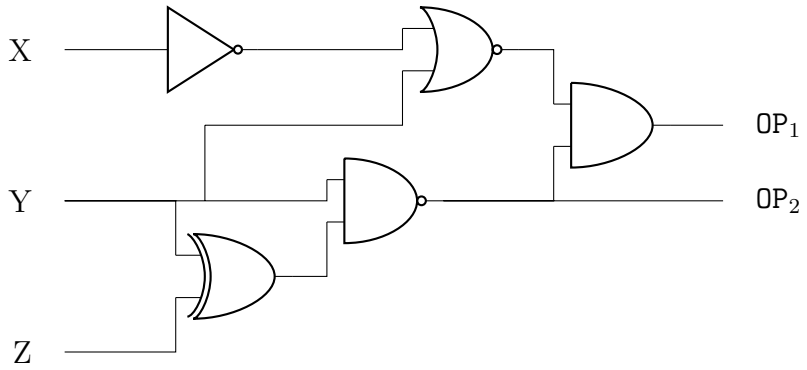
CS 31 Homework 2: Circuits

Due Thurs, Feb 13th at the beginning of class

Your Name(s)/Lab Section(s):

1. Fill in the truth table for the following circuit. Note that this circuit is using NOT, XOR, NOR, NAND, and AND gates.

x	y	z	OP$_1$(x, y, z)	OP$_2$(x, y, z)
0	0	0		
0	0	1		
0	1	0		
0	1	1		
1	0	0		
1	0	1		
1	1	0		
1	1	1		



2. Construct a circuit that implements the following truth table. You may use any of the following one- or two-input gates: `NOT`, `AND`, `OR`, `XOR`, `NAND`, `NOR`, `XNOR`. Write out the boolean expression for OP1 and OP2 before attempting to draw the circuit. HINT: try to come up with a shorter boolean expression by considering the output values for when x is 1, and then for when x is 0.

x	y	z	$\texttt{OP}_1$(x, y, z)	$\texttt{OP}_2$(x, y, z)
0	0	0	0	0
0	0	1	1	1
0	1	0	1	1
0	1	1	1	0
1	0	0	0	0
1	0	1	0	1
1	1	0	0	1
1	1	1	0	1