**APS 105 — Computer Fundamentals**
Lab #8: Sorting a Linked List using Bubble Sort
Fall 2013

**Important note:** The course material necessary for completing this lab will be found in your lecture notes and in the Carter text up to the end of Section 10.4.

You must use the `submitaps105f` command to electronically submit your solution by 11:59 p.m. on **Saturday, November 30, 2013**.

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## Objective

In this lab you will combine two parts of the course - Linked Lists and Sorting. The task is to input a list of integers, store it in a linked list, and to sort the the linked list using the bubble sort algorithm. You *must* use a linked list, or else you will be assigned a grade of 0.

## Details

Your program should have the following phases:

1. You should prompt the user to input a series of integers, with the final one being -1. For each integer (not including the -1) you should create a struct data structure to store just that number and a single link to the next item in the list (i.e. make the numbers into a Linked List, as described in Section 10.3 of the text).
2. Once the list is input you should print out "Original List:", and then print out the list, one number per line.
3. Next, you should re-arrange the list so that it is in descending order, using the bubble sort algorithm.
4. Next, you should print out "Sorted List:" and then print the sorted list, one number per line, showing that it is indeed in descending order.

The source code of your program should be put in a file called `Lab8.c`.

An example run of the program is shown below. The values `5`, `8`, `3`, `33` and `-1` are entered by the user in the example run. Given the same user input, your output should match the following output *exactly*, including all punctuation, and all wording (including the singular or plural form as needed). Any variation from this will result in a loss of marks.

```
Enter Number (-1 to finish): 5
Enter Number (-1 to finish): 8
Enter Number (-1 to finish): 3
Enter Number (-1 to finish): 33
Enter Number (-1 to finish): -1
Original List:
5
8
3
```

```
33
Sorted List:
33
8
5
3
```

## Marking

This lab will be marked out of 10. Full marks are given if your program works correctly, fewer if not, and zero if it cannot be compiled. Late submissions or submissions with an incorrect filename will result in a mark of 0 for the entire lab. The deadline is strictly enforced, so avoid last minute submissions.

You can run a testing program, called `tester`, yourself to test the correctness of your solution. At the command line in your ECF account, run:

```
/share/copy/aps105f/lab8/tester
```

in the same directory as your solution file. The testing program will use a number of test cases to test your solution, and reports `success` if your solution produces output that is **identical** to the expected output.

A marking program, called `marker`, will be used to automatically mark your lab. The marking program will use **the last version** of the lab files you submitted. Some of the test cases will be used by the marking program as well, but the marking program will also be using other test cases that are not included in the testing program to test the correctness of your program. This implies that even though you do not have access to the marking program before the submission deadline, you will obtain at least partial marks if all of the test cases in the testing program report `success` with your solution. After the submission deadline, you can access the marking program by running the following command at the command line in your ECF account:

```
/share/copy/aps105f/lab8/marker
```

The mark you receive for each part will be the same as reported by the marking program for the file you submit. Your mark for this lab will contribute 3% to your mark in the course.

## What To Submit

When you have completed the lab, use the command

```
% submitaps105f 8 Lab8.c
```

within the directory that contains your solutions to submit your files. Make sure you name your files exactly as stated (including lower/upper case letters). Failure to do so will result in a mark of 0 being assigned. You may check the status of your submission using the command

```
% submitaps105f -l 8
```

where `-l` is a hyphen followed by the letter '*ell*'.
You can also download a copy of your submission by running the command:
`/share/copy/aps105f/lab8/viewsubmitted`