

Comments on 7bit Half Adder program

Tu 18 Oct 2018

All C prog. Starts at main section

C is a typed language

↳ We have $\neq$ "types" of objects/variables

Example: Integers, characters, bool,
Strings, floats, long, unsigned

int (assume 8 bits)
(it's not: Nowadays
usually 1 int = 4 Bytes)

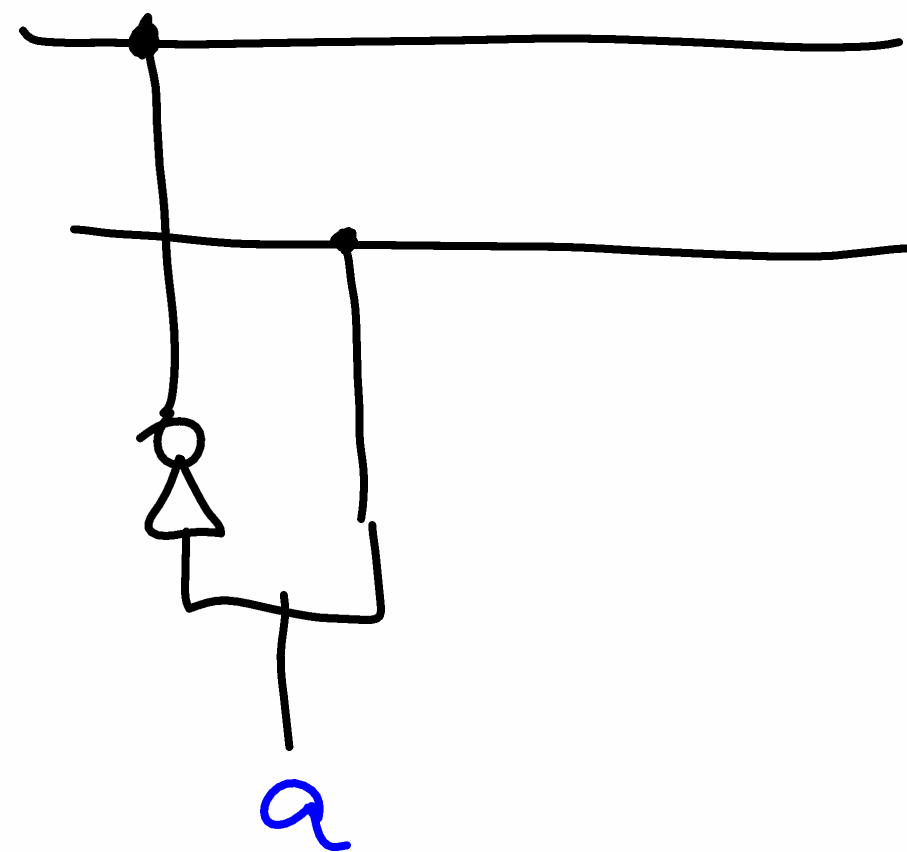
$$\begin{aligned} a = 1 &\Rightarrow 0010 & 0010 \\ b = 0 &\Rightarrow 0000 & 0010 \\ a \wedge b &\Rightarrow 0110 & 1101 \\ a \& b &\Rightarrow 0000 & 0010 \end{aligned}$$

Binary Decoder

How does a computer count?

How does it know $b1011 = 1d11$

1-bit decoder



When will these lines be 1

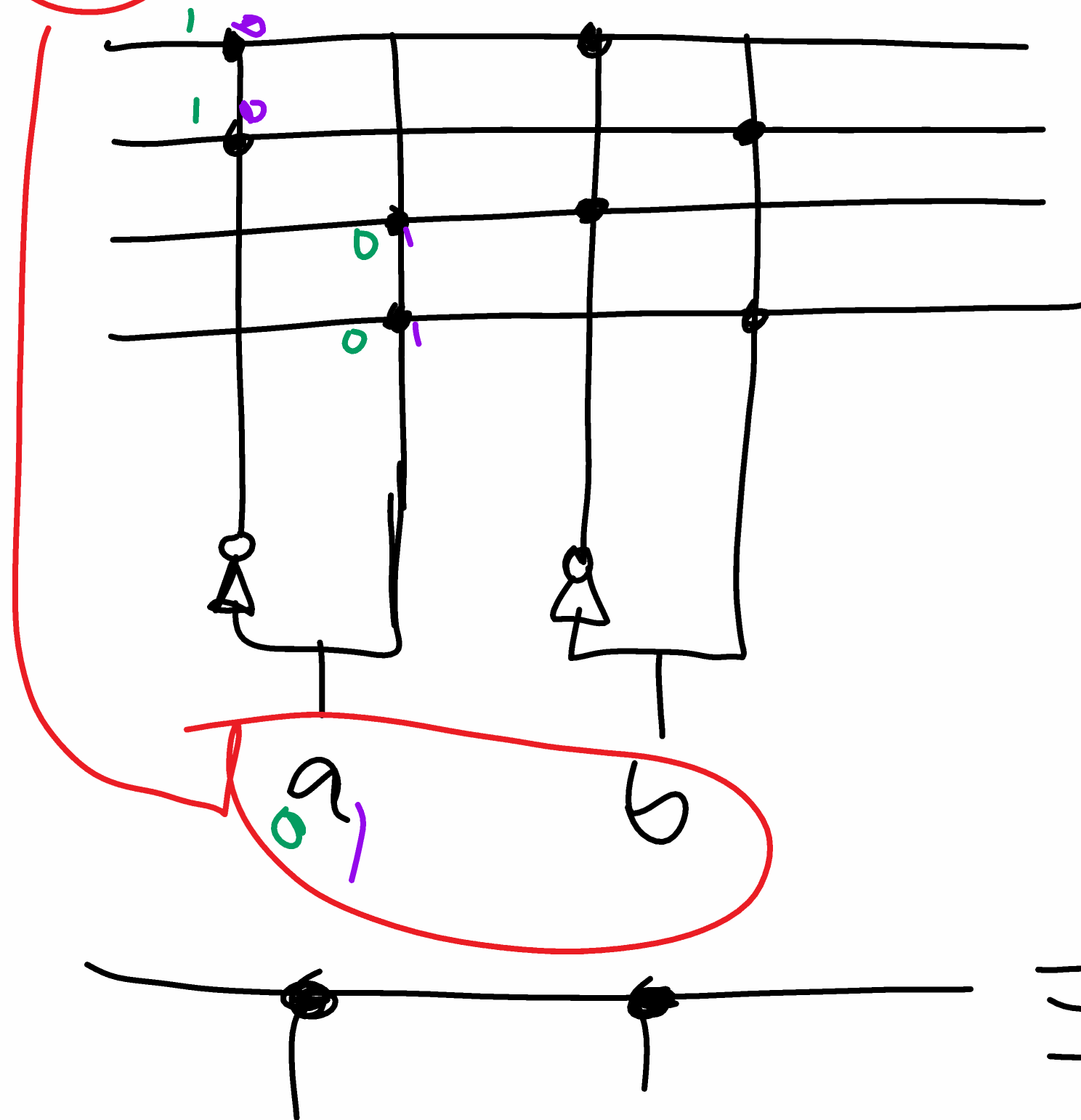
$\neg a$

$a = 0$

a

$a = 1$

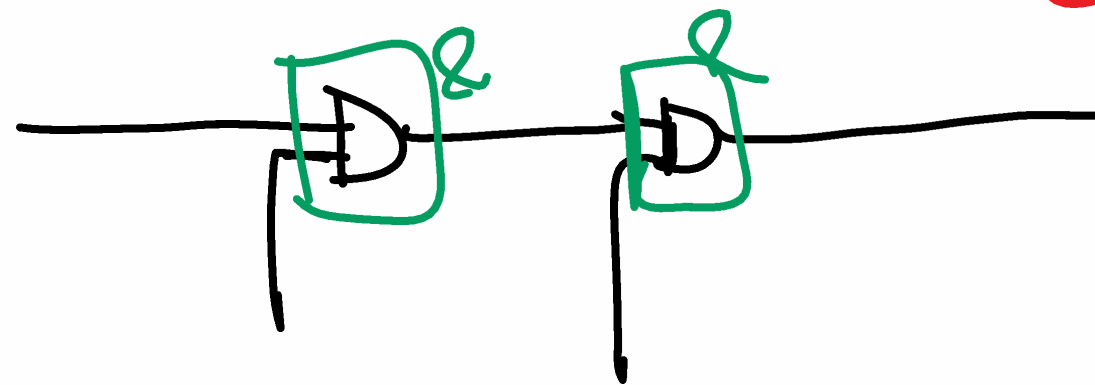
2-bit Binary Decoder



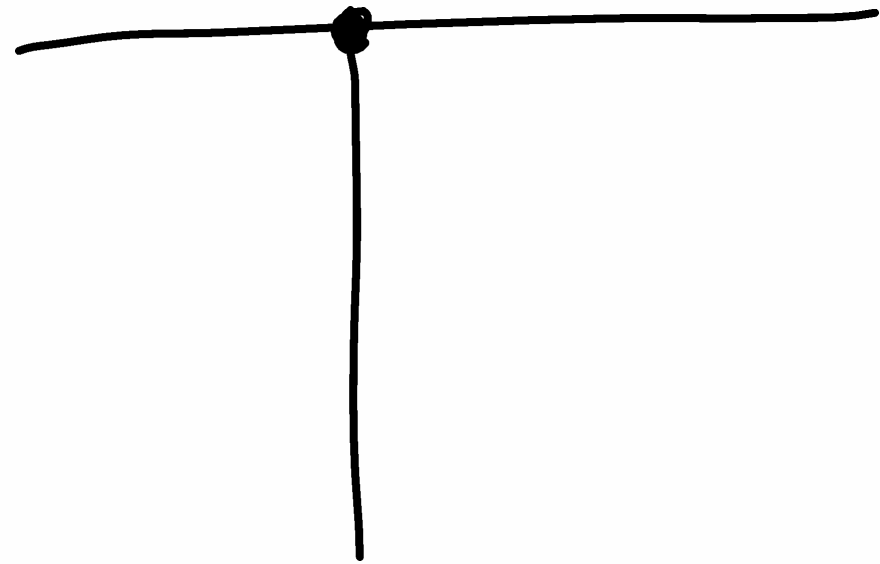
When one line is 1?

$a \wedge b$	=	00
$a \wedge \neg b$	=	01
$\neg a \wedge b$	=	10
$\neg a \wedge \neg b$	=	11

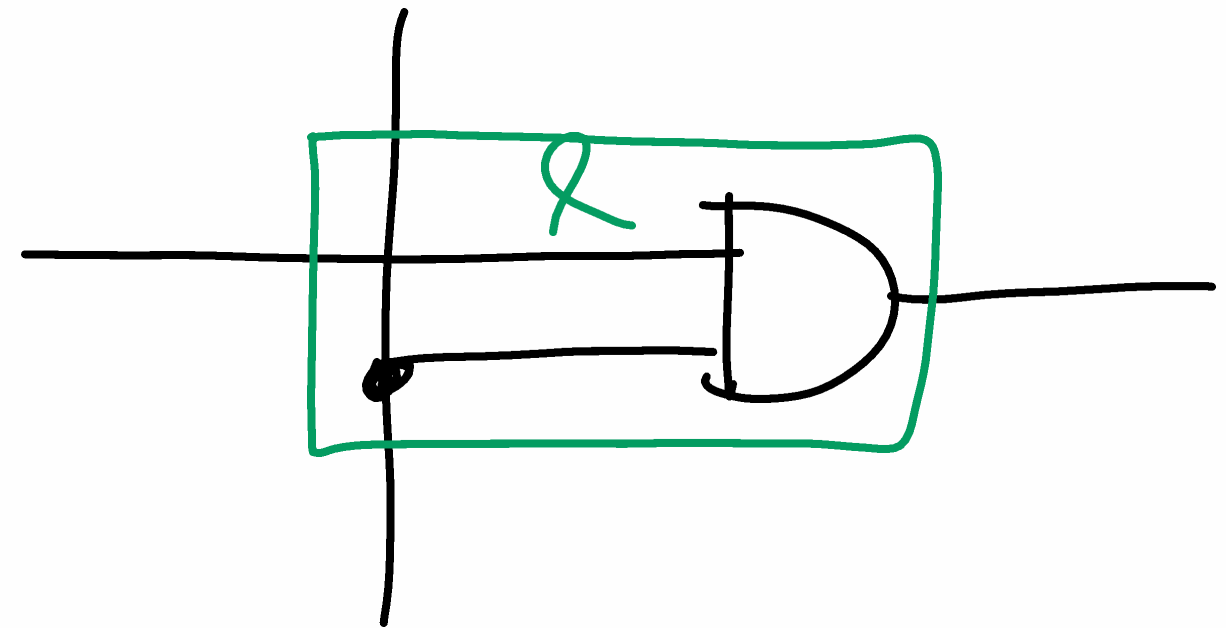
Exercise:
Build a 3-bit Binary Decoder in C



Imagine that we change horizontal lines
side that



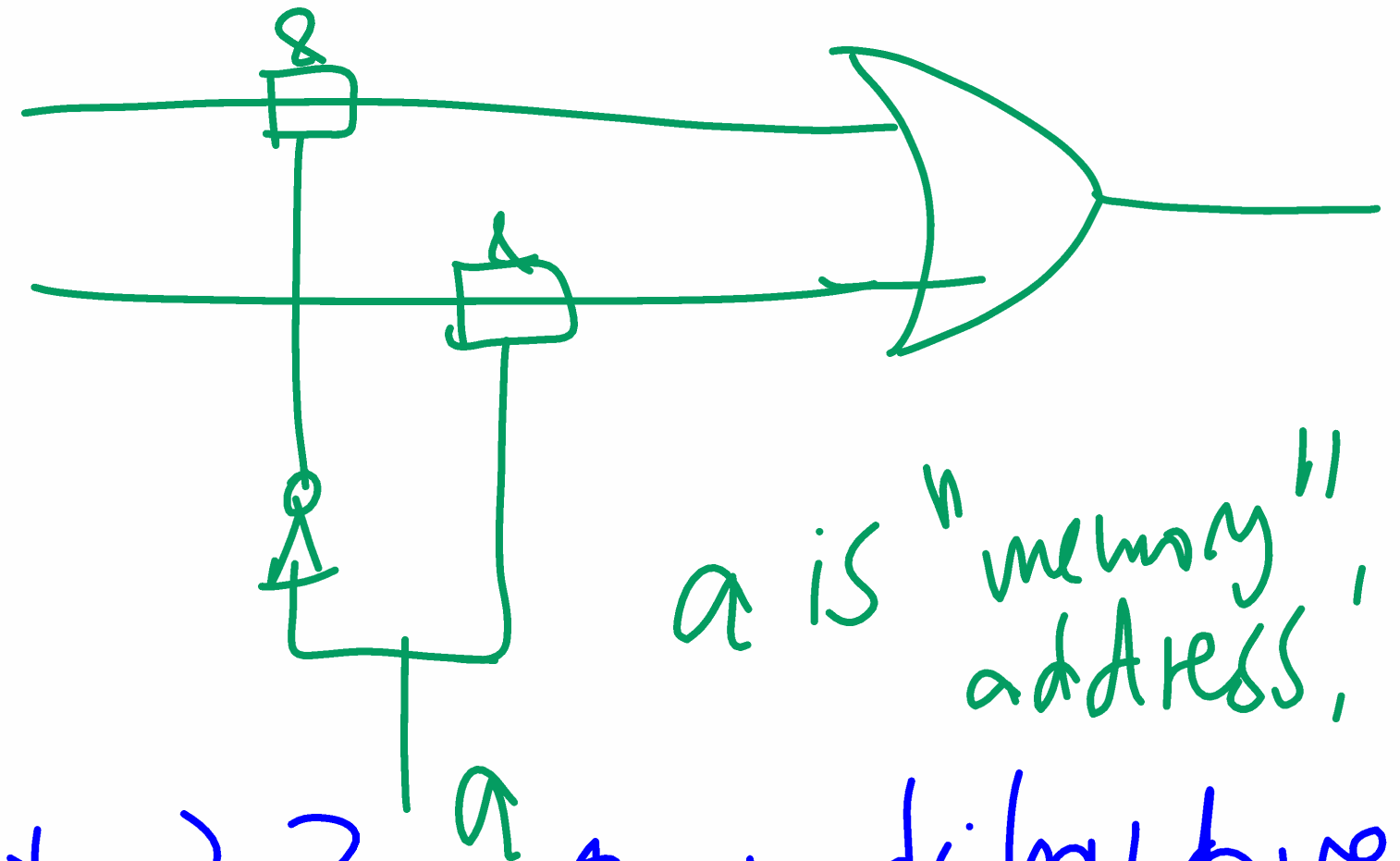
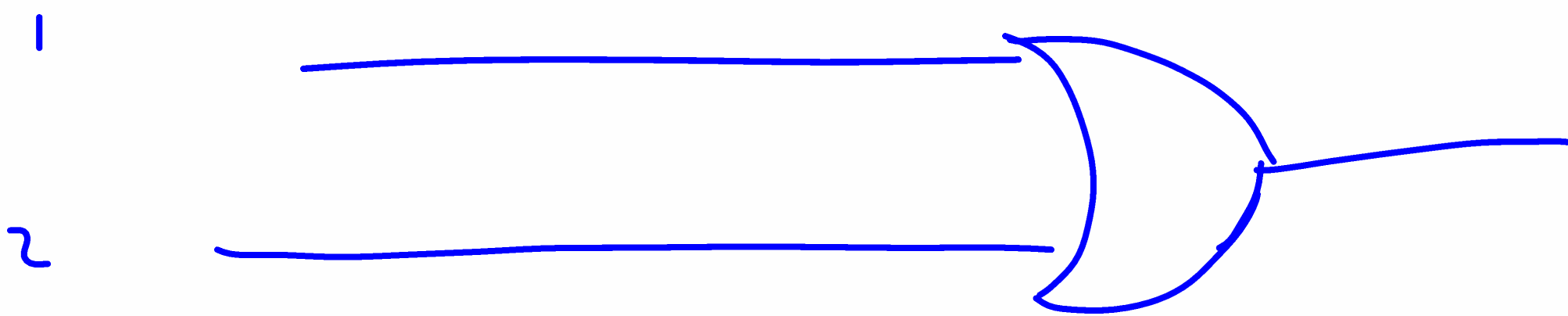
Now means



Addressing: Multiplexer

let's say horizontal lines have only a 2 coming from the "left"

"2-line" Multiplexer
1-bit



a is "memory" address,

How to choose line 1 but not 2? In other words: how do we read each input line?

1 1 1 2 1 1 1

Exercise:

Build a 3-bit Multiplier
in C

a	b	c
0	0	0
0	0	1
0	1	0
0	1	1
1	0	0

