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**INFO 6205 – Fall 2021**

**Assignment - 2**

**Task:**

* To implement three methods of a class called Timer and check our implementation by running the unit tests in BenchmarkTest and TimerTest.
* To implement Insertion Sort code and run the unit tests in InsertionSortTest.
* Implement a main program to run the following benchmarks: measure the running times of this sort, using four different initial array ordering situations: random, ordered, partially ordered and reverse-ordered.

**Findings:**

**For n = 2000**

2021-09-27 01:49:31 INFO Benchmark\_Timer - Begin run: Insertion sort for partially sorted array of size: 2000 with 5 runs

4.4 ms

2021-09-27 01:49:31 INFO Benchmark\_Timer - Begin run: Insertion sort for reversely sorted array of size: 2000 with 5 runs

9.2 ms

2021-09-27 01:49:31 INFO Benchmark\_Timer - Begin run: Insertion sort for sorted array of size: 2000 with 5 runs

0.0 ms

2021-09-27 01:49:31 INFO Benchmark\_Timer - Begin run: Insertion sort for random numbers in a array of size: 2000 with 5 runs

5.0 ms

**For n = 4000**

2021-09-27 01:50:32 INFO Benchmark\_Timer - Begin run: Insertion sort for partially sorted array of size: 4000 with 5 runs

5.0 ms

2021-09-27 01:50:32 INFO Benchmark\_Timer - Begin run: Insertion sort for reversely sorted array of size: 4000 with 5 runs

41.6 ms

2021-09-27 01:50:33 INFO Benchmark\_Timer - Begin run: Insertion sort for sorted array of size: 4000 with 5 runs

0.2 ms

2021-09-27 01:50:33 INFO Benchmark\_Timer - Begin run: Insertion sort for random numbers in a array of size: 4000 with 5 runs

15.2 ms

**For n = 8000**

2021-09-27 01:51:11 INFO Benchmark\_Timer - Begin run: Insertion sort for partially sorted array of size: 8000 with 5 runs

16.2 ms

2021-09-27 01:51:11 INFO Benchmark\_Timer - Begin run: Insertion sort for reversely sorted array of size: 8000 with 5 runs

109.6 ms

2021-09-27 01:51:12 INFO Benchmark\_Timer - Begin run: Insertion sort for sorted array of size: 8000 with 5 runs

0.2 ms

2021-09-27 01:51:12 INFO Benchmark\_Timer - Begin run: Insertion sort for random numbers in a array of size: 8000 with 5 runs

47.6 ms

**For n = 16000**

2021-09-27 01:53:05 INFO Benchmark\_Timer - Begin run: Insertion sort for partially sorted array of size: 16000 with 5 runs

64.6 ms

2021-09-27 01:53:05 INFO Benchmark\_Timer - Begin run: Insertion sort for reversely sorted array of size: 16000 with 5 runs

335.8 ms

2021-09-27 01:53:08 INFO Benchmark\_Timer - Begin run: Insertion sort for sorted array of size: 16000 with 5 runs

0.8 ms

2021-09-27 01:53:08 INFO Benchmark\_Timer - Begin run: Insertion sort for random numbers in a array of size: 16000 with 5 runs

189.0 ms

**For n = 32000**

2021-09-27 01:53:56 INFO Benchmark\_Timer - Begin run: Insertion sort for partially sorted array of size: 32000 with 5 runs

177.2 ms

2021-09-27 01:53:58 INFO Benchmark\_Timer - Begin run: Insertion sort for reversely sorted array of size: 32000 with 5 runs

1318.4 ms

2021-09-27 01:54:08 INFO Benchmark\_Timer - Begin run: Insertion sort for sorted array of size: 32000 with 5 runs

0.4 ms

2021-09-27 01:54:08 INFO Benchmark\_Timer - Begin run: Insertion sort for random numbers in a array of size: 32000 with 5 runs

805.8 ms

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| N | Sorted | Partial Sorted | Random Sorted | Reverse Sorted |
| 2000 | 0 | 4.4 | 5 | 9.2 |
| 4000 | 0.2 | 5 | 15.2 | 41.6 |
| 8000 | 0.2 | 16.2 | 47.6 | 109.6 |
| 16000 | 0.8 | 64.6 | 189 | 335.8 |
| 32000 | 0.4 | 177.2 | 805.8 | 1318.4 |

**Graph:**

**Output/Tests Screenshots:**

A screenshot of a computer

Description automatically generated with medium confidence

A screenshot of a computer

Description automatically generated

A screenshot of a computer

Description automatically generated