ECN-252 Lab 6

Like previous assignments, submit one zip file that includes your circuit, screenshot of results/saved figures, report with results/comments. Save the .zip file with your roll number, e.g., if your roll no. is 191112002, you need to submit 191112002.zip.

There are 8 sets of problem (4 for ECE, 4 for CSE). To select within set 1 - 4, use mod (Roll No.,4)+1 and select the corresponding problem from the table below.
[For example, if your roll no. is 191112002, you should select mod(191112002,4)+1 = 3; i.e. set 3.]

This lab we'll build on the of adder and multiplier circuits that you have previously designed in Lab 2 and Lab 5.

Part 1:
Understand the operation of signed multiplier (2's complement form) and implement the Bough-Wooley multiplier circuit. Test the circuit with given input combinations – see table below. (Bough-Wooley scheme will be explained during tutorial, also see link below for a nice tutorial)

Part 2:
Design a 4-bit comparator following the circuit in Section 4.8, Digital Design Book by Morris Mano. (Relevant book pages will be posted on Teams, explained during tutorial). Compare any two numbers to check that your design is working properly. Does this scheme work for signed integers in 2's complement form? If not, what changes do you need to make in the circuit to make it work for signed integers?

Group	Numbers to be multiplied in Part 1
ECE, Set 1	-3, 4
ECE, Set 2	7, -8
ECE, Set 3	-1, 7
ECE, Set 4	-2, -5
CSE, Set 1	-6, -7
CSE, Set 2	-7, -8
CSE, Set 3	2, -5
CSE, Set 4	4, -6

Link to a note with signed multiplier: (slide 8 has the same diagram as posted on teams)

http://web.mit.edu/6.111/www/f2017/handouts/L08_4.pdf