



EE 302 Problem Set 15

1. Truth Tables: Give the name of the following logic gates and create a truth table for each.

a. 

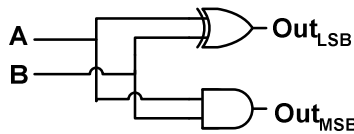
b. 

c. 

d. 

a. NOT (a.k.a. “inverter”); b. AND; c. NOR; d. XOR

2. XOR with AND gate: Fill in the truth table for the digital logic circuit shown.



A	B	Out _{MSB}	Out _{LSB}
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

3. Investigation of Results: Perform the following binary additions.

Note, here the symbol “+” is used to mean “add;” in other words “+” specifically does not denote the logical “OR” operation in this context.

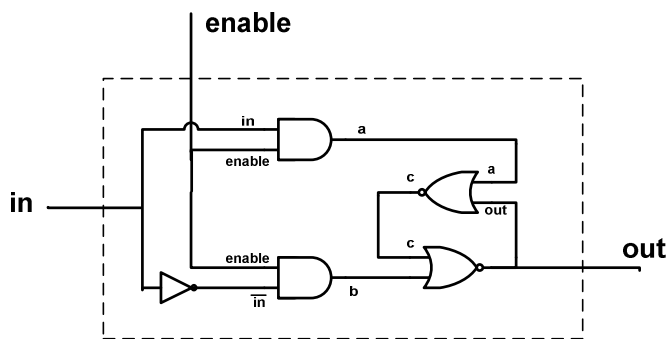
a. Find $1 + 0 = 1$

b. Find $1 + 1 = 10$

c. Compare the results of (a) and (b) above to the table from (2). What is the circuit in (2) doing?

The circuit in (2) is an adding circuit, or “binary adder”.

4. A Memory Element: Using your knowledge of basic logic gates, fill in the truth table below. Work from left to right. A few entries have been made for you.



enable	Out	in	$\overline{\text{in}}$	a	b	C	Out
0	0	0	1	0	0	1	0
0	0	1	0	0	0	1	0
0	1	0	1	0	0	0	1
0	1	1	0	0	0	0	1
1	0	0	1	0	1	1	0
1	0	1	0	1	0	0	1
1	0	0	1	0	1	1	0
1	1	1	0	1	0	0	1