the observed running time.

3. **Output**

Main Function in InsertionSort.java

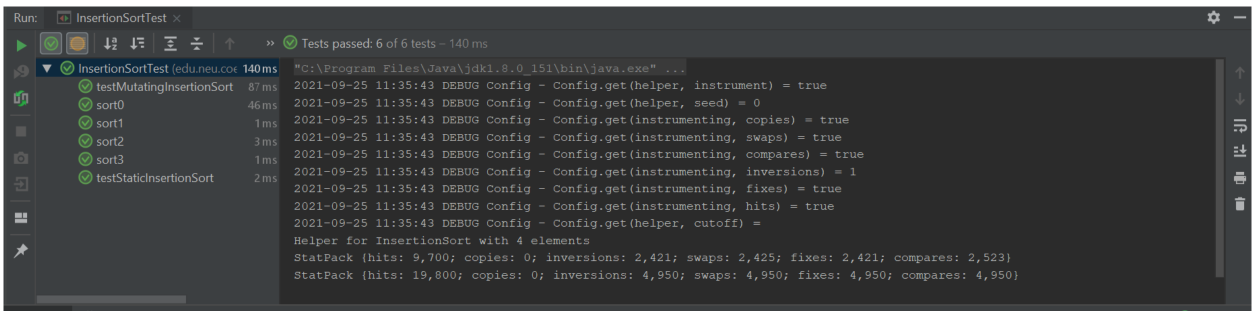


4. **Unit Tests**

TimerTest

Note: Delta values needed to be modified for the tests to work, this is due to differences in wait times depending on the thread pool configuration.(Only for TimerTest)

InsertionSortTest



BenchmarkTest