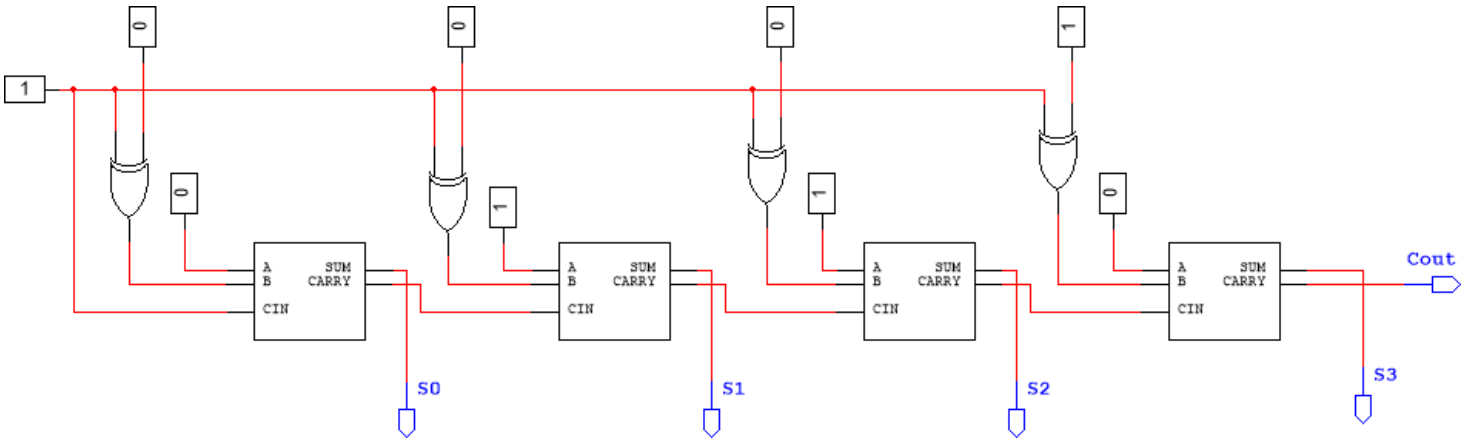
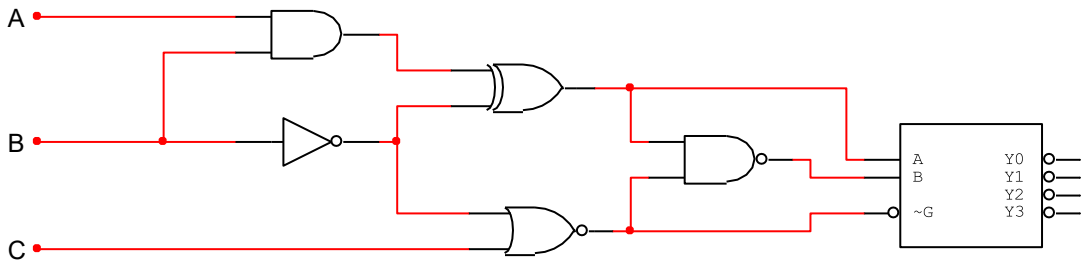
ESET 219 Homework 4

1. Using full adders and other logic gates necessary, draw the schematic for a 5 – bit adder/subtractor circuit than can do A + B and –A + B.

2. Given the following schematic
    a. What is the result of the sum in binary and decimal assuming **signed** math?
    b. Was there a carry out from the math operation?



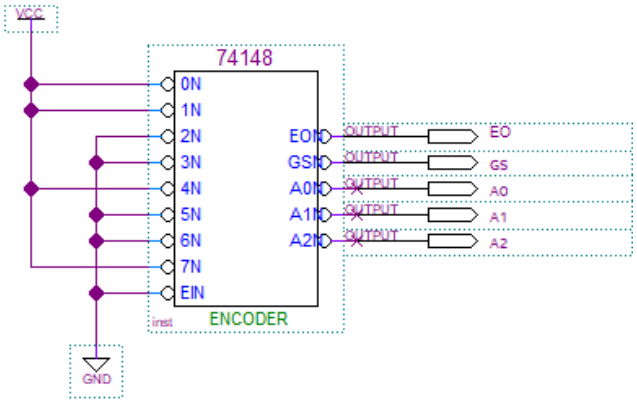
3. Given the following schematic, if decimal 3 is applied to the input, what output of the decoder is active? Assume C is the MSB on the input.



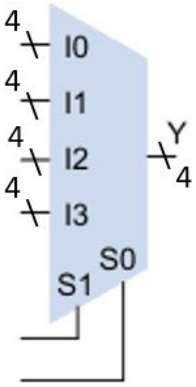
4. Implement F from following truth table using 2 x 4 decoders and other logic gates needed.

A	B	C	F
0	0	0	1
0	0	1	0
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	0
1	1	1	0

5. Given the following encoder schematic, what are the values of all the outputs?



6. Create the following using parallel multiplexers.



7. Implement the F from the following truth table using 4 input multiplexers and any necessary logic gates.

A	B	C	D	F
0	0	0	0	1
0	0	0	1	1
0	0	1	0	0
0	0	1	1	1
0	1	0	0	0
0	1	0	1	0
0	1	1	0	1
0	1	1	1	0
1	0	0	0	0
1	0	0	1	1
1	0	1	0	0
1	0	1	1	0
1	1	0	0	0
1	1	0	1	1
1	1	1	0	0
1	1	1	1	1

8. Using the following schematic for a 4 – bit comparator where A3 is MSB of input A and B3 is MSB of input B
    a. Cascade to create an 8 – bit comparator
    b. If input A is 0xA3 and input B is 0x1B, what is the value of every output of the cascaded comparator?