Circuits and Code

CS 2130: Computer Systems and Organization 1

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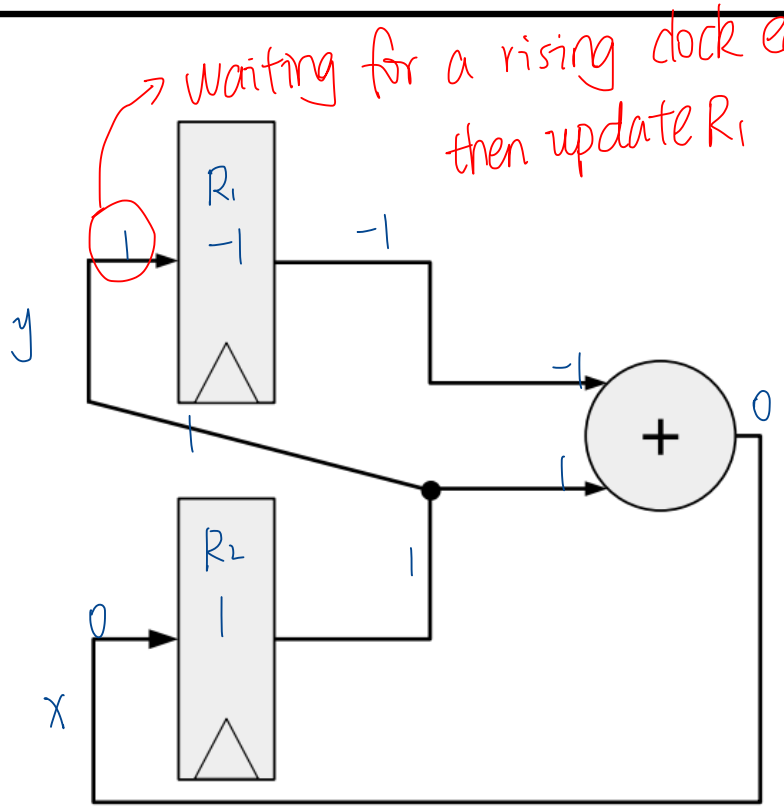
Announcements

- Homework 1 due tonight
- Homework 2 available today, due next Monday

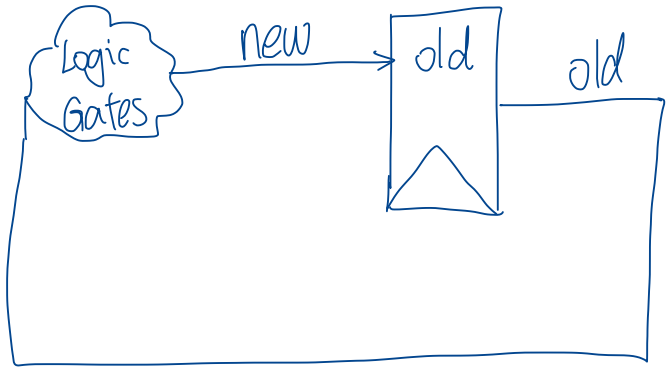
Another Counter



clock	x	y	R_1	R_2
0	0	1	-1	1
1	1	0	1	0
2	1	1	0	1
3	2	1	1	1
4	3	2	1	2
5	5	3		

x : Fibonacci sequence.

Common Model in Computers

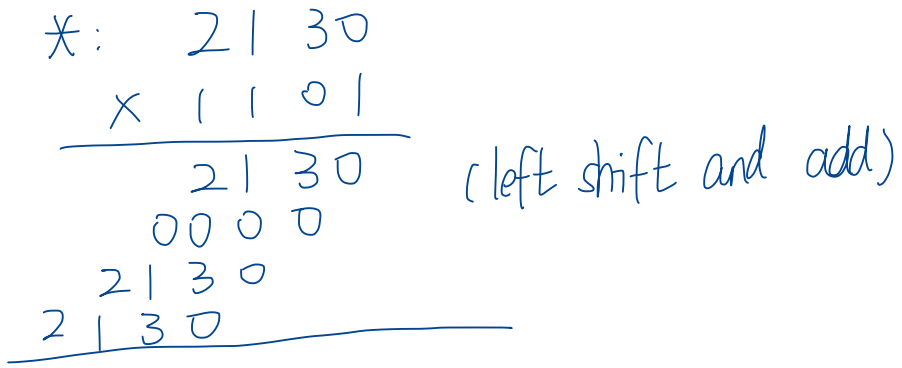


The register ignore all the calculations / updates until rising clock edge.

Code to Build Circuits from Gates

Write code to build circuits from gates

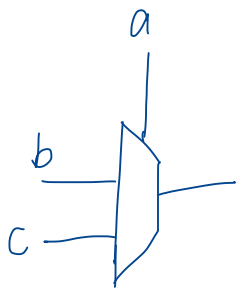
- Gates we already know: &, |, ^, ~
- Operations we can build from gates: +, -
- Others we can build:



Code to Build Circuits from Gates

Write code to build circuits from gates

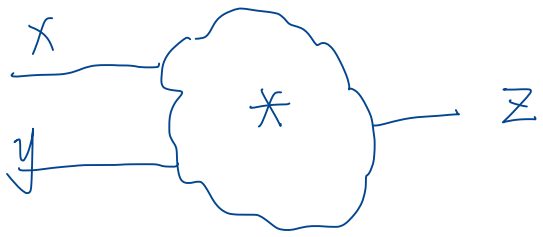
- Gates we already know: &, |, ^, ~
- Operations we can build from gates: +, -
- Others we can build:
- Ternary operator: ? : `a==0?b:c`



Equals

Equals: =

- Attach with a wire (i.e., connect things)
- Ex: z = x * y



attaching the circuit to whatever I'm trying to output

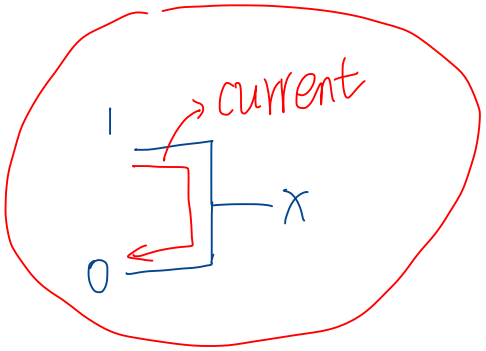
Equals

Equals: =

- Attach with a wire (i.e., connect things)
- Ex: z = x * y
- What about the following?

  x = 1

  x = 0



doesn't work!

Equals

Equals: =

- Attach with a wire (i.e., connect things)
- Ex: z = x * y
- What about the following?

  x = 1

  x = 0
- **Single assignment:** each variable can only be assigned a value once