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Homework 6
10/22/2105
CSE 278

B.11 [5] ¡4.2, B.2, B.3¿ Assume that X consists of 3 bits, x2 x1 x0. Write four logic functions that are true if and only if

- X contains only one 0

$F = \overline{x}_2 \cdot x_1 \cdot x_0 + x_2 \cdot \overline{x}_1 \cdot x_0 + x_2 \cdot x_1 \cdot \overline{x}_0$

x_2	x_1	x_0	result
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	1
1	0	0	0
1	0	1	1
1	1	0	1
1	1	1	0

- X contains an even number of 0s

$F = \overline{x}_2 \cdot \overline{x}_1 \cdot x_0 + x_2 \cdot \overline{x}_1 \cdot x_0 + \overline{x}_2 \cdot x_1 \cdot x_0 + x_2 \cdot x_1 \cdot x_0$

x_2	x_1	x_0	result
0	0	0	0
0	0	1	1
0	1	0	1
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	1

- X when interpreted as an unsigned binary number is less than

$F = \overline{x}_2$

x_2	x_1	x_0	result
0	0	0	1
0	0	1	1
0	1	0	1
0	1	1	1
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	0

- X when interpreted as a signed (twos complement) number is negative

$F = x_2$

x_2	x_1	x_0	result
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	1
1	1	0	1
1	1	1	1

B.14 [5] ¡B.2, B.3¿Implement a switching network that has two data inputs (A and B), two data outputs (C and D), and a control input (S). If S equals 1, the network is in pass-through mode, and C should equal A, and D should equal B. If S equals 0, the network is in crossing mode, and C should equal B, and D should equal A.