ECE 331
Homework 5

Objective:
Compare execution times of Heap Sort and Merge Sort algorithms when sorting arrays of different sizes. The arrays to be sorted shall be the same for each algorithm, in order to make a valid comparison.

Assignment:

1. Generate c functions that implement the Heap Sort and Merge Sort algorithms using the pseudo-code given in the course textbook as the basis. Do not use library versions of these two algorithms, nor should you just copy this algorithm from an on-line source.
2. In your main program, include a provision to generate arrays of varying sizes. Populate the arrays with integers, using a random number generator function (a library function is fine). Make a copy of this input array so that the same values will be sorted using both algorithms.
3. Use a timing function to measure the execution time for each algorithm to sort the input arrays.
4. Test your sorting algorithms using arrays of size, such as 10, 100, and 1000 elements. Record the execution times and summarize the execution times in a table, ensuring that you provide time units for the execution times, ie seconds, milliseconds, clock cycles, etc.. For better insight, you should plot the results so that you can compare the two algorithm's order of growth. I recommend you include the data from homework 2 to further enhance your learning about order of growth.
5. Generate a short summary of your experimental observations and based on your results, provide a commentary on when you would use each algorithm. (You may want to conduct more experiments to refine your recommendations.)