CSE 2130

Daniel Delgado Acosta

2-13-22

HW 1

2.8 a.) The largest positive 8-bit 2's complement code is;

Binary: $\boxed{(01111111)_2}$

Decimal: $\boxed{127}$

b.) The greatest magnitude negative 8-bit 2's;

Binary: $\boxed{(10000000)_2}$ Decimal: $\boxed{-128}$

c.) largest positive in n-bit 2's: $\boxed{2^{n-1}-1}$

d.) greatest magnitude negative in n-bit 2's: $\boxed{-2^{n-1}}$

2.10 convert to decimal

b.) $\overset{}{0}\overset{64}{1}0\overset{16}{1}\overset{8}{1}0\overset{2}{1}0 = 64+16+8+2 = \boxed{90}$

c.) $\overset{(-)}{1}1111110 \Rightarrow 000000\overset{2}{1}0 = \boxed{-2}$

2.11 convert to 2's complement binary

a.) $102 = \boxed{0110\ 0110}$

d.) $-128 = \boxed{1000\ 0000}$

2.26 express -64 as a 2' complement number: 1000000

a.) The minimum number of bits needed:

$\boxed{7 \text{ bits}}$

b.) The Largest positive number with 7-bits:

$0111111 = 32+16+8+4+2+1 = \boxed{63}$

c.) The largest unsigned number with 7-bits:

$1111111 = 64+63 = \boxed{127}$

Compute the following:

2.33 a.) 0101 0111 OR 1101 0111 → $\boxed{1101\ 0111}$

f.) 0101 OR (1100 OR 1101)

1100 OR 1101 → 1101 => 0101 OR 1101

→ $\boxed{1101}$

Write IEEE floating point representation to the following:

2.39 a.) 3.75 $\xrightarrow{binary}$ 011 + .75 $\xrightarrow{binary}$ ×2 = 1.50
.5×2 = 1.00

20 zeroes

=> $(011.11)_2$ $\xrightarrow{IEEE}$ $\boxed{0\ 10000000\ 11100000000000000000000}$

b.) $-55\frac{23}{64} = -55.359$, 55 $\xrightarrow{binary}$ 110111
0.359 $\xrightarrow{binary}$ .0101

$\xrightarrow{binary}$ $(110111.0101)_2$

$\xrightarrow{IEEE}$ $\boxed{1\ 10000100\ 10111010000000000000000}$

Write the following IEEE floating point numbers into decimal:

2.40 a.) 0 10000000 00000000000000000000000

positive exponent = 128

decimal $= (\text{sign})(1.\text{fraction}) \times 2^{exp-127} = 2$

decimal: $\boxed{+2}$

b.) 1 1000 0011 00010000000000000000000

negative exp = 131

decimal = −17

decimal: $\boxed{-17}$

3.15 Fill in truth table; what single logic gate has the same truth table

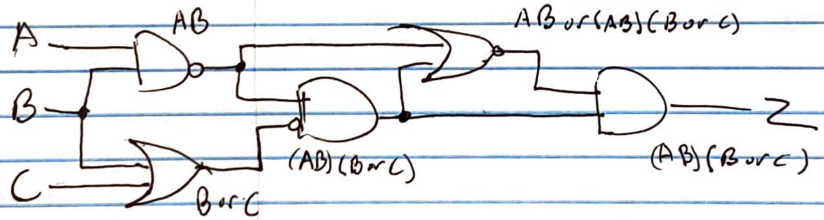
A	B	NOT(NOT(A) OR NOT(B))
0	0	0
0	1	0
1	0	0
1	1	1

single logic gate with same results: A AND B

3.16 Fill in the truth table for a two-input NOR gate.

A	B	A NOR B
0	0	1
0	1	0
1	0	0
1	1	0

3.29 Given the logic circuit in Figure 3.41, fill in the truth table for the output value Z



A ~~B C AB~~