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I pledge my honor that I have abided by the Stevens Honor System.

Quick Check 1.1

1a) True, The same sequence of bits may be signed or unsigned which changes the value of the decimal conversion ex: 1001b if unsigned equals 5 in base 10 decimal but 1001b if it is signed is -7 in base 10 decimal.

1b) False, if you were to interpret the 4 bit twos complement 1000b, which is equivalent to -8 in decimal, you would see that the unsigned representation is +8 which is not greater than the twos complement representation.

2a) Unsigned: The largest integer representable by an 8 bit integer unsigned is 255 if you added 1 to this number you would get the value of 2^8 = 256 (not representable in 8 bits)
Signed: The largest integer representable by an 8 bit integer in twos complement is 127 if you added 1 to this number you would get is 128 (not representable in twos complement)

2b)

- 0 represented unsigned = 00000000
- 0 represented twos complement = 00000000
- -1 is not representable in unsigned
- -1 represented in twos complement = 11111111
- 1 represented unsigned = 00000001
- 1 represented twos complement = 00000001

2c)

- 17 represented unsigned = 00010001
- 17 represented twos complement = 00010001
- -17 cant be represented unsigned
- -17 represented twos complement = 11101111

3a) 0 to 256 needs 9 bits to be represented in unsigned

3b) -7 needs 4 bits to be represented in twos complement and 56 needs 7 bits so -7 to 56 needs 7 bits to be represented in twos complement

3c) 64 to 127 needs 7 bits to be represented in unsigned
-64 to -127 needs 7 bits to be represented in twos complement

3d) 2^40 * 8 * 12 bits to represent 12 TB

Quick Check 1.2

False you cannot get an overflow error when adding two signed numbers of different signs.

Quick Check 1.3

Logical Shift left 4 bits to convert the binary to 0101 0000
Then logical shift right 4 bits to convert it to 0000 0101
This preserves the correct bits in the correct order