

ECE 130 HW#2 (due Monday, 3/15/2004)

1. Recall the turn-signal circuit from class. Consider the following specifications:

- The left and right inputs take precedence over the hazard input
- The left and right inputs are exclusive and cannot be simultaneously active
- The outputs of the circuit will instruct a blinking circuit to turn on
- The left light should turn on when the left input is asserted and the right light should turn on when the right input is asserted
- Both inputs should turn on when the hazard input is asserted

A. Fill in the truth table below for a digital circuit that meets the above specifications. Hint: place an “x” in any box where you “don’t care” what the output is...

L	R	H	LL	RL
0	0	0	0	0
0	0	1	1	1
0	1	0	0	1
0	1	1	0	1
1	0	0	1	0
1	0	1	1	0
1	1	0	X	X
1	1	1	X	X

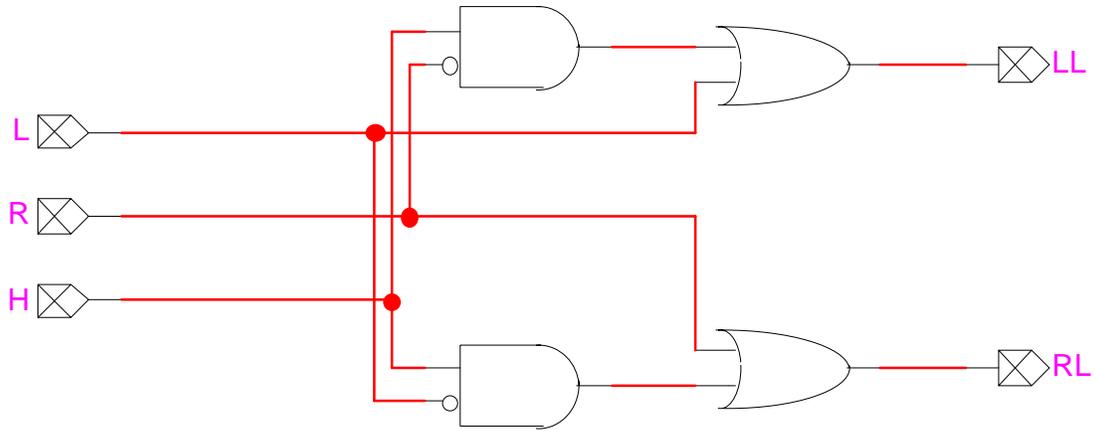
B. Write logical expressions for **LL** and **RL** in terms of **L**, **R**, and **H**. Verify that your expression will produce your truth table.

$$LL = L + (R' * H) = L + (R + H)'$$

$$RL = R + (L' * H) = R + (L + H)'$$

etc.

C. Draw a schematic that relates the inputs and outputs for your above expressions. You may only use AND, OR, and NOT (inverter) gates.



etc.