ECE255 – Introduction to Logic Design of Digital Systems
Homework Assignment 1
Due September 1

Name: Isaac Abdlen

When filling in truth tables, label the rows systematically as done in class, with all 0's and 1's. Each row, for each possible input combination should show the proper 0 or 1 output value. Note that some input combinations are missing. You must also fill in all missing input combinations.

Exclusive-OR is an XOR and we use $\oplus$ as the operator symbol. The XOR function can be written:

$$A \oplus B = AB' + A'B$$

Fill in the seven truth tables and answer the two questions below:

		OR Gate	* XOR (or)	XOR	XOR	XOR or XOR	XOR (XOR)	XOR (XOR)
	$A\ B\ C$	$B+C$	$A\oplus(B+C)$	$A\oplus B$	$A\oplus C$	$(A\oplus B)+(A\oplus C)$	$(A\oplus B)\oplus C$	$A\oplus(B\oplus C)$
0	0 0 0	0+0=0	0⊕(0)=0	0⊕0=0	0⊕0=0	0+0=0	0⊕0=0	0⊕0=0
1	0 0 1	0+1=1	0⊕(1)=1	0⊕0=0	0⊕1=1	0+1=1	0⊕1=1	0⊕1=1
2	0 1 0	1+0=1	0⊕(1)=1	0⊕1=1	0⊕0=0	1+0=1	1⊕0=1	0⊕1=1
3	0 1 1	1+1=1	0⊕(1)=1	0⊕1=1	0⊕1=1	1+1=1	1⊕1=0	0⊕0=0
4	1 0 0	0+0=0	1⊕(0)=1	1⊕0=1	1⊕0=1	1+1=1	1⊕0=1	1⊕0=0
5	1 0 1	0+1=1	1⊕(1)=0	1⊕0=1	1⊕1=0	1+0=1	1⊕1=1	1⊕1=1
6	1 1 0	1+0=1	1⊕(1)=0	1⊕1=0	1⊕0=1	1+0=1	0⊕0=0	1⊕1=1
7	1 1 1	1+1=1	1⊕(1)=0	1⊕1=0	1⊕1=0	0+0=0	0⊕1=1	1⊕0=1
	4 2 1							

Circle the answers that your truth tables prove:

Does $\oplus$ distribute through +? YES (NO)

Is $\oplus$ associative? (YES) NO

Is xor associative?

only 1 can be true.