ECGR4101/5101, Fall 2008: Lab 3

Building a Simple M30626 Program and using Ports

Learning Objectives

You are to write a program that runs on your QSK62P board that moves a "+" character around the LCD display. It must use polling of the switches and update the display every time a button is pressed.

Laboratory Assignments

1. The QSK62P board has four push-button switches. Use S101 through S103. (S104 is the reset switch.)
2. Find the switches on the board and on the block diagram in the board. Document in your lab report the ports each switch is connected.
3. Write and develop your program to meet the requirements, below.
4. Complete your lab report.
5. Bring the new board to the lab TA and demonstrate the code (without the HEW application running). When the TA checks your board, she will also take your lab report. You **will** need to include a printout or soft copy all of the code – there should not be much.
6. Include the printout of the .map file.

Requirements

Req. 1. You are to write a program that consists of at least two subroutines. In addition to *main* you need to one *display* function.

Req. 2. Create a *struct* that has two unsigned integer variables --- *x* and *y*. Exactly one global instance of this *struct* is to be declared. Main will set the initial *x* to 4, *y* to 0. (These represent the position of the + on the LCD display.)

Req. 3. Set up the three ports; configuring them to be inputs and not outputs.

Req. 4. The *display* subroutine will blank the LCD display, then according to the position of the plus, display the plus at the appropriate place on the LCD screen.

Req. 5. In the header comments (bottom of the comment block), add a few lines stating your name, the date, and the purpose of each subroutine.

Req. 6. Add the appropriate comments to the procedure(s) you changed that describes your intent. (What are the changes supposed to do?)

Req. 7. The behavior of the switch presses are as follows. If S101 is pressed, then the + moves one position to the left. If the + is already at the leftmost side of the screen (x=0), then it should wrap around to the rightmost side of the screen.

Req. 8. If S103 is pressed, then the plus moves to the right. If it reaches the rightmost side of the screen, it wraps around as well.

Req. 9. If S102 is pressed the + changes rows. If it was on row 0, it moves to row 1. If it was on row 1, it moves to row 0.

Req. 10. The code should be as compact as possible. Lab scores will be based on the size of the compiled object file. Smaller compiled code will result in a better score.

Lab Report

Include in the checkout part of your lab report the lines:

1. S101 works as specified in requirements _____
2. S102 works as specified in requirements _____
3. S103 works as specified in requirements _____
4. Structure defined in code as specified in requirements _____
5. Comments written as specified in requirements _____
6. Size of code (rank) _____/_____

Include in your lab report observations and procedure like the following:

The general learning objectives of this lab were . . .

The general steps needed to complete this lab were . . .

Some detailed steps to complete this lab were . . . .

1. *Step one*
2. *Step two*
3. *. . . .*

Code generated or modified to complete this lab...

No need to include all the files for the lab. Just include the modified code.

Some important observations while completing/testing this lab were . . .

Here include the memory report given at the end of the compile process (map file).
*We are **especially** interested in seeing the map file.*

In this lab we learned . . . .