# Digital Design

Lecture 13

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## Magnitude comparato

$A = A_3 A_2 A_1 A_0$

$B = B_3 B_2 B_1 B_0$

case 1 $A = B \Rightarrow \begin{cases} A_0 = B_0 \\ A_1 = B_1 \\ A_2 = B_2 \\ A_3 = B_3 \end{cases}$

Equality of each pair $x_i = A_i B_i + A_i' B_i'$ for $i = 0, 1, 2, 3$

Then for $A = B$

$F = x_3 x_2 x_1 x_0$

$A = B$ $A = 1111$ $B = 1111$ OR $A = 0010$ $B = 0010$

Case 2

$A > B$

2a) $A_3 > B_3$ $A = 1111$ $B = 0111$ OR $A = 1010$ $B = 0111$

$F = A_3 B_3'$

2b) $A_3 = B_3$, $A_2 > B_2$ $A = 1100$ $B = 1000$

$F = A_3 B_3' + A_2 B_2'$

But if $A_3 < B_3$ & $A_2 > B_2$

A 0100

B 1000

$F = 1$ i.e. $A > B$ ✗

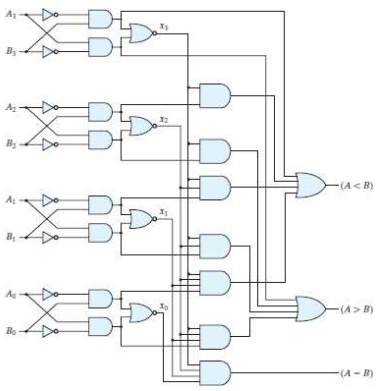
$\therefore F = A_3 B_3' + x_3 A_2 B_2'$ ✓

Similarly, $A = 1110$ $B = 1100$

OR $A = 0010$ $B = 0000$ OR $A = 0010$ $B = 1100$

$A > B = A_3 B_3' + x_3 A_2 B_2' + x_3 x_2 A_1 B_1' + x_3 x_2 x_1 A_0 B_0'$

$A < B = A_3' B_3 + x_3 A_2' B_2 + x_3 x_2 A_1' B_1 + x_3 x_2 x_1 A_0' B_0$




## Tutorial 6