

Lab 7

© INSTRUCTOR: DR. MD. MAHFUZUR RAHMAN

100 Points

Objectives:

Today we will be covering the following topics:

1. Practice function calls in a C program.
2. Practice recursion in a C program.

Instructions:

- Attendance is mandatory.
 - Labs must be completed individually.
 - If you have any questions, please do not hesitate to ask TA.
 - Follow submission instructions in the deliverable section.
 - **Lab assignments are due at midnight on the day of your lab (i.e., by 11:59 PM)**
1. Write a program that asks the user to enter a series of integers (which it stores in an array), then sorts the integers by calling the function `selection_sort`. When given an array with `n` elements, `selection_sort` must do the following:
 - (i) Search the array to find the largest element, then move it to the last position in the array.
 - (ii) Call itself recursively to sort the first `n - 1` elements of the array.

Use the `vi` editor to create your program and save it as `lab7.c`. For example, when you run your program, it may look like the following on the terminal:

```
How many integers: 12           (e.g., 12 integers to input)

Enter 12 integers: 10 3 34 21 13 10 13 9 20 39 45 68           (user input)
After the next call:  10  3 34 21 13 10 13  9 20 39 45 68
After the next call:  10  3 34 21 13 10 13  9 20 39 45
After the next call:  10  3 34 21 13 10 13  9 20 39
:
After the next call:   9  3 10
After the next call:   3  9
Sorted Array:   3  9 10 10 13 13 20 21 34 39 45 68
```

Now, do the following tasks:

- (a) (20 points) Make sure you are using the same input prompt as suggested.
- (b) (20 points) Make sure you are using recursion to solve the problem.
- (c) (20 points) Make sure you are able to locate the largest element and its index within the array.
- (d) (15 points) Make sure you swap the largest element with the last position and were able to display.
- (e) (05 points) Start recording your session using the `script` utility.
- (f) (05 points) Show the contents of `lab7.c` using the `cat` command.
- (g) (05 points) Compile `lab7.c` with required flags for the object file name [`use -o`] and C version [`-std=c99`].

- (h) (05 points) Run your program using appropriate command.
- (i) (05 points) Finish your recording (use the `exit` command).

Deliverables

For today's lab, clean the text file (.txt) you recorded during your terminal session, if there are unwanted control characters. In other words, make it as you observed during your terminal session. Please name your text file as **last-name_firstname_lab07.txt**. You will need to submit the text file (terminal session record) and your C file (lab7.c) to the **Lab 07** dropbox in iCollege.