CSC 3320: System-Level Programming

Week of 10/28/2024

Lab 9

© Instructor: Dr. Md. Mahfuzur Rahman

Lab Quiz: 30 Points, Problem Solving: 70 Points

Objectives:

Today we will be covering the following topics:

1. Practice problems involving strings using 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.
- There will be a lab quiz of 30 points arranged by Lab TA.
- Visit the broader grading criteria after the deliverable section. (last page)
- Lab assignments are due at midnight on the day of your lab (i.e., by 11:59 PM)

1. Write a program that finds the "smallest" and "largest" words in a series of words. After the user enters the words, the program will determine which words would come first and last if the words were listed in dictionary order. The program must stop accepting input when the user enters a four-letter word. Assume that no word is more than 20 letters long.

   Use the `vi` editor to create your program and save it as `lab9.c`. An interactive session with the program might look like this on the terminal:

   ```
   Enter word: dog
   Enter word: zebra
   Enter word: rabbit
   Enter word: catfish
   Enter word: walrus
   Enter word: cat
   Enter word: fish

   Smallest word: cat
   Largest word: zebra
   ```

   Hint: Use two strings (character arrays) named `smallest_word` and `largest_word` to keep track of the "smallest" and "largest" words entered so far. Each time the user enters a new word, use `strcmp` to compare it with `smallest_word`; if the new word is "smaller," use `strcpy` to save it in `smallest_word`. Do a similar comparison with `largest_word`. Use `strlen` to determine when the user has entered a four-letter word.

   Now, do the following tasks:

   (a) (10 points) Make sure you are using the same input prompt as shown above.

   (b) (10 points) Make sure you correctly intialized your two variables: `smallest_word` and `largest_word`.

   (c) (15 points) Make sure you correctly used `strcmp`, `strcpy`, and `strlen` functions.

(d) (15 points) Make sure your code produces the correct output. Your program must stop at 4-letter words, and should be able to output the "smallest" and "largest" words.

(e) (05 points) Make sure you explained your code to the TA or give enough documentation in your submission.

(f) (03 points) Start recording your session using the `script` utility.

(g) (03 points) Show the contents of lab9.c using the `cat` command.

(h) (03 points) Compile la9.c with required flags for the object file name `[use -o]` and C version `[-std=c99]`.

(i) (03 points) Run your program using appropriate command.

(j) (03 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_lab09.txt**. You will need to submit the text file (terminal session record) and your C file (lab9.c) to the **Lab 09** 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 C file is given but no `.txt` file (terminal session) is given, a submission will receive maximum 70% (will vary between 40% to 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 maximum 80% (will vary between 40% to 80% based on the correctness of the C program).
- If both clean `.txt` file and the `.c` file are given, your submission will be normally evaluated based on the tasks and the corresponding point distributions.
- Screenshots will not satisfy the requirements for code and/or the .txt files submission.
- There should be compatibility between lab quiz performance and problem-solving (programming) performance. Otherwise, you may be called for an interview with Lab TA.