Homework Assignment #7
Course: COP 3223C – Intro to Programming with C
Semester: Fall 2016
Credit Value: 6% of Final Grade
Due Date: December 5, 2016; 3:00 PM

Searching and Sorting

This assignment involves searching and sorting. We will search a linked list and sort a contiguous list (it is easier).

1) (3 pts.) We want to build a <u>linked list</u> of 100 nodes, each containing a positive integer between 0 and 99 in reverse order (i.e., the first node will contain the number 99; the second 98; the third 97 and so on).   Write a program in C that a) builds the list; b) Ask the user what number she wishes to find in that list; c) search for that integer in the linked list you built under part a above; d) Return the position of the node in which you found the number requested. Assume the list is unordered (which of course, is not the case here), and search the entire linked list sequentially until the node containing the desired number is found. If the number is not found (say the user enters 202), it should say that the search failed.

   Set up the user entry capability in a loop so that the user can enter numbers repeatedly if she wants. That is, when a number entered is found (or not found), it will give her an opportunity to enter a new number. If the user no longer wants to use the program, she should enter -1.

   For output, print out a line stating that the value sought was found in the nth node. For example:

   ```
   Please enter the number to be sought in the list:
   >> 15

   The number 15 was found in node #85
   ```

2) (3 pts.) Write a program in C that:
   a. Builds a contiguous list of 100 cells.
   b. Populates the cells with random integers between 0 and 10,000.
   c. Prints out the list.
   d. Sorts the list in increasing order using the `InsertSort` algorithm.
   e. Prints out the list <u>after</u> sorting.

Note 1: This assignment cannot be turned in late! The deadline for all late assignments is exactly the same as the due date for this assignment.

Note 2: No constraints on how the program is written other than it must be written by the student, in C and work correctly in Code::Blocks.