

# CSE 3442/5442: Embedded Systems

## Lab 3: Simple I/O Circuit (GPIO)

May take two lab periods

### Objective:

The purpose of this lab assignment is to familiarize with connecting external I/O devices to the QwikFlash board.

### Problem Statement:

Write a program that will read two 4-bit numbers then display the result of an arithmetic or logic operation in the LCD according to control input values.

The program will read two numbers **B** and **C** from switches attached to the lower four pins of Port B and Port C of the PIC chip (where PortB0- PortB3 pins represent number B and PortC0-PortC3 pins represent number C). Use the 8 data switches from the IDL-800 and connect them to the board (do not forget to have a common grounding for the QwikFlash and the IDL). Then perform one of the operations stated in the following table depending on the values of PortB4 and PortB5 (use *SWA* and *SWB* on the IDL for that)

PortB4	PortB5	Operation
0	0	B + C
0	1	B - C
1	0	B AND C
1	1	NOT(B)

- For the arithmetic operations display the results in decimal
- For the logic operations display the results 4-bit binary format
- For the subtract operation, you should display the sign of the result

### Assignment:

The lab instructor will ask you to modify your program during the lab session to implement additional related operations.