CSC 3320: System-Level Programming

Week of 02/17/2024

Lab 6

© Instructor: Dr. Md. Mahfuzur Rahman

100 Points

Objectives:

Today we will be covering the following topics:

1. Practice array with loops in a C program.
2. Usage of random number generator.

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 by 5:00 PM the next day after your lab session.

1. Write a program that creates an array with 10 integers. The user must provide the 10 integers and your program should accept those integers using a `scanf()` function. Use `rand()` function to generate 100 random numbers in the range 0-9 (of course same random numbers will repeat multiple times). Use the generated random numbers as indices to update the value of the array at that particular index. For example, if the generated random number is 7, 8^{th} element of the array will increase by 1. Use the `vi` editor to create your program and save it as `lab6.c`. For example, when you run your program, it may look like the following on the terminal:

   ```
   Enter ten integers: 0 10 20 30 40 50 60 70 80 90       (e.g., these ten integers are user input)

   Updated Array:   10   18   35   39   48   57   71   81   86  105
   ```

   The above input and output are just an example. The updated array will also vary if you use different seed value for your random number generator. You may use `srand(time(0))` as your seed value to ensure reproducibility.

   Now, do the following tasks:

   (a) (20 points) Make sure you are using the same input prompt as suggested. `[Recall how to take array input]`
   (b) (20 points) Make sure you are generating random numbers correctly `[Recall rand()function]`.
   (c) (20 points) Make sure you were able to update your array and were able to display.
   (d) (05 points) Start recording your session using the `script` utility.
   (e) (10 points) Show the contents of lab6.c using the `cat` command.
   (f) (10 points) Compile lab6.c with required flags for the output file name `[use -o]` and C version `[-std=c99]`.
   (g) (10 points) Run your program using appropriate command.
   (h) (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 **lastname_firstname_lab06.txt**. You will need to submit the text file (terminal session record) and your C file (lab6.c) to the **Lab 06** dropbox in iCollege.

Broader Grading Criteria

- If no C (`.c`) file is submitted (regardless if `.txt` file submitted or not), a student will receive only 40% for attendance. Submission will not be graded.
- If a C file is given but no `.txt` file (terminal session) is given, a submission will receive a maximum 70% (will vary between 40% and 70% based on the correctness of the C program).
- If a `.txt` file is given along with the `.c` file, but the `.txt` file is not clean and not comprehensible to the TA, a submission will receive a maximum 80% (which will vary from 40% to 80% depending on the accuracy of the C program).
- If both a clean `.txt` file and the `.c` file are given, your submission will normally be evaluated based on the tasks and the corresponding point distributions.
- Screenshots are not substitutes for code and/or the .txt files submission.