ECE 368 Project 1 Milestone 1

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First, I should write a function for reading the input file that stores the size of the integers to be sorted and return the integers in an array of long.

Subsequently, a function for generating the output file should be written, which writes the sorted array of integers into a file in the same format as the input files.

Then I should write a function that generates the sequence for shell sort. The function should include a while loop that checks the numbers calculated each time and terminates once the number exceeds the count of the integers being sorted. Within the while loop, each number is calculated with 2^p3^q, then the p and q values increment consecutively. I should also create a helper function that accepts two integers and calculated the first number to the power of the second one to avoid the use of the math library. A similar function should be written to generate the sequence for the bubble sort algorithm, which divides numbers starting from the count of the integers to be sorted by 1.3 consecutively and terminates the while loop when it reaches 1. The floor function should be called to make sure each value is an integer before adding them to the array.

The shell sort function should be constructed with 3 for loops casted within each other with a while loop in the center to determine if values need to be swapped. The out most for loop goes through each element of the generated sequence, the second for loop calls insertion sort on each sub array, and the third for loop goes through each element within a sub array to check if the consecutive values need to be swapped with a while loop. Each time a comparison is made and a swap is executed the counters for either one is incremented.

The bubble sort function should be written similarly compared to the shell sort function but instead implements the bubble sort algorithm and goes through the second generated sequence for the gap values.

Two additional functions should be written to produce output files for the two gap value sequences generated by the previously mentioned functions with particular file names and the size of the arrays as input arguments.