Project 2

CMSC 315

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UML

A diagram of a program

Description automatically generated

Test Plan

Test Case 1:

For the first test case, I wanted to make sure that the initial points would graph and make the initial maximal lines. To test this, I added all the points manually to the Array List. The results of this first test case was a pass.

A screenshot of a computer

Description automatically generated

Test Case 2:

For the second test case I wanted to ensure the point would remove on the right click. The test results were Pass for this.

A screenshot of a computer

Description automatically generated.

Test Case 3:

For the last test case I wanted to make sure that new points were added on the left click. After left click was made, I wanted to make sure that the maximal line was drawn. The results were a Pass.

A screenshot of a computer

Description automatically generated

Big-O Analysis

A screen shot of a computer program

Description automatically generated

The method starts by sorting the points based on their x-coordinate using Collections.sort(points). Sorting n elements has a time complexity of O(nlogn). Then the program iterates through each point in the list with for (Point p: points). The loop runs n times, where n is the number of points. The total number of operations across all iterations of the for loop is O(n). Each point is added to the result list with result.add(p), which is A O (1) operation. With all these steps combined, the overall complexity is dominated by the dominated by the sorting step, which is O (n log n).

Lessons Learned

This project proved to very difficult. The first difficult problem was getting the points in the array to added with a circle. The overall difficulty was creating the logic to get for every aspect of this project. The lessons I learned was the difference between implementing and extending. With implementation you must use all methods associated with the parent method. With extending you can only use one extensions.