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CPSC 260: Assignment #4

Textbook Practice Problems

2.14)

Expression	Value		Expression	Value
x & y	0x20		x && y	0x01
x | y	0x7F		x || y	0x01
~x | ~y	0xDF		!x || !y	0x00
x & !y	0x00		x && ~y	0x01

$$x = 0x66 = 0110|0110 = 01100110$$
$$y = 0x39 = 0011|1001 = 00111001$$

```
  01100110          01100110              10011001
& 00111001        | 00111001            | 11000110
  0010|0000 = 0x20  0111|1111 = 0x7F      1101|1111
```

```
  01100110
& 00000000      1 && 1 = 1      0 || 0 = 0
  00000000      1 || 1 = 1      1 && 1 = 1
```

2.15)   x == y   using bit-level and logic ops

XOR: ^

x	y	x^y
0	1	1
1	0	1
1	1	0
0	0	0

} same val

$$\boxed{!(x \wedge y)}$$

so opposite output of XOR

2.16)

x		x << 3		x >> 2 (logic)		x >> 2 (arithmetic)	
Hex	Binary	Hex	Binary	Hex	Binary	Hex	Binary
C3	11000011	0x18	00011000	0x30	00110000	0xF0	11110000
75	01110101	0xA8	10101000	0x1D	00011101	0x1D	00011101
87	10000111	0x38	00111000	0x21	00100001	0xE1	11100001
66	01100110	0x30	00110000	0x19	00011001	0x19	00011001

8 4 2 1

bit right →
fill zero

bit right →
fill w/ most left #

	Signed	Unsigned
Min. Value	$-[(2^{32}/2)-1]$	0
Max. Value	$(2^{32}/2)-1$	$2^{32}-1$
Symmetric Range	Yes	No

==1-Byte Signed Integers==

Decimal	Binary	Hex	2's Complement
27	00011011	0x1B	11100101
73	01001001	0x49	10110111
56	00111000	0x38	11001000
1	00000001	0x01	11111111
0	00000000	0x00	00000000

$$\overline{128}\ \ \overline{64}\ \ \overline{32}\ \ \overline{16}\ \ \overline{8}\ \ \overline{4}\ \ \overline{2}\ \ \overline{1}$$

$73 - 64 = 9 - 8 = 1 - 1 = 0$

$56 - 32 = 24 - 16 = 8 - 8 = 0$

$\sim 73 = 10110110$

$\sim 56 = 11000111$

$\sim 1 = 11111110$

$\sim 0 = 11111111$

2's Complement: bitwise NOT plus 1

$128 + 64 + 4 + 2 + 1$

$= 192 + 7 = 199$

$199 + 1 = 200 - 192 = 8$