Dept. of Computer Science and Engineering
CSE3201 – Digital Logic Design
Lab 6
Multiplexers

In this lab you will design a more complex circuit than you did before. You can use the modules you designed for previous labs to do this lab.
In this lab, you have to use a MUX to choose between the input/output choices.

Specifications

- The input to the circuit is as follows
  - 2 binary numbers in 2's complement format A on SW2..SW0 and B on SW5..SW3
  - Operation choice, SW6 and SW7 are used to determine the operation as follows
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$SW7$	$SW6$	Operation
0	0	Addition
0	1	$Subtraction(A-B)$
1	0	$Subtraction(B-A)$
1	1	Multiplication

  - SW8 is used to display the output as follows
    $$\begin{cases} SW8 = 1 & \text{The output is displayed as a decimal number on a 7 - seg. displays} \\ SW8 = 0 & \text{The output is displayed as a binary number (2's comp) on the LEDs} \end{cases}$$
- The input is represented as a 2's complement binary number
- The output is either a 2's complement binary format or a signed decimal number on 3 7-segment displays.
- You can convert from binary to decimal, or you can use special case to represent +12, -12, +16, and -16

Pre-Lab Work

Complete your design using Verilog, show the program to the TA before starting

Lab report
See the guidelines for the lab report on the Lab section of the course web page.
In your report you have to justify the design decisions you made in your design.