

David Nallapu (001530978)

Program Structures & Algorithms

Spring 2021

Assignment No. 2

- **Task**

Benchmarking of Insertion sort for random, arranged, partially arranged and reverse order arrays

- **Conclusion:**

Insertion Sort takes the most time with reverse order as we can see. This is due to the fact that it'll swap every time as nothing is in order. After that a random array of integers takes the most time, followed by partially arranged. The arranged array hardly took any time.

- **Evidence to support the conclusion:**

```
Console
<terminated> Benchmark_Timer [Java Application] /Library/Internet Plug-Ins/JavaAppletPlugin.plugin/Contents/Home

n: 2500
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: randomSort with 10 runs
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: arrangedSort with 10 runs
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: reverseSort with 10 runs
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: partialSort with 10 runs
Random: 7.1
Arranged: 0.0
Reverse: 13.1
Partial: 3.4

n: 5000
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: randomSort with 10 runs
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: arrangedSort with 10 runs
2021-02-03 23:24:46 INFO Benchmark_Timer - Begin run: reverseSort with 10 runs
2021-02-03 23:24:47 INFO Benchmark_Timer - Begin run: partialSort with 10 runs
Random: 30.4
Arranged: 0.0
Reverse: 64.6
Partial: 18.7

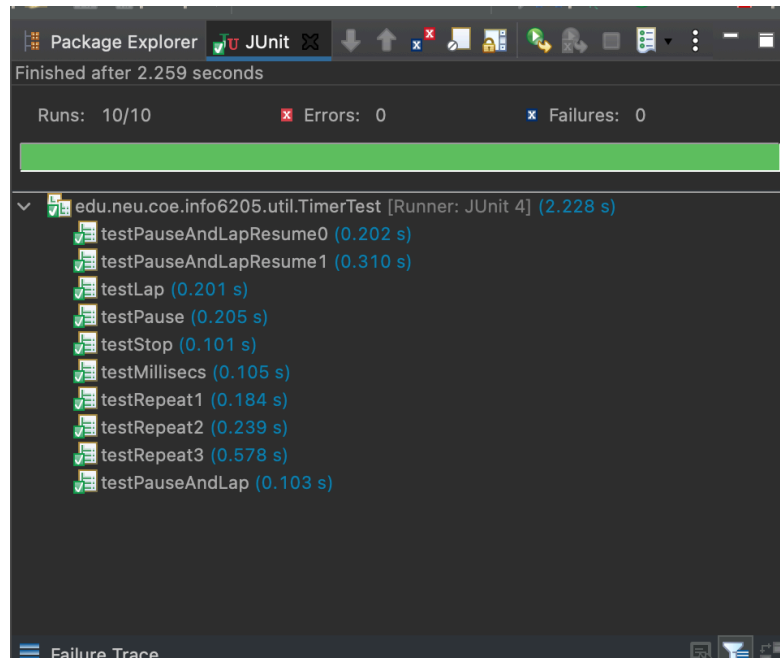
n: 10000
2021-02-03 23:24:47 INFO Benchmark_Timer - Begin run: randomSort with 10 runs
2021-02-03 23:24:49 INFO Benchmark_Timer - Begin run: arrangedSort with 10 runs
2021-02-03 23:24:49 INFO Benchmark_Timer - Begin run: reverseSort with 10 runs
2021-02-03 23:24:52 INFO Benchmark_Timer - Begin run: partialSort with 10 runs
Random: 147.2
Arranged: 0.1
Reverse: 200.9
Partial: 48.3

n: 20000
2021-02-03 23:24:52 INFO Benchmark_Timer - Begin run: randomSort with 10 runs
2021-02-03 23:24:57 INFO Benchmark_Timer - Begin run: arrangedSort with 10 runs
2021-02-03 23:24:57 INFO Benchmark_Timer - Begin run: reverseSort with 10 runs
2021-02-03 23:25:07 INFO Benchmark_Timer - Begin run: partialSort with 10 runs
Random: 398.0
Arranged: 0.1
Reverse: 825.8
Partial: 209.7

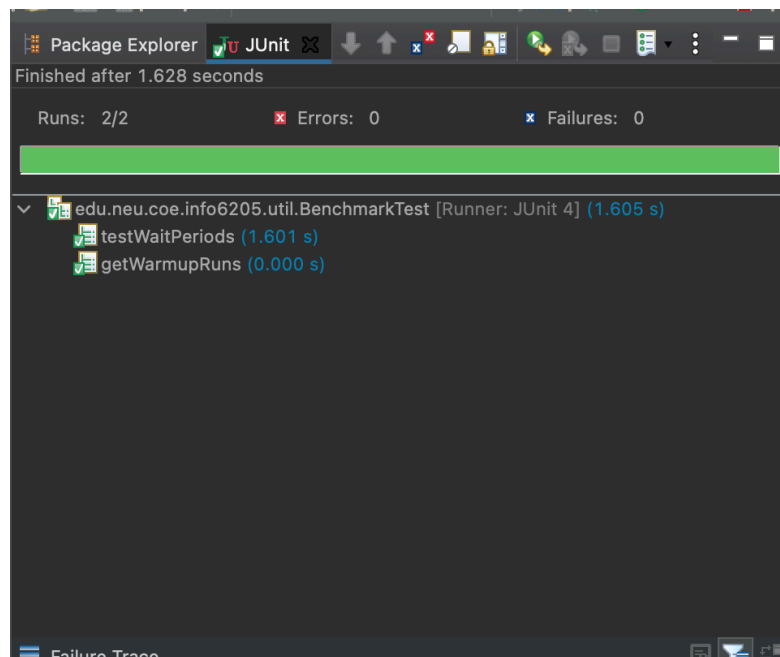
n: 40000
2021-02-03 23:25:09 INFO Benchmark_Timer - Begin run: randomSort with 10 runs
2021-02-03 23:25:34 INFO Benchmark_Timer - Begin run: arrangedSort with 10 runs
2021-02-03 23:25:34 INFO Benchmark_Timer - Begin run: reverseSort with 10 runs
2021-02-03 23:26:21 INFO Benchmark_Timer - Begin run: partialSort with 10 runs
Random: 2055.5
Arranged: 0.3
Reverse: 3905.8
Partial: 985.2
```

- Unit tests result:

Timer Test



Benchmark Test



Insertion Sort Test

