Project 10 - User Document

In programming, sorting algorithms provide very important functions and in many cases it is important to minimize the time that the algorithm takes to run. This program builds heavily on the concept of optimizing code and using the sorting methods that are the most efficient. In general, the quick sort algorithm and the merge sort algorithm have a time which is O(n). The other algorithm that is looked at in this program is the insertion sort which in general has a time of O(n^2). This program looks to validate these theoretical values by providing a client with the ability to test various different arrays. This program generates three arrays with the same random values and uses each of the algorithms to sort the arrays. The number of steps that the sort runs is kept track of and reported back to the user to show the difference in the efficiency of the algorithms.

The program file that needs to be compiled and run is sort.cpp. These file is located in the project10 folder underneath the programs folder.

To compile and link the files, enter:

g++ sort.cpp

To run the program, enter a.out and respond to the program’s prompts for user input. This program will terminate after the list from the file are outputted to the terminal or a file that is not available is attempted to be opened.

After compiling the program and entering a.out an example run of the program would look something like this:

Enter the number of values to generate and sort, between 1 and 5000:750

Enter an integer seed value: 42

Print the values? n

Insertion Sort count = 145364

Merge Sort count = 14452

Quick Sort count = 7785

Note that the counts will differ on each run but the general trend of the sorts should be observed.