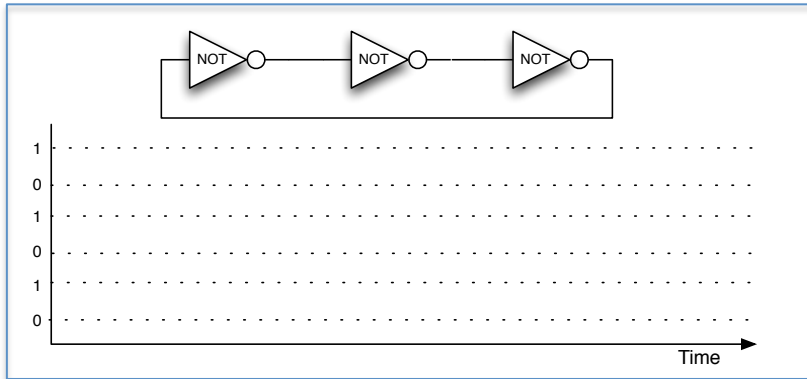
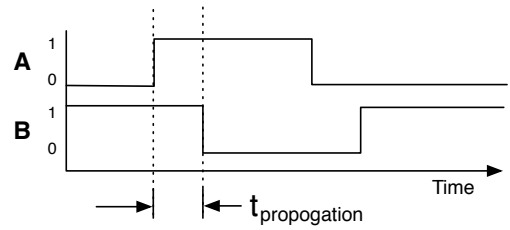
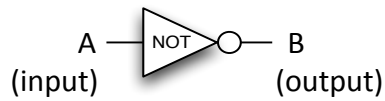
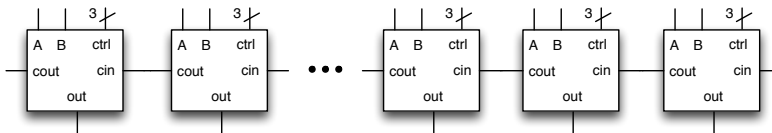


Propagation Delay:



What is likely to be the longest path through this circuit?

- From any data input (A, B) bit to any output bit



How long will it take?

Assume:

Inverter:

20ps delay

2-input gate:

30ps delay

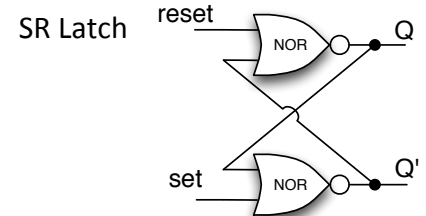
4-input gate:

50ps delay

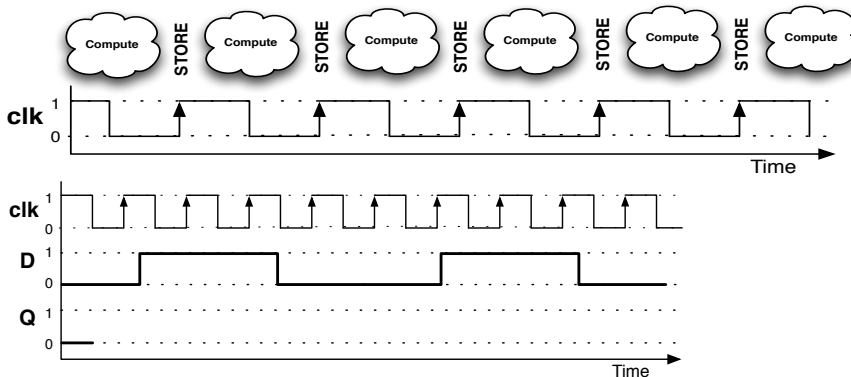
In	Out	Delay
X	S	
Y	S	
Cin	S	
X	Cout	
Y	Cout	
Cin	Cout	

A memory should have at least three properties.

1. It should be able to hold a value.
2. You should be able to *read* the value that was saved.
3. You should be able to *change* the value that's saved.



Synchronous Design:



$$Q_{t=x} =$$

$$Q'_{t=x} =$$

S	R	Q
0	0	No change
0	1	0 (reset)
1	0	1 (set)

Inputs		Current		Next	
S	R	Q	Q'	Q	Q'
0	0	0	1	0	1
0	0	1	0	1	0
0	1	0	1	0	1
0	1	1	0	0	1
1	0	0	1	1	0
1	0	1	0	1	0

The D Flip Flop

Copies D input to Q on rising edge of clock.

