

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 7-bit number for each representation. **Show the decimal interpretation of each.**

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	
	221	
		AC
		82

3. Convert the following numbers to 8-bit, two's complement (show the binary representation).

a. 92

b. -101

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

a. 0011 1001

b. 1011 0010

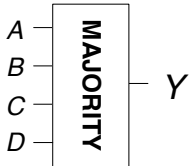
5. Perform the following additions of two's complement numbers (show work, including carries):

a. 1001 0111
+ 0011 0100

b. 0011 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 (show final answers in binary).

a. 0011 1001

b. 1001 1110