CSE 2600 - Homework 1

Always show all work for full credit.

1. Determine the largest (closest to $+\infty$) & smallest (closest to $-\infty$) values (in decimal) that can be represented with 6-bit number for each representation:

a. Sign/magnitude
   Largest:
   Smallest:

b. Unsigned
   Largest:
   Smallest:

c. Two's complement
   Largest:
   Smallest:

2. Fill in the missing values in the following table (assuming unsigned integer values):

Binary	Decimal	Hex
	42	
	217	
		CF
		90

3. Convert the following numbers to 8-bit, two's complement:
a. 56

b. -100

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4. Convert the following 8-bit, two's complement numbers to decimal:
a. 0001 1101

b. 1011 1010

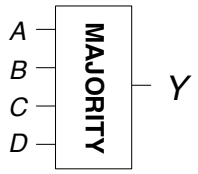
5. Perform the following additions of two's complement numbers (show work):

a. 1001 0111
+ 0011 0010

b. 0010 0101
+ 0100 0011

c. 0111 1111
+ 0000 0001

6. A majority gate produces a TRUE output if and only if more than half of its inputs are TRUE. Complete a truth table for the four-input majority gate shown (inputs are named A, B, C, and D. Output is named Y). ***Be sure to order the table using a binary-counting order, starting with A=0, B=0, C=0, D=0 in the first row, then A=0, B=0, C=0, D=1 in the second row, etc.***



7. Convert the following 8-bit two's complement numbers to 16-bit two's complement numbers with the same value.
a. 0001 1101

b. 1011 1010