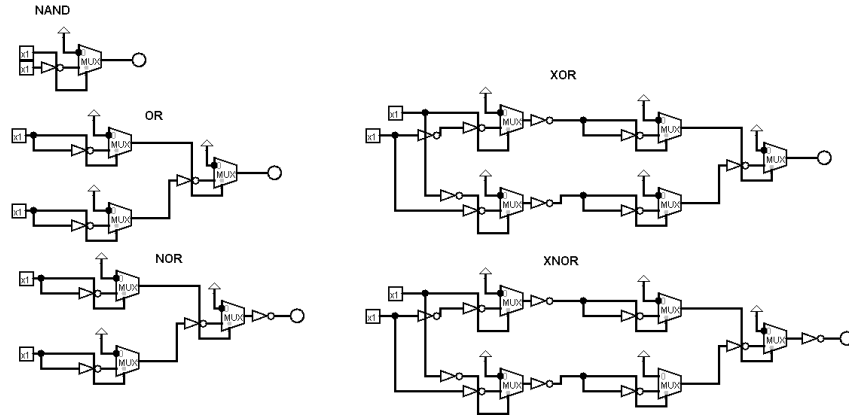


# CS281 Homework 4

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1. OR, XOR, NAND, NOR, and XNOR:



2.  $f_1 = (\overline{x_2} \cdot x_1 \cdot x_0) + (x_2 \cdot \overline{x_1} \cdot x_0) + (x_2 \cdot x_1 \cdot \overline{x_0})$

$$f_2 = (\overline{x_2} \cdot \overline{x_1} \cdot x_0) + (\overline{x_2} \cdot x_1 \cdot \overline{x_0}) + (x_2 \cdot \overline{x_1} \cdot \overline{x_0}) + (x_2 \cdot x_1 \cdot x_0)$$

$$f_3 = (\overline{x_2} \cdot \overline{x_1} \cdot \overline{x_0}) + (\overline{x_2} \cdot \overline{x_1} \cdot x_0) + (\overline{x_2} \cdot x_1 \cdot \overline{x_0}) + (\overline{x_2} \cdot x_1 \cdot x_0)$$

Alternatively,  $f_3 = \overline{x_2}$

$$f_4 = (x_2 \cdot \overline{x_1} \cdot \overline{x_0}) + (x_2 \cdot \overline{x_1} \cdot x_0) + (x_2 \cdot x_1 \cdot \overline{x_0}) + (x_2 \cdot x_1 \cdot x_0)$$

Alternatively,  $f_4 = x_2$

$x_2$	$x_1$	$x_0$	$f_1$	$f_2$	$f_3$	$f_4$
0	0	0	0	0	1	0
0	0	1	0	1	1	0
0	1	0	0	1	1	0
0	1	1	1	0	1	0
1	0	0	0	1	0	1
1	0	1	1	0	0	1
1	1	0	1	0	0	1
1	1	1	0	1	0	1