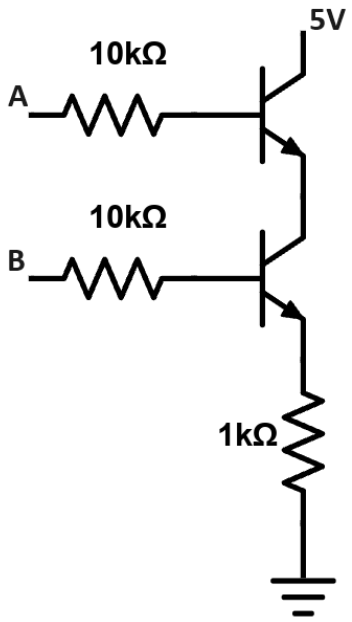
EN-3212 Electronics

Introduction to Logic Gates

In lecture, we've discussed how it can be used in the linear mode at length and we saw how to use an integrated circuit (the op-amp) that incorporated the Class A amplifier that we discussed. Let's discuss a few different applications for the transistor.

In this part of our discussion, we talked about the fact that we could only put 0V or 5V at A and B. Draw a table to remind yourself of when you'll see a 5V drop across the 1kΩ resistor. What kind of logic gate is this?



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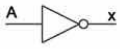
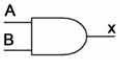
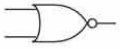
We looked at one integrated circuit (the AND gate) that made use of the transistor as a switch. Now, we're going to take a look at a few more ICs like the AND gate, and we'll see how to use them to do some interesting things.

Logic Gates

Name	NOT	AND	NAND	OR	NOR	XOR	XNOR
Alg. Expr.	$\overline{A}$	AB	$\overline{AB}$	$A+B$	$\overline{A+B}$	$A \oplus B$	$\overline{A \oplus B}$
Symbol							
Truth Table	A | X 0 | 1 1 | 0	B A | X 0 0 | 0 0 1 | 0 1 0 | 0 1 1 | 1	B A | X 0 0 | 1 0 1 | 1 1 0 | 1 1 1 | 0	B A | X 0 0 | 0 0 1 | 1 1 0 | 1 1 1 | 1	B A | X 0 0 | 1 0 1 | 0 1 0 | 0 1 1 | 0	B A | X 0 0 | 0 0 1 | 1 1 0 | 1 1 1 | 0	B A | X 0 0 | 1 0 1 | 0 1 0 | 0 1 1 | 1

In the table above, what do the 0s and 1s indicate?

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Let us try building a table and filling it out for the following logic circuit.