Project 2 – Data Structures and Algorithms

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UMGC CMSC 315

Author Note

This program reads in a file of points and adds them to a Pane and displays them in an Application GUI in JavaFX. It has an exception to catch if no file is attached or is wrong, it will not allow you to enter a new file number but will allow you to start fresh in an empty application.

UML Class Diagram

A screenshot of a computer

Description automatically generated

**Project 2 – Data Structures and Algorithms**

Assignment 2 was extremely challenging and took me awhile to grasp. It wasn’t until your announcement that I realized that the points were starting from the top left of the screen. For the Big-O notation to find the max set I believe it will be O(n^2) where n is each point in the pointslist. I came to this conclusion by seeing that the outer loop iterates through all points in the pointlist and the inner loop compares its point to the outer loop’s point. I do believe it is O(n^2) even with the nested if statement because isBelowToLeft will be O(1) for each time it is called but, it will be called (n-1) times therefore it will be O(n^2).

In this week’s assignment it has taught me the complexity of trying to break down Big-O notation for classes and furthermore a program. I do believe I am grasping many of these concepts rather well, but it requires a lot of rereading and watching of Dr. Liangs book and videos. I also learned my most challenging and frustrating lesson of JavaFX which was that the y coordinates were inverse. As I stated before, it was not until your announcement that I realized this to be true. I launched into DEBUG mode with print statements to terminal to see what my lists were at each point which taught me how to use stream to print collections. This was the most frustrating part of this project. I also learned a little more about how the scanner reads in files and will use the new line or space as a breaking point for when it is finding new doubles. At first in my read points from file method I was overcomplicating my code by adding if statements for each when in reality this is something that Scanners nextDouble has pre-built.

In conclusion this assignment was very challenging and required a lot of logical thinking to come up with the right theoretical situations before implementing them in the code. I also found that when I was thinking about this writing the ideas on paper helped drastically to visualize my ideology.

**Test Table**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Test Case** | **Input** | **What to Test** | **Actual Output** | **Pass/Fail** |
| 1 | Open Project 2  run points.txt  end | See if it will oprn application and display points in the file | File is read in and  Points are displayed | Pass |
| 2 | While It is open  Add 5 points | This will check the addPoints and addLines methods.  Also, it will update the maxList and redraw lines on new max points or not draw points if it is below and to left of max points. | Added 5 points and successfully update maxList | Pass |
| 3 | Remove 5 points from the application | This will test he remove points, drawpoints, drawlines, findMax, and compareTo method. | Removed 5 points and displayed new max list | Pass |
| 4 | Remove File name to make sure it sends error to terminal and opens blank application | Tests the File not found exception as well as the application opening even though there is an error | Successfully opens blank application and triggers file not found exception to terminal. | Pass |
| 5 | Add points to blank filenot found application | Tests that the application is working on a filenotfoundexception | Successfully allows you to add points to the Application and creates new max list. | Pass |

**Screenshots**

**Test Case 1**

**A screenshot of a computer

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**Test Case 2**

**A screenshot of a computer

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**Test Case 3**

**A screenshot of a computer

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**Test Case 4**

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**Test Case 5**

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**Rough Drafts**

**A notebook with writing on it

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**A graph paper with a square and numbers

Description automatically generatedA graph paper with writing on it

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