

ECE 280 Lab 2

Fall 2005

The goal of this lab is to design a simple calculator. The project specifications are as follows:

Use BTN3 to reset the board. On reset, the 7-segment LED display should match the value of the switches. Note that the switches are 8-bit but the LED display is 16-bit, so the high 8 bits of the LED display will read **00**. You can input values to the calculator through the switches. Operations are specified with the buttons. BTN0, BTN1, and BTN2 correspond to '=', '+', and 'x' respectively. A sample sequence is shown below.

Action	LED Display
1. Switches= 0x01 , Press BTN3	0001
2. Press BTN1 (+)	0001
3. Press BTN0 (=)	0002
4. Press BTN2 (x)	0002
5. Switches= 0x06 , Press BTN0 (=)	000C
6. Switches= 0x06 , Press BTN0 (+)	0006
7. Switches= 0xFF , Press BTN0 (=)	0005
8. Press BTN0 (x)	0005
9. Switches= 0xFF , Press BTN0 (=)	FFF8

Things to be aware of:

You need to support negative numbers. That means you will have to sign extend the 8-bit input to a 16-bit number.

You will need to support using the result as an input to the next operation. For example, going from line 3 to line 4 in the example above.

If the display is showing the result of a previous operation, and you want to use the same input for the next operation, you will need to temporarily change the input value. For example, on line 6, the display is showing **000C**, but the switches have **06**. To input a **06**, we have to temporarily change the inputs, for example, to **07**, and then change the switches back to **06**.