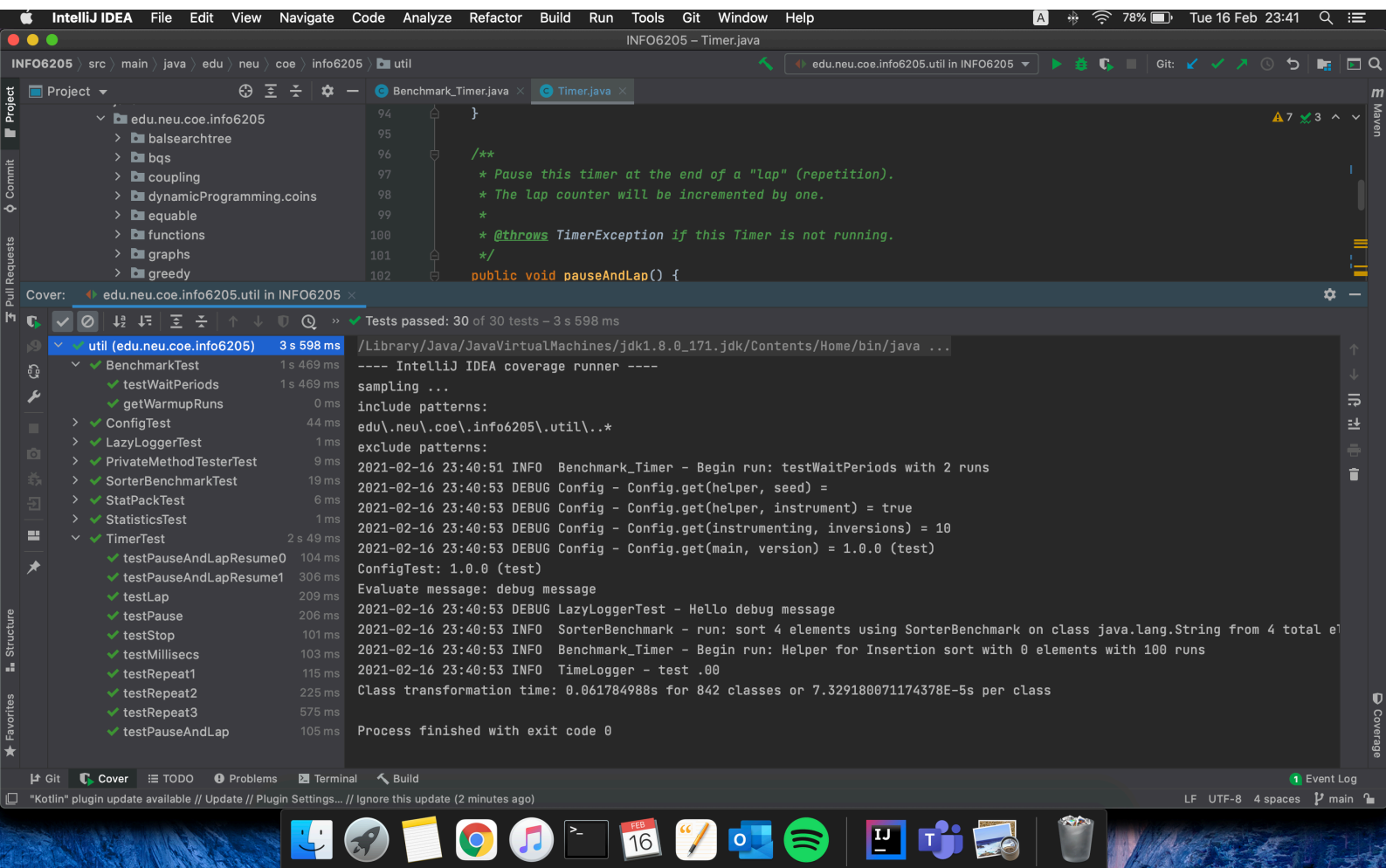


Assignment 2

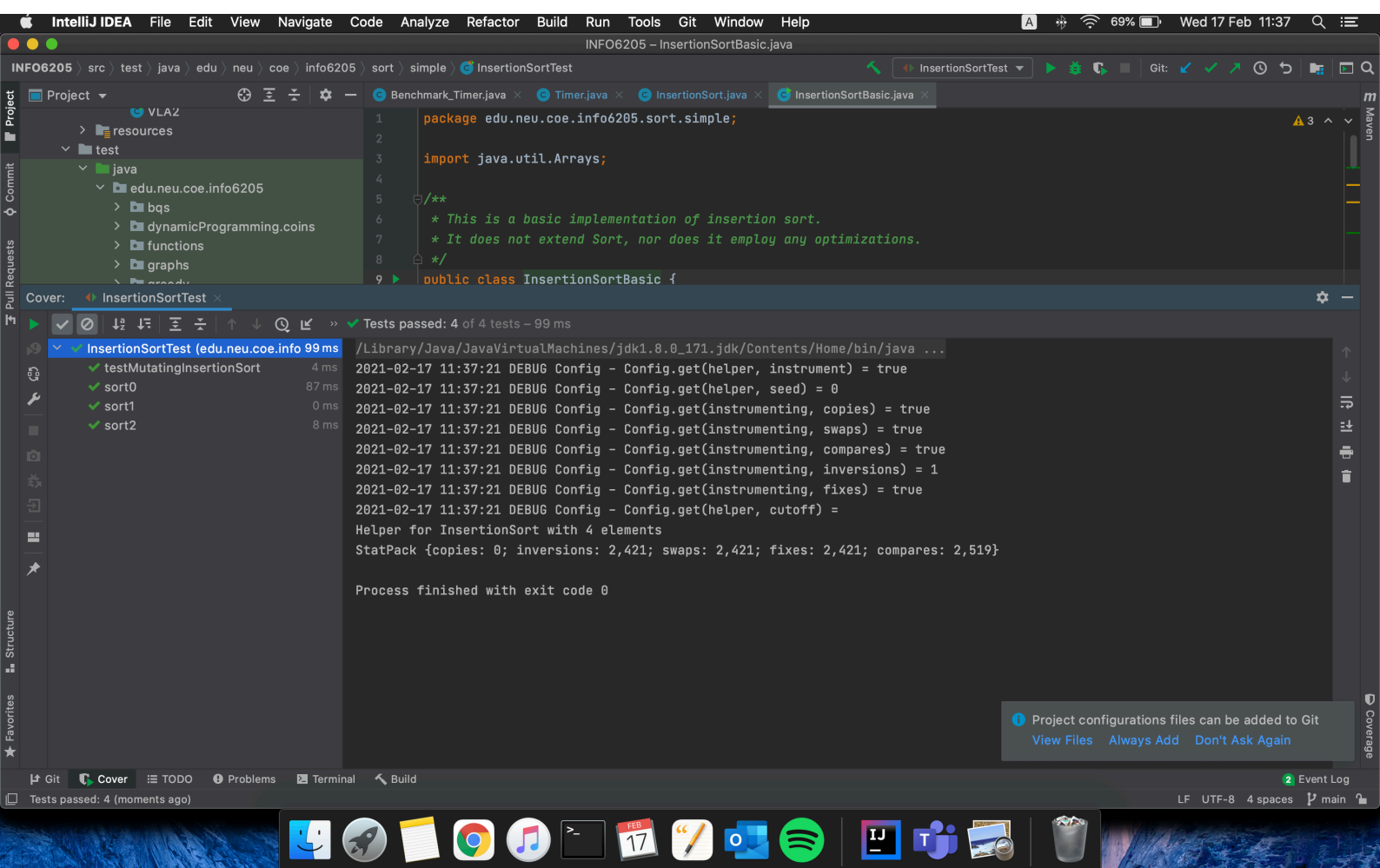
Submitted By:
Madhurima Chatterjee
001003806

PART 1:



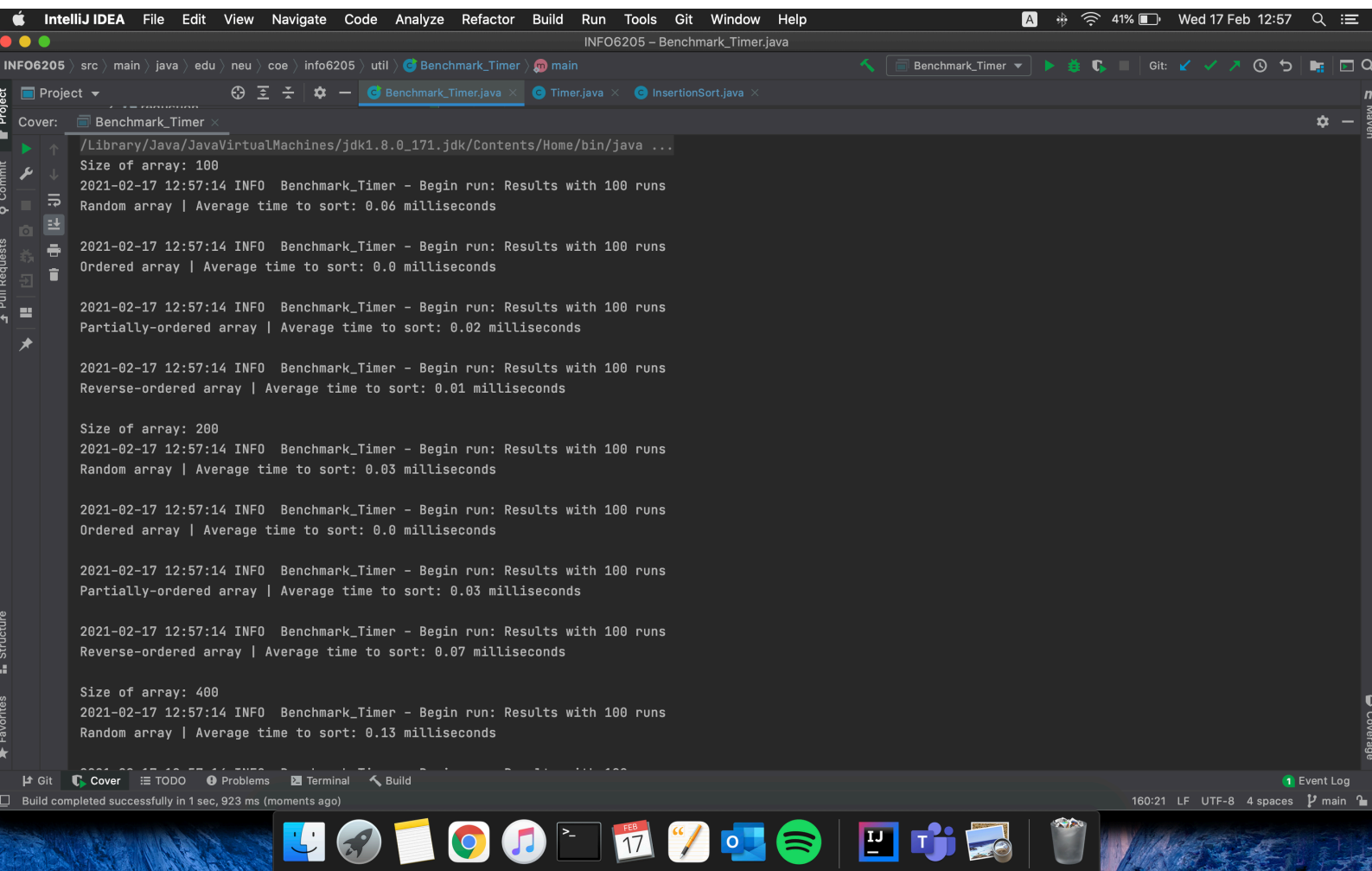
Running unit tests in BenchmarkTest and TimerTest

PART 2:



Running unit tests in InsertionSortTest

PART 3:



The screenshot shows the IntelliJ IDEA IDE with the `Benchmark_Timer.java` file open. The Run tool window displays the output of the program, which benchmarks sorting algorithms for different array sizes (100, 200, 400) and types (Random, Ordered, Partially-ordered, Reverse-ordered). The output shows that the Ordered array is sorted in 0.0 milliseconds, while the Random array takes approximately 0.06 milliseconds for size 100 and 0.13 milliseconds for size 400. The IDE interface includes the Project tool window on the left, the Run tool window at the bottom, and the macOS dock at the very bottom.

```
INFO6205 - Benchmark_Timer.java
src \ main \ java \ edu \ neu \ coe \ info6205 \ util \ Benchmark_Timer \ main
Benchmark_Timer.java x Timer.java x InsertionSort.java x
Cover: Benchmark_Timer x
/Library/Java/JavaVirtualMachines/jdk1.8.0_171.jdk/Contents/Home/bin/java ...
Size of array: 100
2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Random array | Average time to sort: 0.06 milliseconds

2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Ordered array | Average time to sort: 0.0 milliseconds

2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Partially-ordered array | Average time to sort: 0.02 milliseconds

2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Reverse-ordered array | Average time to sort: 0.01 milliseconds

Size of array: 200
2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Random array | Average time to sort: 0.03 milliseconds

2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Ordered array | Average time to sort: 0.0 milliseconds

2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Partially-ordered array | Average time to sort: 0.03 milliseconds

2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Reverse-ordered array | Average time to sort: 0.07 milliseconds

Size of array: 400
2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Random array | Average time to sort: 0.13 milliseconds

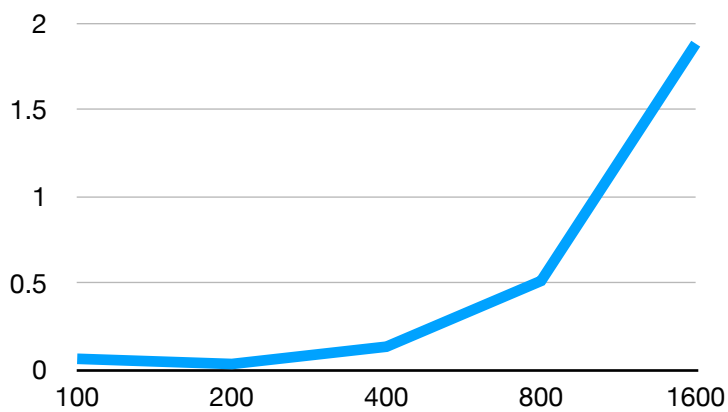
2021-02-17 12:57:14 INFO Benchmark_Timer - Begin run: Results with 100 runs
Reverse-ordered array | Average time to sort: 0.07 milliseconds

Build completed successfully in 1 sec, 923 ms (moments ago)
```

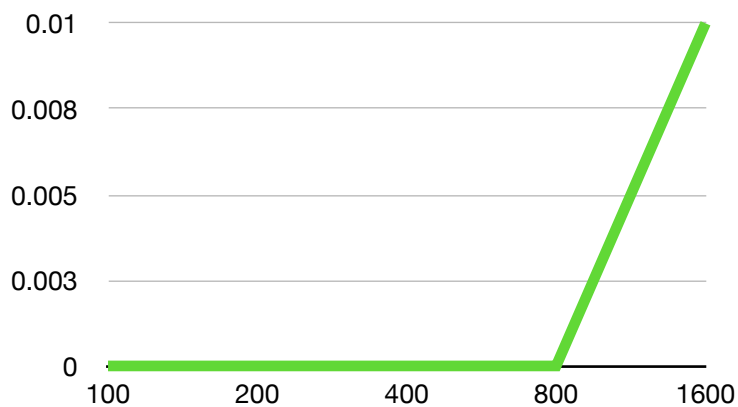
Running `Benchmark_Timer` after adding main method

CONCLUSION:

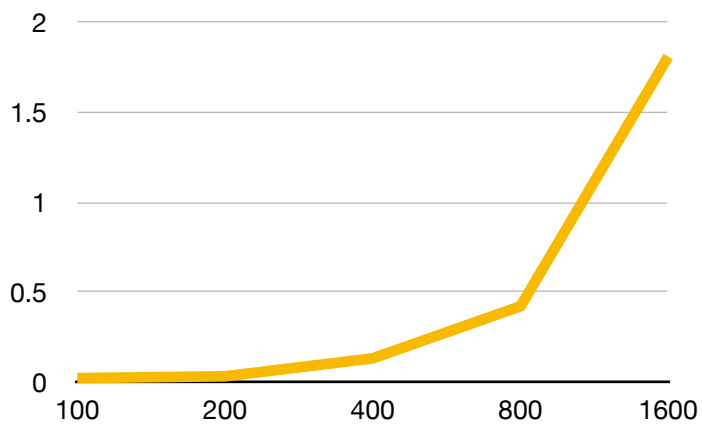
Random Array	
Size of Array	Time for execution (in milliseconds)
100	0.06
200	0.03
400	0.13
800	0.51
1600	1.88



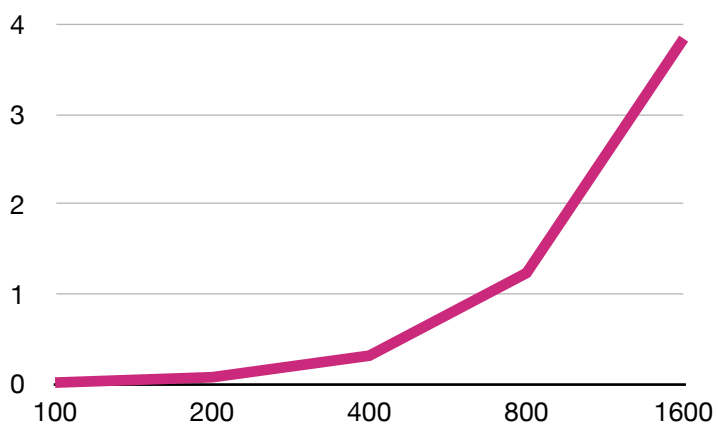
Ordered Array	
Size of Array	Time for execution (in milliseconds)
100	0
200	0
400	0
800	0
1600	0.01



Partially Ordered Array	
Size of Array	Time for execution (in milliseconds)
100	0.02
200	0.03
400	0.13
800	0.42
1600	1.81



Reverse-Ordered Array	
Size of Array	Time for execution (in milliseconds)
100	0.01
200	0.07
400	0.31
800	1.23
1600	3.84



Inference: Based on the output values, as the size of the array doubled, the time to execution had an approximately quadruple value.