Module 3 Problem Set

1. [10 pts] Show with a sample trace how selection sort sorts the letters
T H I S Q U E S T I O N

2. [10 pts] Show with a sample trace how insertion sort sorts the letters
T H I S Q U E S T I O N

3. [10 pts] Show with a sample trace how shell sort with the h-sequence 5,2,1 sorts the letters

M U C H L O N G E R Q U E S T I O N

4. [10 pts] If all keys are identical, does insertion sort work better than selection sort? Justify your answer.

5. [10 pts] If all keys are in reverse order, does insertion sort work better than selection sort? Justify your answer.

6. [10 pts] You are given a list of items with duplicates. Indicate how you would use sorting to produce a list of unique items.

7. [10 pts] You are given a list of words. Some of the words are jumbles of other words. For example: "caring" and "racing" are jumbles. How would you use sorting to identify the jumbles in the list?
Give pseudocode (or real code if you want) that reads in a list of words, and prints each set jumbles on 1 line. For example, if the input file is:
    racing
   secura
   saucer
   caring
   random

Your output would be:

    racing caring
     secura saucer
     random

The order does not matter.

8. [20 pts] Explain why the h-sequence 1, 2, 4, 8, 16, ..., 2^k is bad for shell sort. Find an example where the worst case happens.

9. [10 pts] Why not use selection sort for h-sorting in shell sort?