Assignment 1 Writeup

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9/26/21

CS 315

Section 002

Problem Statement

We were given the task of sorting all Pokémon based on the Stats (Power). We are supposed to sort using Insertion Sort, Merge Sort, and Quick Sort.

Implementation

I just used the readFile.cpp that was given for my main program and template. I implemented my Insertion Sort as follows:

void insertionSort(vector<int>& data, int n, int& count)

I used the parameters as a vector since the read is in a vector. I also just used n to look at the size of the array in the main function (power.size() ). For this data I used the for loop to iterate until i is less than n. In the while loop we look at the vector of “data” and make a new variable to house the data with a temporary value. We subtract one from j every single time and up the count when this occurs.

**Merge Sort –**

For the Merge Sort we will make the parameters as given:

void MergeSortedIntervals(vector<int>& v, int s, int a, int b, int& count)

we make a temporary vector being “temp” and make separate variables to iterate. We make a while loop and push the intervals back in the temporary vector to house new values, while also upping the count. We also have a count in the else loop that will push as well when i is less than a and j is less than b. We have two separate while loops that check to see if they are less than a and b. if they are they will use the temporary vector respectively and add a count. After we have a for loop that will check if I is equal to s, after all conditions are met, the v index will become equal to the temporary value [i – s]. We then make a separate function called MergeSort to incorporate the MergeSortedIntervals.

**Quick Sort –**

For the Quick Sort we make a partition function and a Quicksort Function. We have a vector again with a start, end, and a count. We set the pivot to the end and an integer to the start. We have multiple loops to iterate through the array and then swap them at the end.

After that we go into the main to look at how everything sorted.

Results

A screenshot of a computer

Description automatically generated with medium confidence

Here is the Expected Graphs:

My results were somewhat close, with a couple anomalies and in the Merge Sorts, but most were within a certain margin of error. My results were also based on off all nine files of Pokemon. The order given by the excel spreadsheet is the order of the graphs shown above.