ASSIGNMENT 3 DESIGN DOCUMENT

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1 Goal

Implement several sorting algorithms in C, and write a test harness allowing the user to run, and collect statistics on each algorithm.

2 Pseudocode

TEST HARNESS

-This is a main function using GETOPT: Allows the user to run and display the various math functions from the terminal

-include all .h files (sorting algorithms, and the set header)

-Specify the command line options: "ahbsqrnp"

-using a switch statement, write cases for each option

-every sorting function will toggle a variable to 1, corresponding to each function

-r sets the seed for the random number generator, used to fill up a list with random numbers to be sorted

-n sets the size of the list to be sorted

-h displays a help message a terminates the program

-EX: if -a is input, atoggle = 1

-h instead displays a help message and returns 1 to terminate the program

-after the switch statement, check each the value of each toggle variable

-if a variable is set to 1 (meaning the option has been input into the terminal), run the corresponding sorting algorithm

SHELL

-Include the stats header

-write a gap function to be used in the shell sort algorithm:

-if the gap is = 1, then return 0, if the gap = 2 then return 1

-else return 5 times gap / 11

-SHELL ALGORITHM:

-loop from gap function, with the exit condition gap ¿ 0

-increment by setting gap to gap function(gap)

-inside the loop, nest another for loop

-loop from gap, to the number of elements in the list to be sorted

QUICK

-if there are less than 2 elements, do nothing

-move the pivot element in the array

-split array using the pivot (if the element it greater or less)

MAKEFILE

-Compiles and formats all .c files

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