Lab Assignment Week 09

CSC 3320 – System-level Programming

Week of March 4th, 2024

Introduction

Welcome to the eighth programming lab of CSC 3320! Today, we will be covering the following topics:

1. Functions
2. Arrays
3. Pointers

Lab Policies

- Attendance is mandatory.
- Labs must be completed **individually.**
- TAs are here to help you. Ask them for help!
- Lab assignments are due at midnight on the day of your lab.

Deliverables:

1. The C Code for your program. (.c file).
2. A screenshot of the output in the Terminal.

If you have any questions, please do not hesitate to ask your TA.

Program: Bubble Sort

Write a C program that reads a series of integers from the terminal and implements the bubble sort algorithm as a function. Your program should prompt the user to enter 10 integers. Bubble sort is a simple sorting algorithm that works by comparing the adjacent elements in the list and swapping them if the elements are not in the specified order. It is an in-place and stable sorting algorithm that can sort items in data structures such as arrays and linked lists.

You will need to implement this familiar algorithm as a function in your program. The function prototype in your solution should be as follows:

```
void bubble_sort(int array[], int n, int *min, int *max)
```

Your bubble sort should not only sort the array of 10 integers, but also provide the smallest and largest values in the array. The bubble_sort() function must not return any values, but instead sorts the array in place and assigns the min and max values to their respective pointer arguments. Hint: The first element in your sorted array will be the min and the last element in your sorted array will be the max.

Finally, your program should output the sorted list, and the min and max variables to the terminal. See example output below.

Example Output

```
Please Enter Number 1: 22
Please Enter Number 2: 77
Please Enter Number 3: 4
Please Enter Number 4: 28
Please Enter Number 5: 3
Please Enter Number 6: 44
Please Enter Number 7: 93
Please Enter Number 8: -2
Please Enter Number 9: 14
Please Enter Number 10: 15

[-2, 3, 4, 14, 15, 22, 28, 44, 77, 93]
Largest: 93
Smallest: -2
```

Deliverables

For today's lab, you will need to upload the C program code for your bubble sort program and its output in the terminal on iCollege. Please name your C code and screenshot as follows:

- C Files
  - lastname_firstname_filename.c
  - For example: **hawamdeh_faris_bubble_sort.c**
- Screenshots
  - lastname_firstname_filename.png
  - For example: **hawamdeh_faris_ bubble_sort.png**