CS 474 Capstone Proseminar - 07A

Experiment Design Exercise

Natalie Lee, Elijah Olsson

Fall 2023

Hypothesis

Quicksort performs better than Insertion sort.

Methodology

1. Correctly implement and compile Quicksort and Insertion Sort as functions in C++.
2. Randomly generate unsorted integer arrays of sizes 2, 10, 50, 100, 1000, 10000, and 100000 to use as input data.
3. Create a driver file that imports the two sorting algorithms. Initialize two separate timers, timer1 and timer2, to accurately measure the execution times of the sorting algorithms.
4. With the first array of size 2 run the following steps.
5. Start timer1
6. Run Quicksort with the input array.
7. Once the algorithm is completed, stop timer1 and record this time.
8. Start timer2
9. Run Insertion sort with the same unsorted input array.
10. Once the algorithm is completed, stop timer2 and record this time.
11. Repeat steps 5-10 with the same data set 10 times (to get an average time for the data set of size 2).
12. Repeat steps 5-11, but change the input data array to the next size up. Repeat this process until there are no remaining data sets.