Program Structure and Algorithms
Assignment - 2 Benchmark

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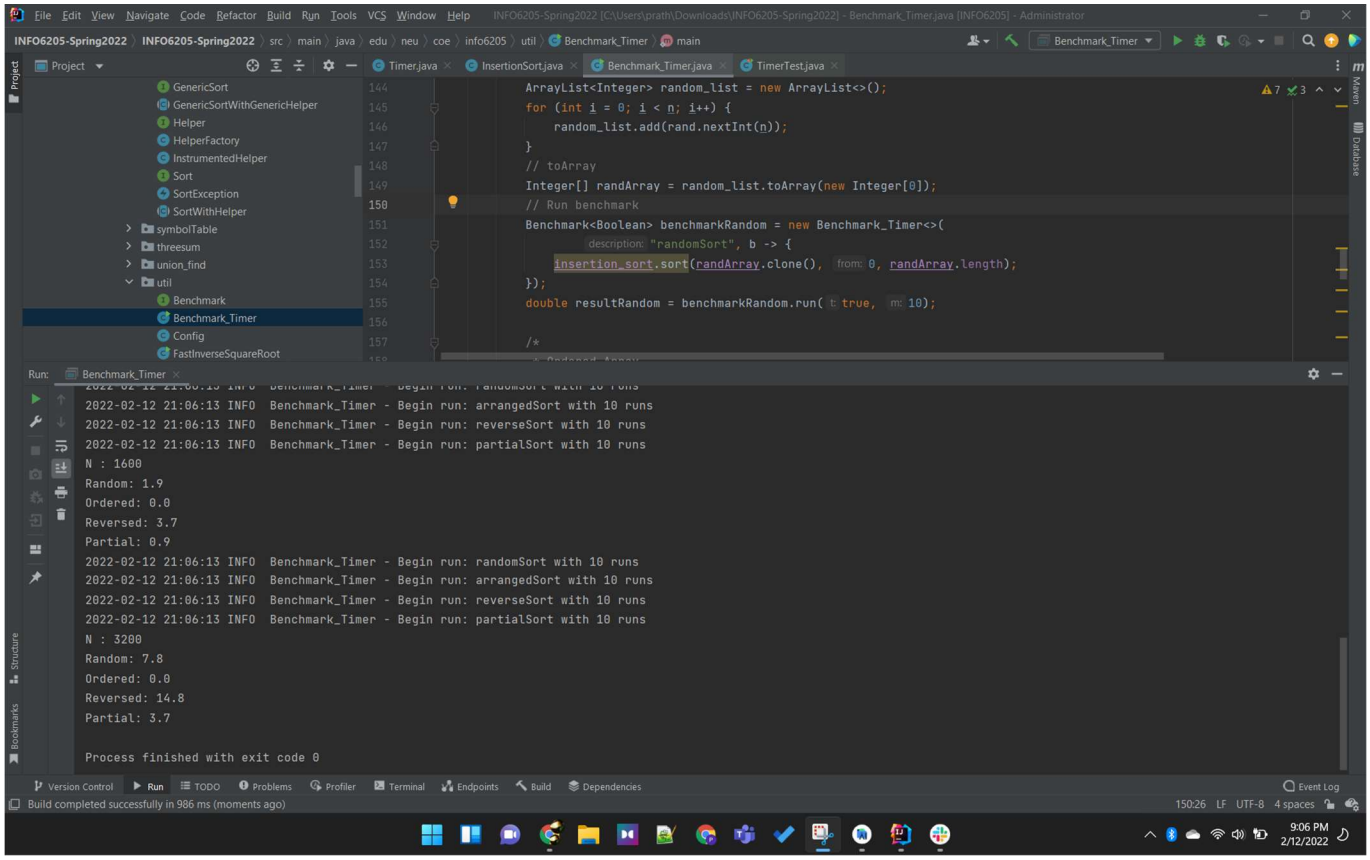
TASK:

1. Implement methods of Timer Class.
2. Implement sort method in Insertion Sort class.
3. Execute benchmark on Insertion Sort

OUTPUT:

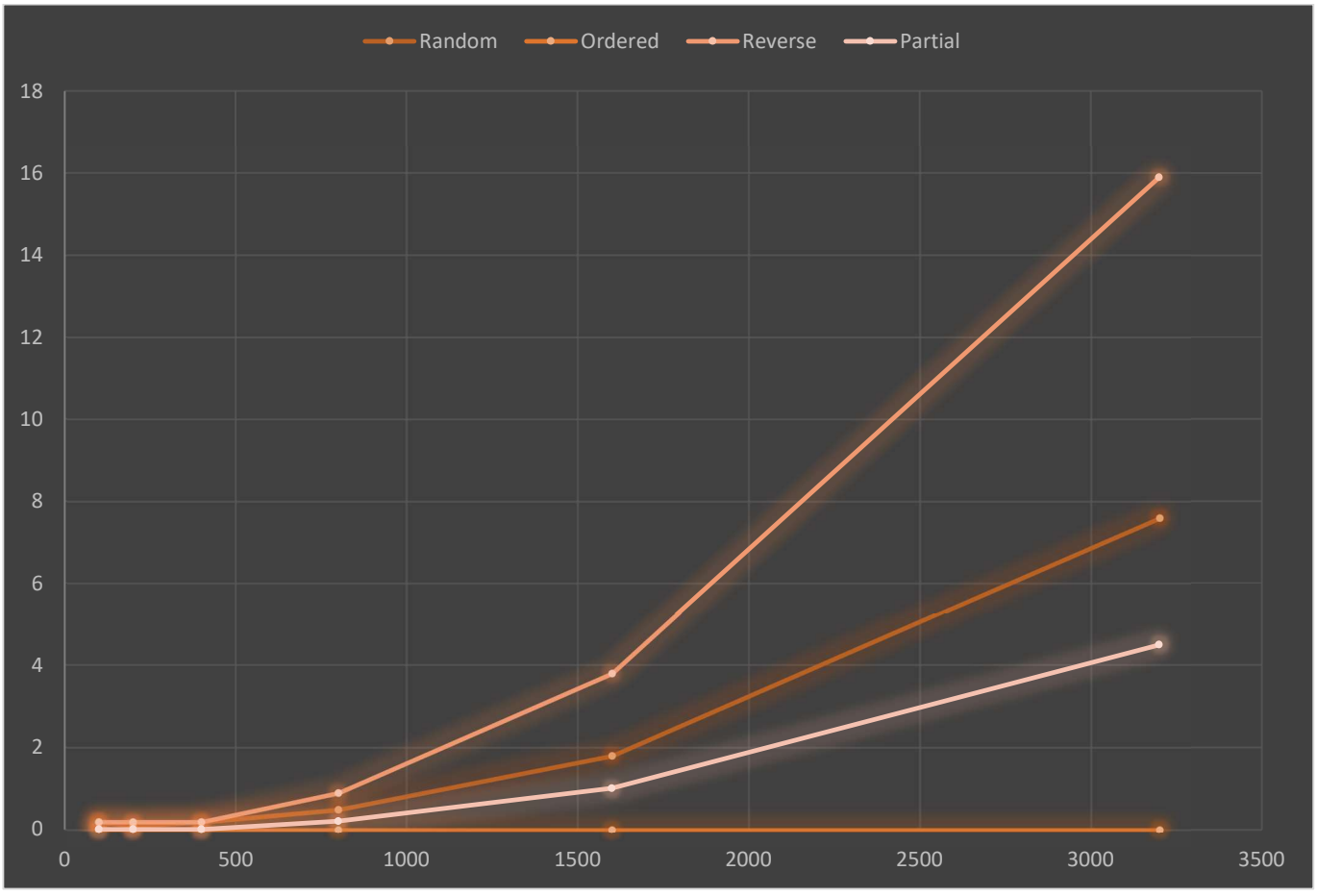


CONCLUSION:

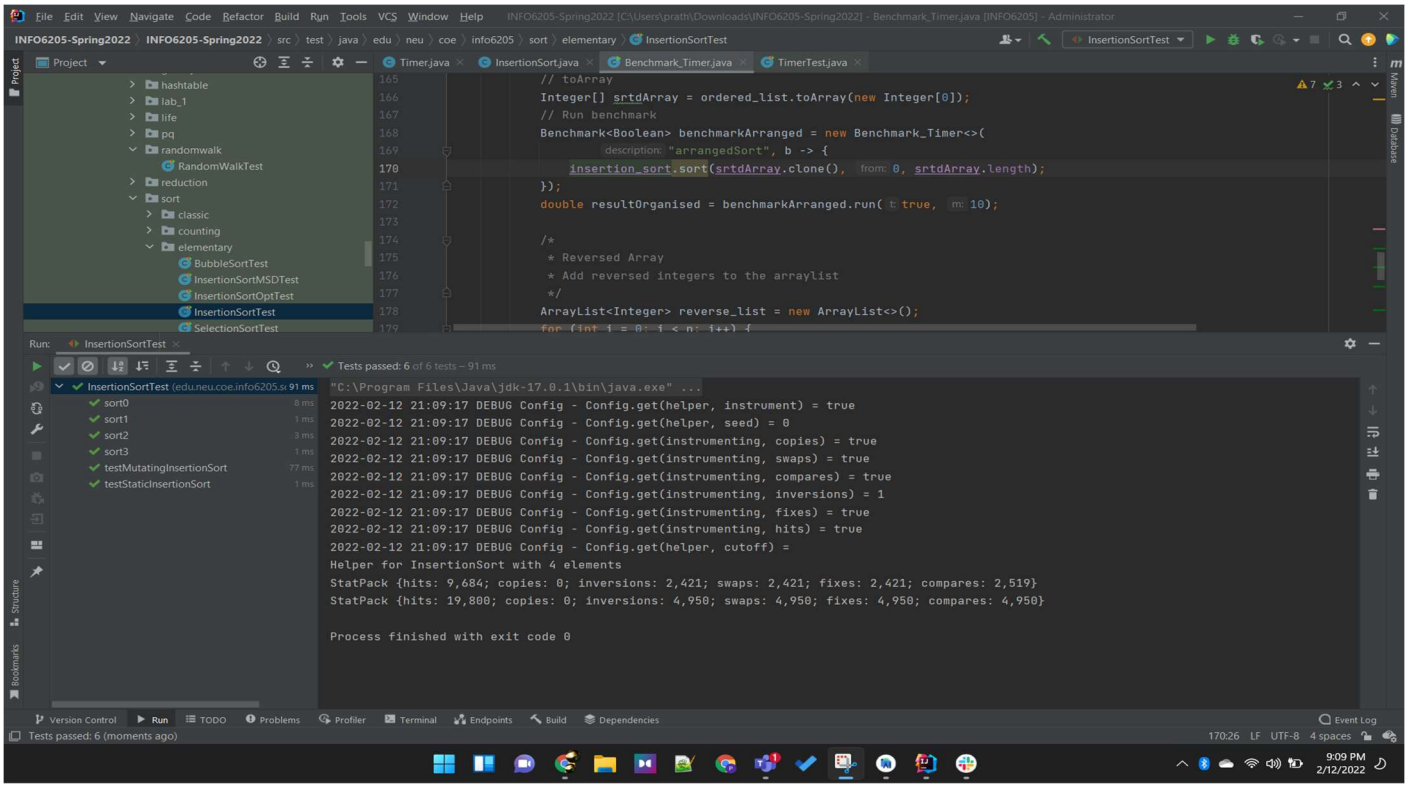
In Benchmark testing, the highest time is recorded in reverse ordered insertion sorting which has time complexity of $o(N^2)$. Random ordered insertion sorting has the second highest time followed by partial ordered insertion sorting and then at last ordered insertion sorting.

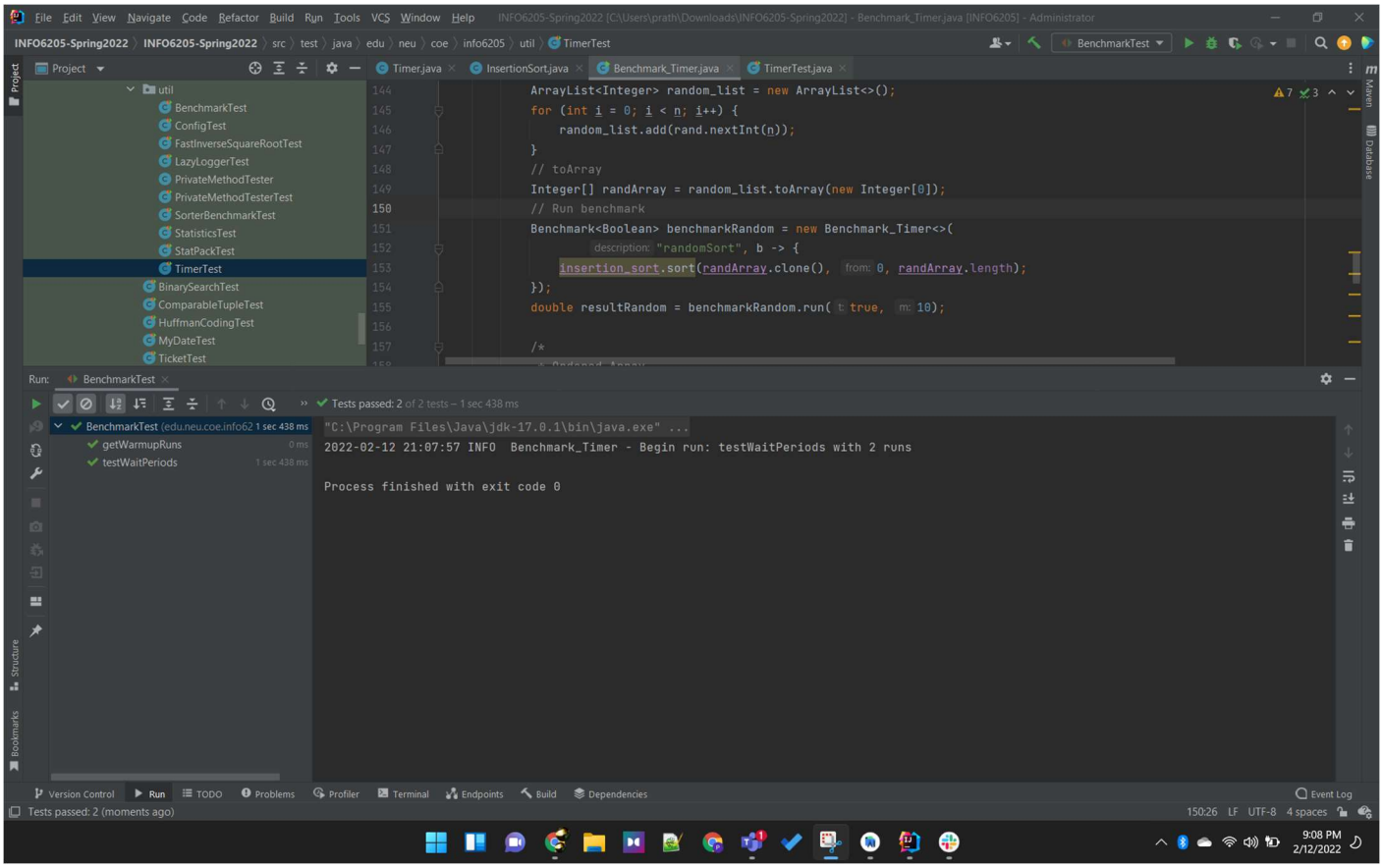
EVIDENCE:

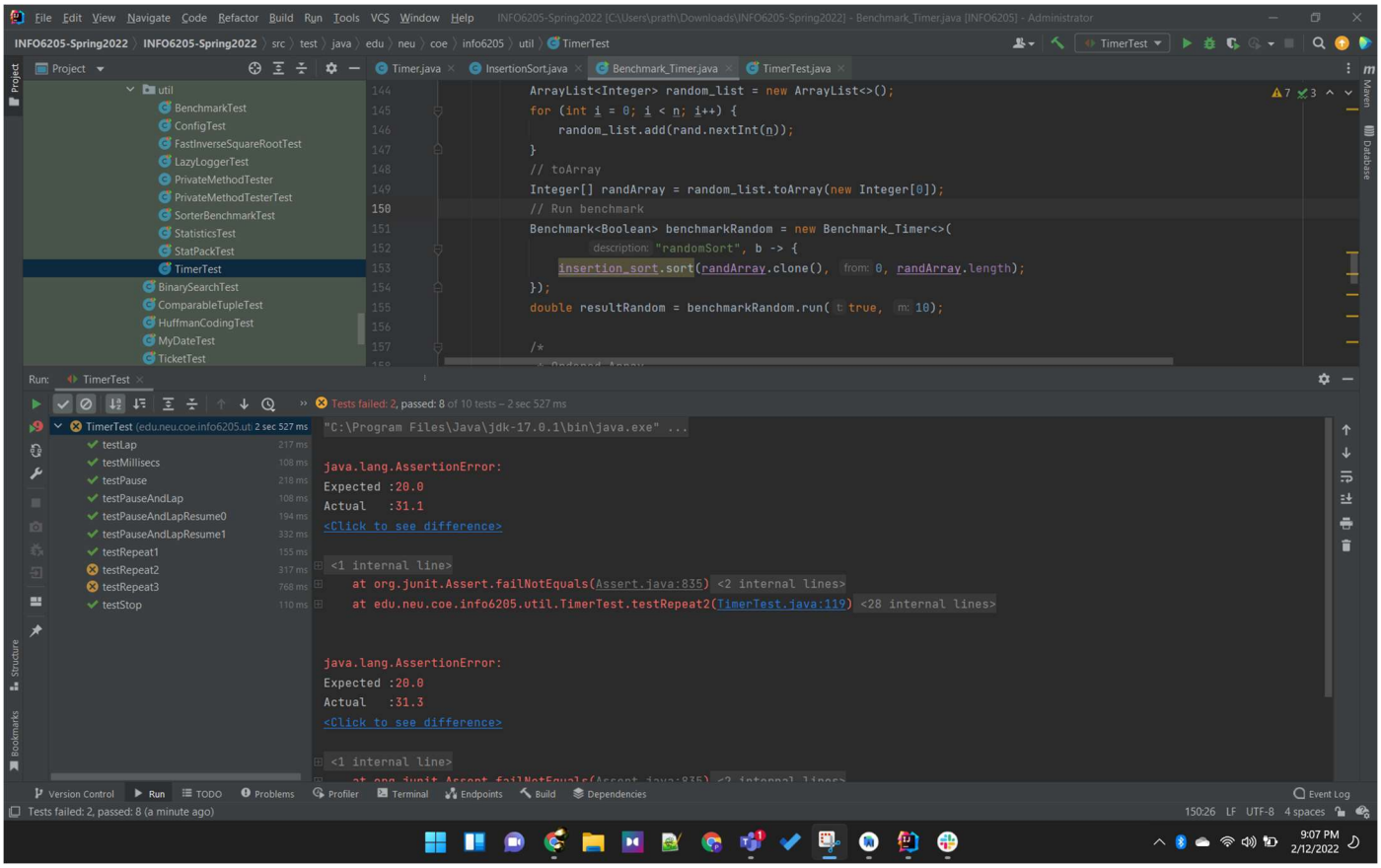
N	Random	Ordered	Reverse	Partial
100	0.2	0	0.2	0
200	0.1	0	0.2	0
400	0.2	0	0.2	0
800	0.5	0	0.9	0.2
1600	1.8	0	3.8	1
3200	7.6	0	15.9	4.5



UNIT TESTS:


Benchmark_Timer.java
InsertionSortTest
Tests passed: 6 of 6 tests – 91 ms
"C:\Program Files\Java\jdk-17.0.1\bin\java.exe" ...
2022-02-12 21:09:17 DEBUG Config - Config.get(helper, instrument) = true
2022-02-12 21:09:17 DEBUG Config - Config.get(helper, seed) = 0
2022-02-12 21:09:17 DEBUG Config - Config.get(instrumenting, copies) = true
2022-02-12 21:09:17 DEBUG Config - Config.get(instrumenting, swaps) = true
2022-02-12 21:09:17 DEBUG Config - Config.get(instrumenting, compares) = true
2022-02-12 21:09:17 DEBUG Config - Config.get(instrumenting, inversions) = 1
2022-02-12 21:09:17 DEBUG Config - Config.get(instrumenting, fixes) = true
2022-02-12 21:09:17 DEBUG Config - Config.get(instrumenting, hits) = true
2022-02-12 21:09:17 DEBUG Config - Config.get(helper, cutoff) =
Helper for InsertionSort with 4 elements
StatPack {hits: 9,684; copies: 0; inversions: 2,421; swaps: 2,421; fixes: 2,421; compares: 2,519}
StatPack {hits: 19,800; copies: 0; inversions: 4,950; swaps: 4,950; fixes: 4,950; compares: 4,950}
Process finished with exit code 0


Benchmark_Timer.java
BenchmarkTest
Tests passed: 2 of 2 tests – 1 sec 438 ms
"C:\Program Files\Java\jdk-17.0.1\bin\java.exe" ...
2022-02-12 21:07:57 INFO Benchmark_Timer - Begin run: testWaitPeriods with 2 runs
Process finished with exit code 0


File Edit View Navigate Code Refactor Build Run Tools VCS Window Help
INFO6205-Spring2022 [C:\Users\prath\Downloads\INFO6205-Spring2022] - Benchmark_Timer.java [INFO6205] - Administrator
INFO6205-Spring2022 › INFO6205-Spring2022 › src › test › java › edu › neu › coe › info6205 › util › TimerTest
Project
util
BenchmarkTest
ConfigTest
FastInverseSquareRootTest
LazyLoggerTest
PrivateMethodTester
PrivateMethodTesterTest
SorterBenchmarkTest
StatisticsTest
StatPackTest
TimerTest
BinarySearchTest
ComparableTupleTest
HuffmanCodingTest
MyDateTest
TicketTest
Timer.java
InsertionSort.java
Benchmark_Timer.java
TimerTest.java
ArrayList<Integer> random_list = new ArrayList<>();
for (int i = 0; i < n; i++) {
random_list.add(rand.nextInt(n));
}
// toArray
Integer[] randArray = random_list.toArray(new Integer[0]);
// Run benchmark
Benchmark<Boolean> benchmarkRandom = new Benchmark_Timer<>(
description: "randomSort", b -> {
insertion_sort.sort(randArray.clone(), from: 0, randArray.length);
});
double resultRandom = benchmarkRandom.run(t: true, m: 10);
/*
Run: TimerTest
Tests failed: 2, passed: 8 of 10 tests – 2 sec 527 ms
TimerTest (edu.neu.coe.info6205.uti 2 sec 527 ms
testLap 217 ms
testMillisecs 108 ms
testPause 218 ms
testPauseAndLap 108 ms
testPauseAndLapResume0 194 ms
testPauseAndLapResume1 332 ms
testRepeat1 155 ms
testRepeat2 317 ms
testRepeat3 768 ms
testStop 110 ms
"C:\Program Files\Java\jdk-17.0.1\bin\java.exe" ...
java.lang.AssertionError:
Expected :20.0
Actual :31.1
<Click to see difference>
<1 internal line>
at org.junit.Assert.failNotEquals(Assert.java:835) <2 internal lines>
at edu.neu.coe.info6205.util.TimerTest.testRepeat2(TimerTest.java:119) <28 internal lines>
java.lang.AssertionError:
Expected :20.0
Actual :31.3
<Click to see difference>
<1 internal line>
Version Control
Run
TODO
Problems
Profiler
Terminal
Endpoints
Build
Dependencies
Event Log
Tests failed: 2, passed: 8 (a minute ago)
150:26 LF UTF-8 4 spaces
9:07 PM
2/12/2022