Now that we are familiar with the individual logic gates and their truth conditions we are in a position to create **logic circuits**. These are combinations of logic gates controlled by inputs that can provide a range of useful outputs.

Basic example

In the below circuit we have the following gates connected to two inputs with one output, moving through the following stages:
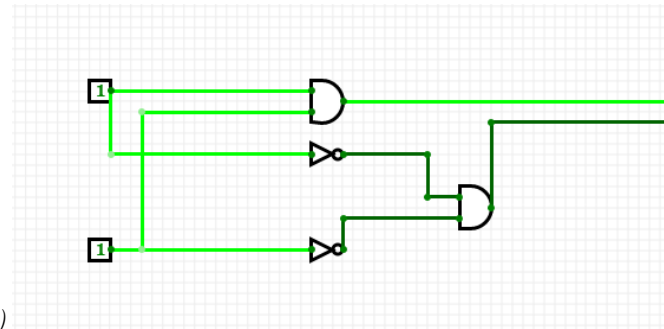
1. `AND, NOT , NOT`
2. `AND, NOR`

This is equivalent to the following truth table:

```
A    B    Output

-    -    -----

0    0     0          (1)
1    0     1          (2)
0    1     1          (3)
1    1     0          (4)
```


Line 1 of the truth table

Line 2 and 3 of the truth table (equivalent to each other)
Line 4 of the truth table

Applied example

With this circuit we have a more interesting applied example.

It corresponds to an automatic sliding door and has the following states

- a proximity sensor that opens the doors when someone approached from outside
- a proximity sensor that opens the doors when someone approaches from the inside
- a manual override that locks both approaches (inside and out) meaning no one can enter of leave

Here's a visual representation:! logic_circuits_5.gif The following truth table represents this behaviour, with A and B as the door states, C as the override and X as the door action (0 = open, 1 = closed)

```
A  B  C  X

-  -  -  -

0  0  0  0
1  0  0  0
0  1  0  0
1  1  0  0
0  0  1  0
1  0  1  1
0  1  1  1
1  1  1  1
```

2

Automatic door sensor with manual override