
CSC172 LAB

C PROGRAMS

1 Introduction

The labs in CSC172 will follow a pair programming paradigm. Every student is encouraged (but not strictly required) to have a lab partner. Labs will typically have an even number of components. The two partners in a pair programming environment take turns at the keyboard. This paradigm facilitates code improvement through collaborative efforts, and exercises the programmers cognitive ability to understand and discuss concepts fundamental to computer programming. The use of pair programming is optional in CSC172. It is not a requirement. You can learn more about the pair programming paradigm, its history, methods, practical benefits, philosophical underpinnings, and scientific validation at http://en.wikipedia.org/wiki/Pair_programming .

Every student must hand in his own work, but every student must list the name of his lab partner (if any) on all lab reports..

This lab has six parts. You and your partner(s) should switch off typing each part, as explained by your lab TA. As one person types the lab, the other should be watching over the code and offering suggestions. Each part should be in addition to the previous parts, so do not erase any previous work when you switch.

The textbook should present examples of the code necessary to complete this lab. However, collaboration is allowed. You and your lab partner may discuss the lab with other pairs in the lab. It is acceptable to write code on the white board for the benefit of other lab pairs, but you are not allowed to electronically copy and/or transfer files between groups.

2 Some Small C Programs

The goal of this lab is to gain familiarity with C syntax and program organization. Read chapter one of the Kernighan and Ritchie text. You can copy the code directly out of the book, but it will be considered cheating to give or receive an electronic copy of any source code files.

1. Using a text editor and the C language compiler on your system implement a simple “Hello World” program in C. Your program should print three lines. The first line should say “Hello” to you lab TAs (yes, you have to know the name of your lab TAs). The second line should contain your own name and the third line should express your personal emotional attitude toward Data Structures. Example:

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Hello Edie and Zach!
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This is a note from Ted and Ripley!

Data Structures is, like, the coolest subject ever!

2. Write a small program in the C language that prints a table of temperatures in Celsius Fahrenheit and Kelvin from -50C to 100C.
3. Write a small program in the C language that reads an ASCII text file and counts the number of vowels in the text. Test this program using the output from your program of section #1 (of this lab)..
4. Write a program C program that reads and ASCII text file and counts the number of occurrences of each letter and then prints a table of 26 lines (one for each letter) with the count for that letter. Hint : use an array.
5. Write a program that contains a C function that calculates the factorial function. You may use an iterative approach.
6. Add a function to the program from section 5 that recursively calculates the power function (n to the k-th power).

3 Hand In

Hand in the source code from this lab at the appropriate location on the blackboard system at my.rochester.edu. You should hand in a single compressed/archived (i.e. “zipped”)file that contains the following.

1. A README file (see 172/grading.html) that includes your contact information, your partner's name, a brief explanation of the lab (a one paragraph synopsis including information identifying what class and lab number your files represent.).
2. C source code files (you may decide how many you need) representing the work accomplished in section 1-6 of this lab. All source code files should contain author and partner identification in the comments at the top of the file.
3. A plain text file named OUTPUT that includes author information at the beginning and shows the compile and run steps of your code. The best way to generate this file is to cut and paste from the command line.

4 Grading

172/grading.html

Each section (1-6) accounts for 15% of the lab grade (total 90%)

(README file counts for 10%)