

10/19/2009

- HW 7 due Friday at 9 AM 10/23/2009
- Computer Assignment 1 - Wednesday 3 PM 10/28/2009

1011
1010
✓✓✓X

A	B	A = B
0	0	1
0	1	0
1	0	0
1	1	1

1 = YES
0 = NO

XNOR



Magnitude Comparator

$A > B ?$

A: 0110

~~0110~~

B: 0101

$A > B$

$1 > 0 ?$ yes

A is $<$ T B

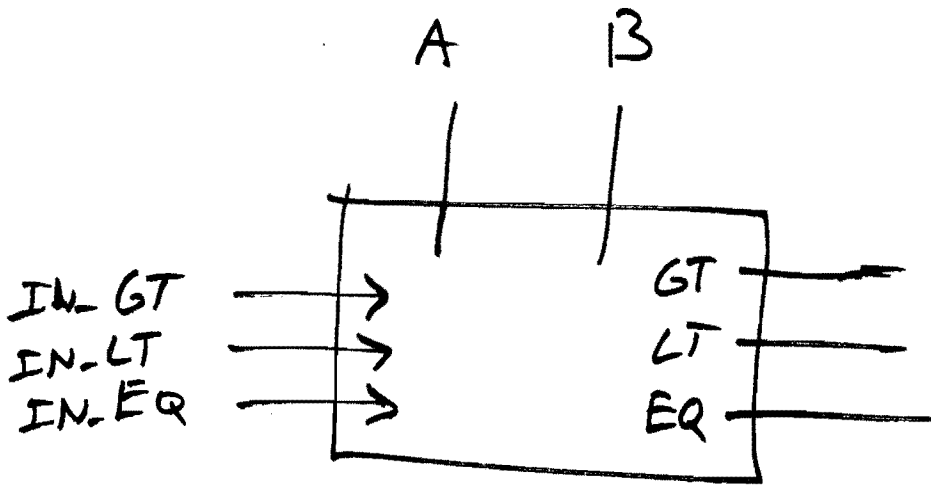
A	B	$A > B$	$A < B$
0	0	0	0
0	1	0	1 ←
1	0	1 ←	0
1	1	0	0

1 = yes

0 = no

$$f_{GT} = A \bar{B}$$

$$f_{LT} = \bar{A} B$$



$$\begin{array}{r} 1001 \\ \underline{0110} \\ \hline 1111 \end{array} \quad \text{GT}$$

$$\begin{array}{r} 1001 \\ \underline{0001} \\ \hline 1000 \end{array} \quad \text{X}$$

If previous value was
GT then the output
should be GT.

$$\begin{array}{l} \text{GT} = 1 \\ \text{and} \\ \text{LT} = 1 \end{array} \quad \text{X}$$

If the previous value was

- A > B
- A < B
- ~~A = B~~

NOT EQUAL
0 · 1 = 1

LT = 1 X = 0
NOT-EQUAL

All Zeros Comparator

1 = A + B are 0s
 0 otherwise

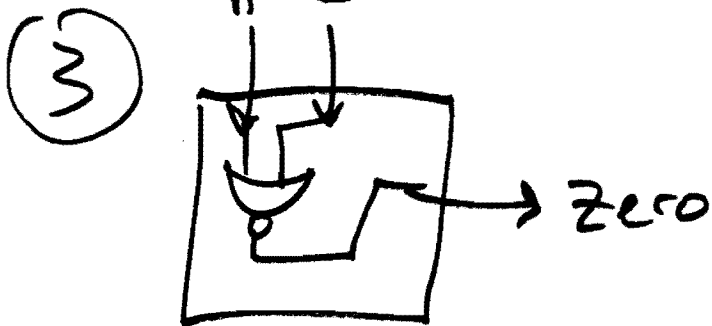
①

A	B	f
0	0	1
0	1	0
1	0	0
1	1	0

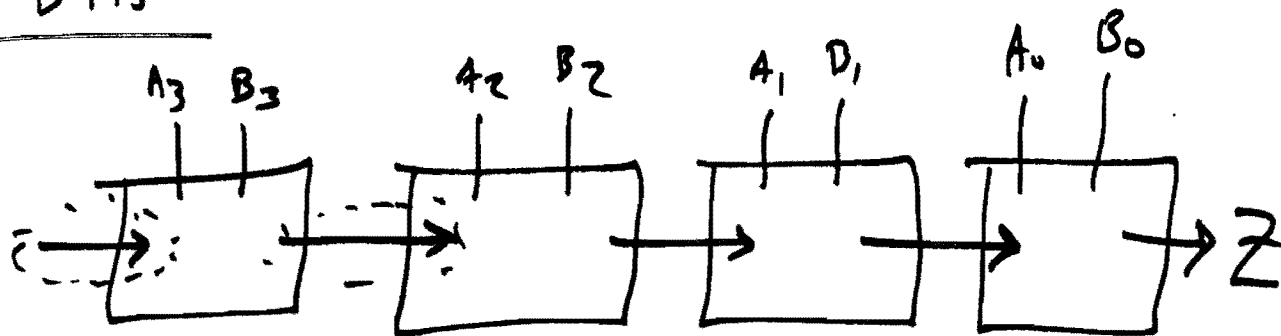
② $f = \bar{A} \bar{B}$

$(A+B)' = \bar{A} \cdot \bar{B}$

NOR Gate



④ 4-Bits



Z_i	A	B	Z_0
0	0	0	0
0	0	1	0
0	1	0	0
0	1	1	0
1	0	0	1
1	0	1	0
1	1	0	0
1	1	1	0

Z_i
 1 = Yes Both Zero
 0 = No Not Zero

$Z_0 = Z_1 \cdot \bar{A} \cdot \bar{B}$