**CS 2302 Data Structures**

**Lab Report #2**

**Sorting**

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September 13, 2019

**Introduction**

Sometimes data we store or retrieve in an application can have little or no order. We may have to rearrange the data to correctly process it or efficiently use it. Over the years, computer scientists have created many sorting algorithms to organize data.

This lab will use bubble sort, which replaces a number if it is smaller than its predecessor; and quick sort, which utilizes a pivot to split the list into to sub lists with lower and greater value than the pivot.

**Implementation**

The following methods were implemented:

**Bubble sort:**

This sorting algorithm goes through the list and determines if the current number has a greater value than the next, if it does, it will swap the two.

**Quick sort:**

This algorithm splits the list by determining which number are greater or lower than the current number. The left list contains the lower numbers, and the right list contains the greater numbers.

**Modified quick sort:**

This modified version of quick sort had to only search the list that the k number was in. To do this, a separate partition method was implemented that determined which number would be the pivot. By using this, a new method that only used one recursive call could be implemented.

**Stack quick sort:**

This method also used the partition method to determine the pivot and implemented a stack to sort the list.

**While quick sort:**

The last method was to implement quick sort modified but with the use of a while loop, again, the partition method was used to determine the pivot.

**Experimental Results**

A screenshot of a cell phone

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**Conclusion**

After being able to successfully solve most of the problems, I feel confident that my skills at sorting have improved. The most challenging part was to acknowledge that a partition method had to be implemented to help with the other quick sorting methods. After this, drawing the process really helped into figuring out the steps to accomplish this.

**Appendix**

**A close up of text on a black background

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“I certify that this project is entirely my own work. I wrote, debugged, and tested the code being presented, performed the experiments, and wrote the report. I also certify that I did not share my code or report or provided inappropriate assistance to any student in the class.”