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Written Report

Algorithms are such an important piece to computer science. Not only are they found within computers, but everyone uses them on a day-to-day basis, including yourself. A recipe for baking or cooking something is the best example. You follow the recipe, a set of instructions, to produce an expected output. In general, an algorithm is a finite set of instructions used to solve a problem and produce an outcome. There are many different types of sorting algorithms that will sort a given dataset in a matter of microseconds. Popular examples of these algorithms are Bubble Sort, Insertion Sort, Heap Sort, Selection Sort, Merge Sort, and Quick Sort. My team and I conducted a series of steps to have these different methods sort a data set in different formats. The four types of data sets are random, almost sorted, duplicated, and reversed.

For this project, we assigned different algorithms to different people. I was in charge of the Heap Sort sorting algorithm. Heap Sort is very similar to Selection Sort, where you find the maximum element and place it at the end of the list. You then keep repeating that process for the rest. Heap Sort was one of the trickier ones from the rest mainly because of the heapify function. Instead of creating separate copies of input data, it takes the same existing array to sort. After finalizing each of our sorts, we sat down and compared the duration for how long it takes to sort the data for each individual sorting method. We concluded that for each type of data set, Bubble Sort took the longest to sort the data. Also, it was clear that Heap Sort was the quickest to sort out of all of them. The rest were fairly quick as well with only a few exceptions.

Once the data is collected and gathered, one of the biggest parts of a team project is the presentation. Presenting your work to the audience shows the task, how your team handled the task, the statistics and data from completing the task, and then any lessons learned at the end. Project management is a super important skill that needs to be present in any team project. We organized the presentation in different parts. We first talked about how we are approaching this task. Then we walked through each code for each sort and timer, along with showing the types of data sets. Finally, we showed the results in a graphical format and stated if it was an overall successful or unsuccessful approach, along with any errors or problems that we encountered.

Throughout this project, there were a few things that I found challenging. First off, Heap Sort is written much differently than the others, so it took a little longer for me to fully understand how it works. Also, since we’re all writing code on different computers, some compilation errors came up since some of us have Mac OS operating systems and some have Windows. Other than that, everything ran smoothly as a team and the expected outcome was produced.