

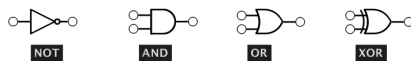
Assignment #1 - Logic Discrete Mathematics

Anders Kalhauge

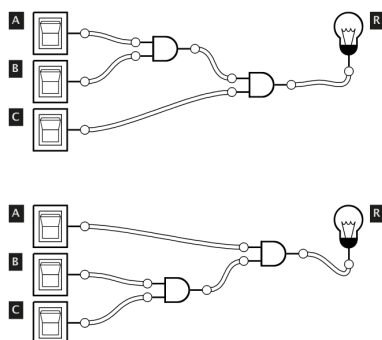
Fall 2017

1 Equivalence laws

In digital electronics the following gates implements logical statements:



Write a diagram for each of the laws of equivalence, ie.:



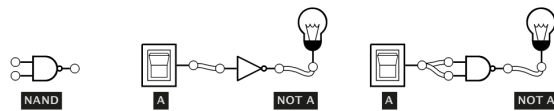
$$(a \wedge b) \wedge c \equiv a \wedge (b \vee c)$$

2 Nand

The simplest logic circuit to create is a nand gate. It has the following truth table and is equivalent to $\neg(a \wedge b)$:

a	b	$\neg(a \wedge b)$
f	f	t
f	t	t
t	f	t
t	t	f

Nand has the special property, that any other binar operator can be build from NAND, here the NAND gate is shown and the implementation of **not**:



Build the operators **and**, **or**, **xor**, and **implies** with NAND gates alone.

Hand in

Individually on Moodle by Friday 8th

<http://logic.ly>