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02/15/2021

CSE 13S Winter 2021
Assignment 5: Sorting
Writeup Document

Time Complexities

The time complexity of each sort is as follows:

Algorithm	Time Complexity		
	Best	Average	Worst
Bubble Sort	O(n)	O(n^2)	O(n^2)
Shell Sort	O(nlogn)	O(n(logn)^2)	O(n(logn)^2)
Quick Sort	O(nlogn)	O(nlogn)	O(n^2)
Heap Sort	O(nlogn)	O(nlogn)	O(nlogn)

Constants

These are the time complexities including the constants:

Algorithm	Time Complexity (with constants)
Bubble Sort	
Shell Sort	
Quick Sort	
Heap Sort	

What I learned

I learned about four sorts during this assignment: Bubble Sort, Shell Sort, Quick Sort, and Heap Sort. I learned about the backgrounds of each one, how to implement them, and their efficiency in different cases.

My experimentation

To learn more about each sort's efficiency, I ran a variety of tests. With my program, I ran tests with different array sizes to determine which sort is most efficient with larger amounts of data.

Different sorts' performances visualized

Graphs

Analysis