

ECGR 3183 - Fall 2004: Lab 2

Subroutines – Due 10/4/2004

Learning Objectives

This lab will require you to use subroutines to print a menu, accept input from the keyboard, and process the input.

Prerequisites

You should be familiar with the following concepts:

- With basic programming skills and also be familiar with assembly language.
- Performing basic logical operations on numbers (x AND y, x OR y, NOT z, etc.)
- Completed Lab 1 successfully.

Prelab Assignment

There is no prelab assignment for this lab.

Laboratory Assignment

You are required to write three subroutines:

- a. One will print a menu of the screen, and will wait for valid input:
 1. Print a welcoming message
 2. Enter a two digit number to swap
 3. Exit <cr><cr>
- b. The next will print the welcome message.
- c. The next will ask for two numeral characters to be input, and print the two digits swapped.

Steps

1. Build your program slowly, testing along the way. Solve each requirement one at a time. Make sure comments are written as you progress.
2. Continue to build and test the program until all of the requirements have been met. Did we mention you should write your comments as you progress, not at the end?
3. If you run into problems, use the break point functionality of LC-3 to step through the code until you find the problem. Once all the requirements have been met ensure that everything works.
4. Demonstrate the working program to your TA or professor.
5. Finish lab write-up and turn in your report as a print out.

Requirements

Req. 1 – The code generated is to be written LC-3 assembly language

Req. 2 – The code is well commented and easy to follow

Req. 3 – Your lab report should include the final code listing

Req. 4 – The program should display the “menu” message on the screen when the program is run for the first time.

Req. 5 – When the menu is displayed, the menu subroutine should accept only inputs of 1, 2, 3 to be typed from the keyboard. All other input characters should be ignored. Pass the 1, 2, or 3 to the main program via R0.

Req. 6 – If “1” is pressed, call a subroutine to display the welcome message

“Welcome to ECGR 3183! <cr><cr>”, and return from the subroutine, **then print the menu again.**

Req 7. – If “2” is pressed, call a subroutine which will accept two input characters which are numerals – ignore all others. Once two correct numerals are entered, display them on the screen as swapped numerals with the message,

“Your input was xy, and when swapped these are yx.<cr><cr>”

Then print the menu again.

Req. 8 – If “3” is pressed, exit the program.

Req. 9 – You must have one main program, loaded at x3000, and three subroutines as described above.