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CNIT 176 Lab 05

09/28/2022

Three Input AND

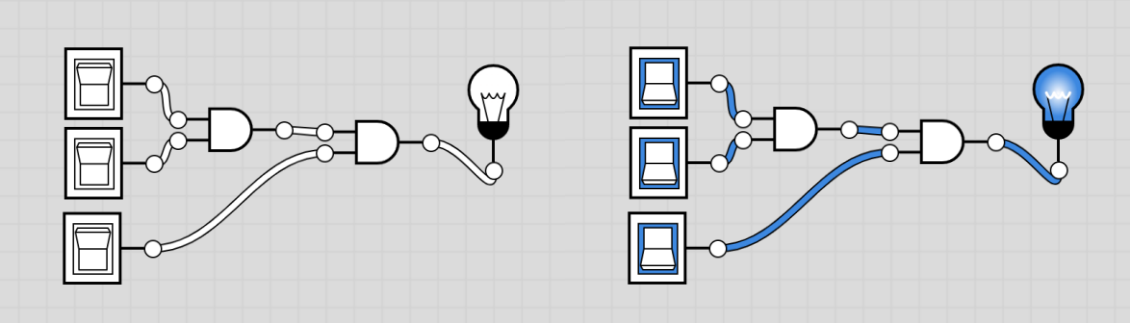

Figure 1: Three Input AND Gate

X	Y	Z	X^Y^Z
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	0
1	0	1	0
1	1	0	0
1	1	1	1

Figure 2: Three Input AND Truth Table

NAND & NOR

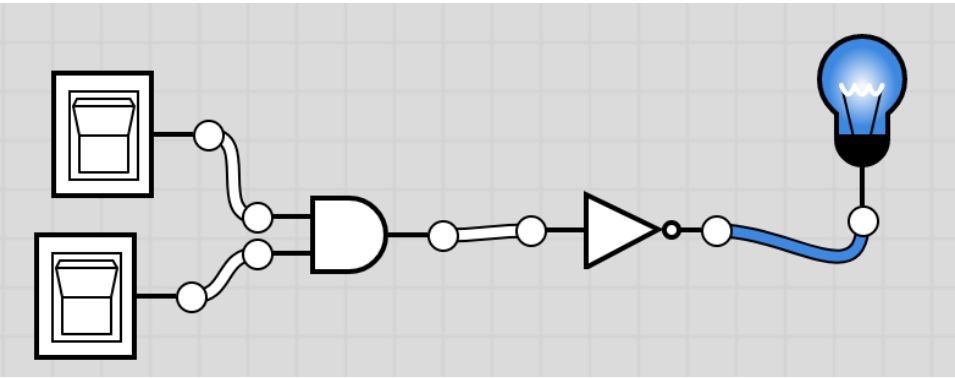

Figure 3: NAND Gate

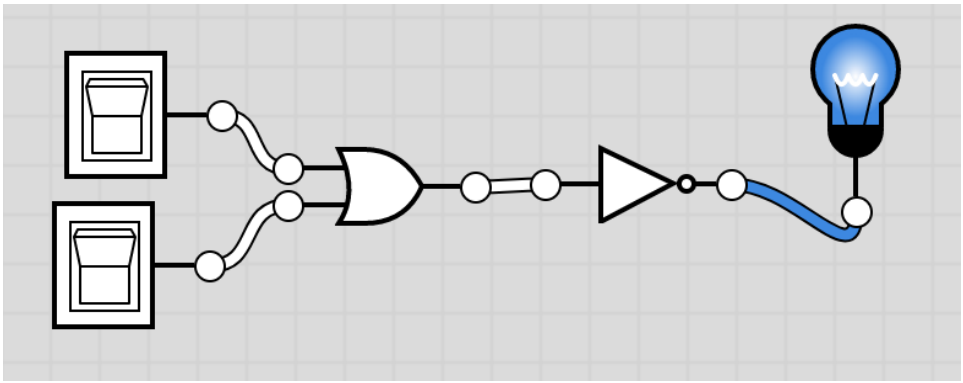

Figure 4: NOR Gate

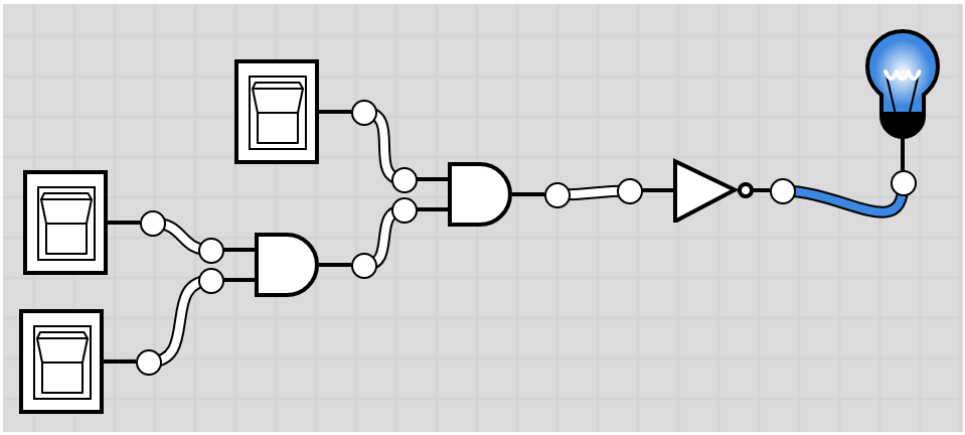

Figure 5: 3 Input NAND Gate

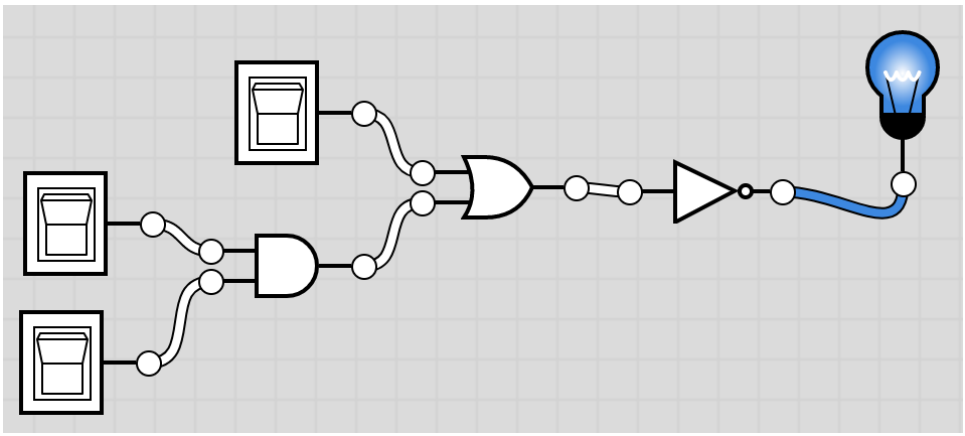

Figure 6: 3 Input NOR Gate

DeMorgan's Law states (xy)' = x' + y' and (x + y)' = x'y'. These results relate to DeMorgan's Law by showing the complement of a function, NAND is equivalent to an AND gate with inverted inputs as can be seen in figures 3 and 5. Similarly, a function, NOR is equivalent to an OR gate with inverted inputs as

seen in figures 4 and 6. The two representations are logically equivalent and can be used interchangeably with similar truth tables.

Non-Inverting Buffer

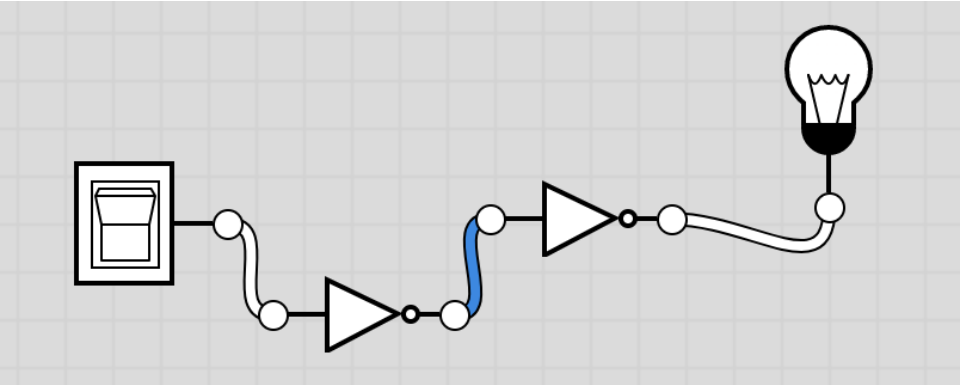

Figure 7: Non-Inverting Buffer

The circuit in figure 7 works as a non-inverting buffer according to the Boolean law which states that anything complemented twice is equal to the original. In this case, the input of 0 is inverted once to return 1, then inverted again to return the original state of 0.