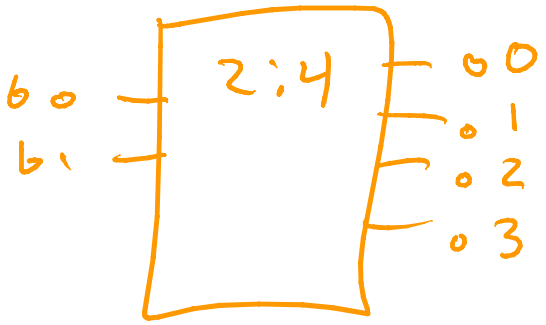
Note Title 5/14/2012

Decoder



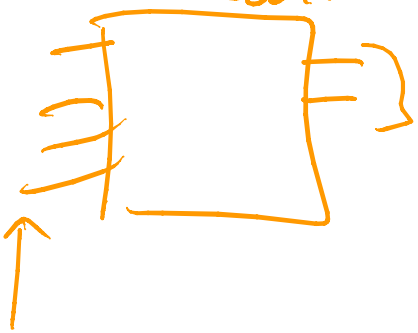
0 1 2 3

00 01 10 11

0001 0010 0100 1000

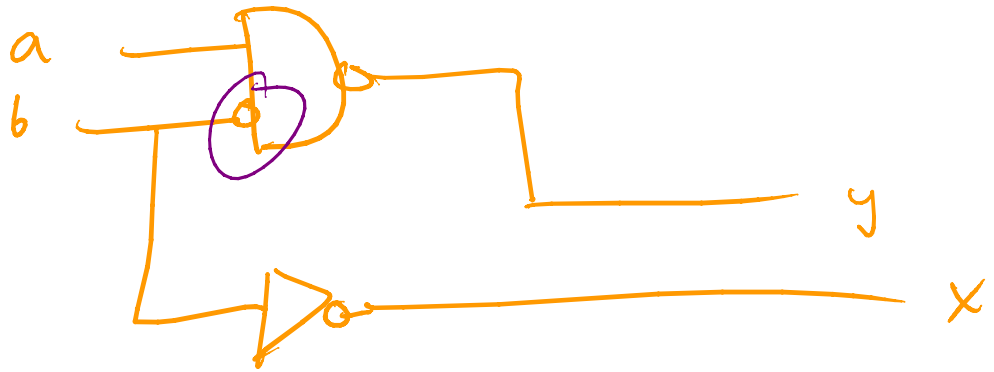
1110 1101 1011 0111

Encoder



Thermo.

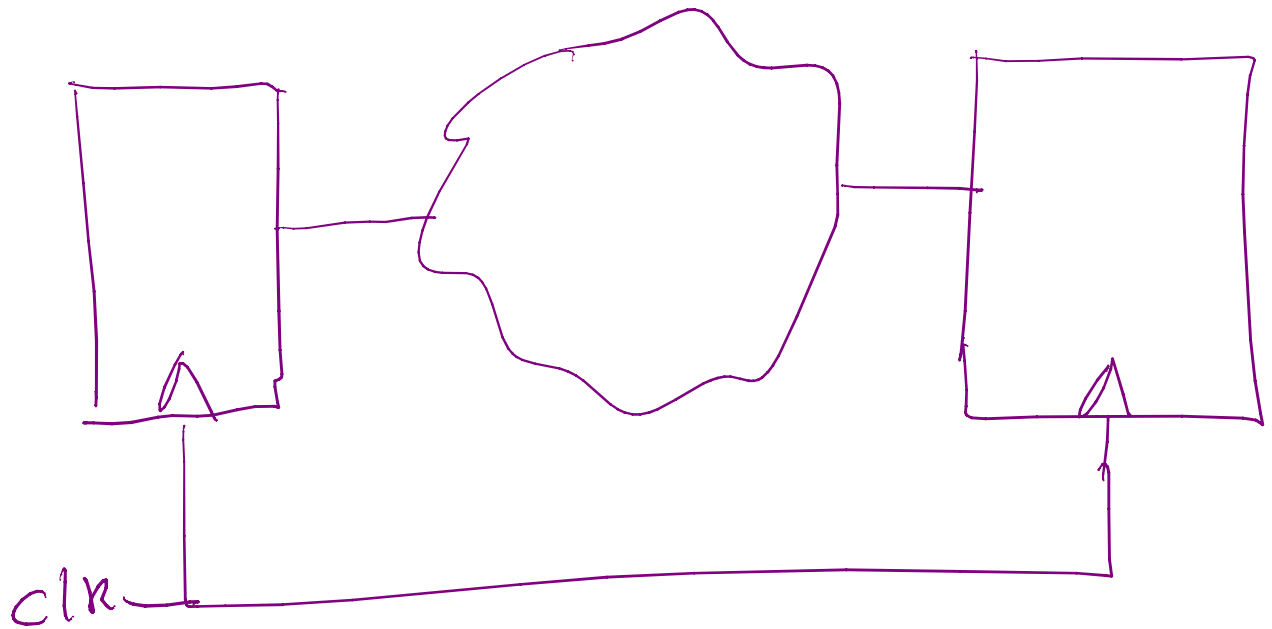
0001 0011 0111 1111



	cd	Pd
NAND	10	20
INV	2	6

Pd	in	out
	b	y

cd	
	b



$f = 1/T$

- Setup time
- t_{pcq} → clock-Q propagation
- t_{pd} → logic propagation

Hold Time Violation

$$(t_{ccq} + t_{cd}) > (t_{hold})$$

2 (over t_{ccq}) + 2 (over t_{cd}) : 1 (over t_{hold})

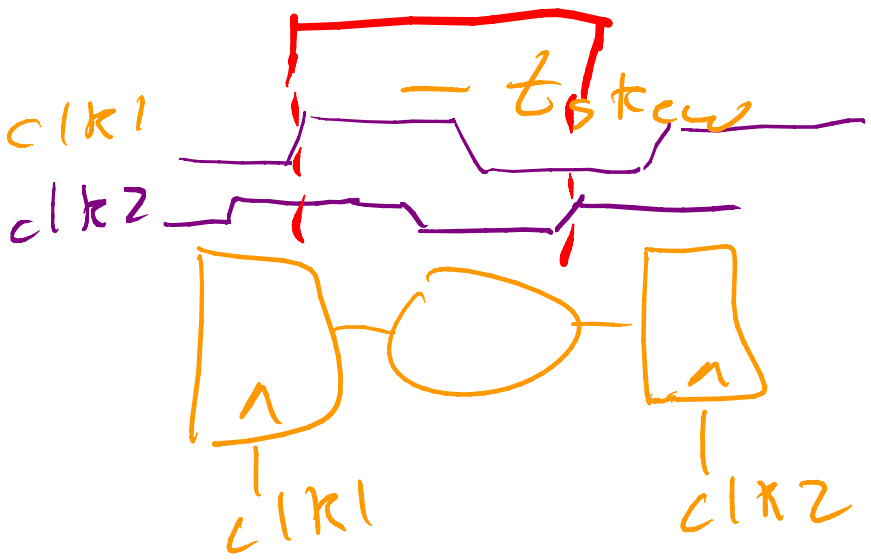
t_{ccq}: clock-Q contamination

t_{cd}: logic contamination

2 must be > 1 for no hold violation

Setup time + Skew

$(t_{pcq} + t_{pd})_2 < (t_{setup})_1$



2 must be < 1 for no violation

{ clk 2 happens before clk 1 }

hold time + skew

$$t_{ccq} + t_{cd} > t_{hold} - t_{skew}$$