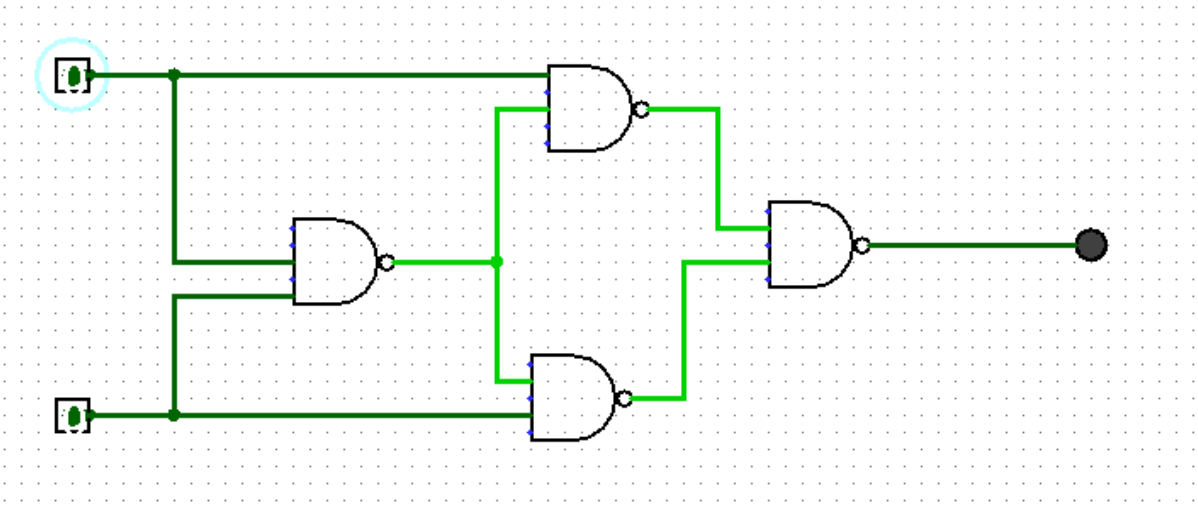
CS1026

Lab #1

Jakub Slowinski

Student number:16319781

Design an XOR using NAND gates • Implement: F(X, Y ) = X ⊕ Y



NAND gate logic

| Inputs | | Output |
|---|---|---|
| A | B | Y |
| 0 | 0 | 1 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

XOR gate logic

| Inputs | | Output |
|---|---|---|
| A | B | Y |
| 0 | 0 | 0 |
| 0 | 1 | 1 |
| 1 | 0 | 1 |
| 1 | 1 | 0 |

The logic NAND Gate is a.combination of the digital logic AND gate with that of an invertor or NOT gate connected together in series.

The XOR gate uses a combination of 4 NAND gates.

The LED lights up when the output comes to 1. This happens when one of the inputs is 1 while the other is 0.

A.B’ + A’.B is the algebraic expression for a XOR gate.