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Development
of Canada

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Logic Gates

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What is A Logic Gate?

- Digital Computers that we know and love contain transistors, that act as a switch
- Each switch has an on or off position
- Computer scientists represent this position of on and off as 1 and 0
- This is the language that computers speak which is represented as binary

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What is A Logic Gate?

- If you recall back to the first week we talked about bits nibbles and bytes. An individual bit can either be 1 or 0
- Computers don't just store the data that is going into each bit, it is also being processed
- Information is processed from an input into an output

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What is A Logic Gate?

- Logic gates are what we use to process our data
- They take inputs and produce outputs depending on the rules or logic that is used
- Logic gates are both abstract concepts and real processes that allow computer systems to make “decisions”

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What is A Logic Gate?

- The basic logic gates include:
- AND
- OR
- NOT
- NAND
- NOR
- XOR
- XNOR

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What is A Logic Gate?

- https://www.youtube.com/watch?v=zcsmHkKJgbE&ab_channel=3DSage

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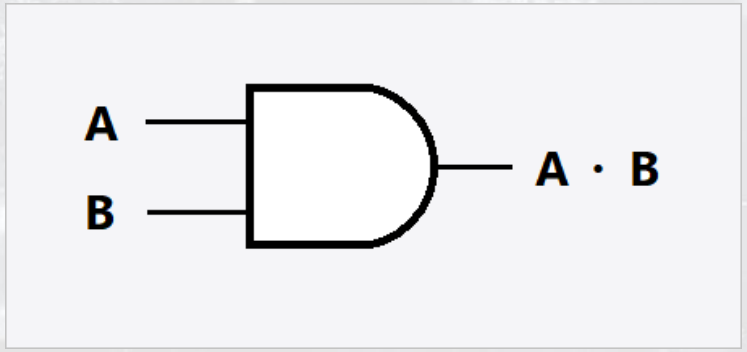
AND GATE

- AND gates have two inputs. Both inputs must be a 1 (1,1) for us to output a 1. All other inputs (1,0) or (0,1)or (0,0) will output a 0



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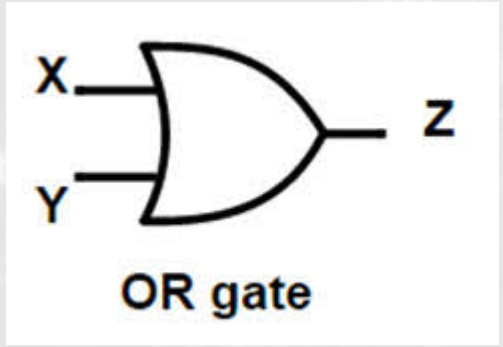
OR GATE

- OR gates have two inputs. Unlike the AND gates OR gates can have (1,0) or (0,1) or (1, 1) as inputs and output a 1. The only input that will output a 0 is (0,0)



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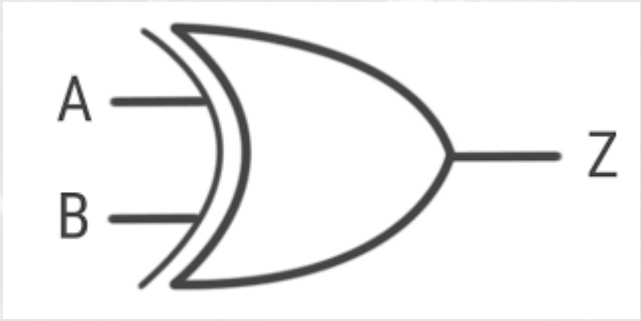
XOR gate (exclusive or)

- XOR gates output a 1 only when there the logic is (1,0) or (0,1). All others (0,0) and (1,1) will output a 0



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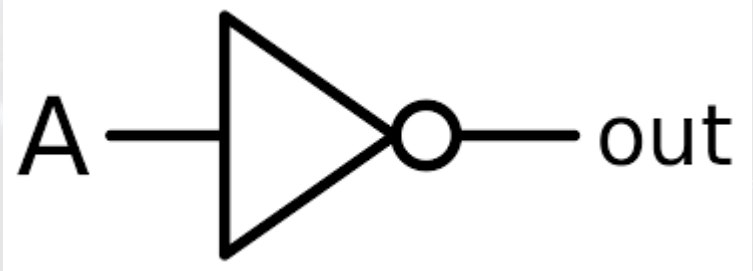
Not gate

- NOT gates have one input and one output. Not gates work by outputting the opposite of what is input. If there is a 1 input, the output will be 0. if there is a 0 input then it inverts it and outputs a 1



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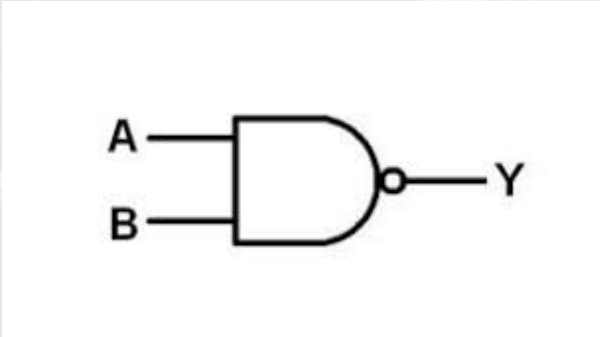
NAND gate

- NAND gates invert AND gates. NAND gates will take in (1,1) then will invert it to a 0. When there is any other input (1,0) and (0,1) and (0, 0) it will output a 1



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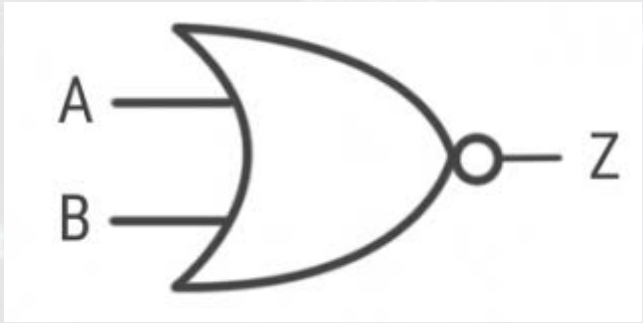
NOR gate

- NOR gates invert OR gates. Input (1,0) or (0,1) or (1,1) the output will be 0. The only Input that will output a 1 is (0,0)



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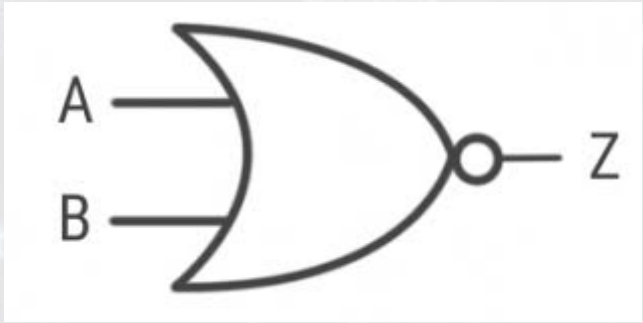
XNOR GATE

- XNOR gates invert NOR gates. Input (1,0) or (0,1) the output will be 0. Input (0,0) or (1,1) and the output will be 1. this is exclusively not or



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From the ITD Canada team!!!