

Magnitude Comparator

29 September 2023

11:50

$$A = A_2 A_1 = \begin{matrix} A_2 & A_1 \\ 1 & 0 \end{matrix}$$

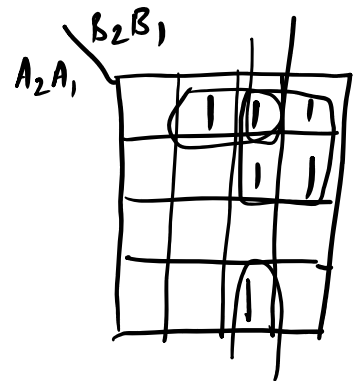
$$B = B_2 B_1 = \begin{matrix} B_2 & B_1 \\ 1 & 1 \end{matrix}$$

$$\begin{matrix} A_2 & A_1 & B_2 & B_1 \\ 1 & 0 & 1 & 1 \end{matrix}$$

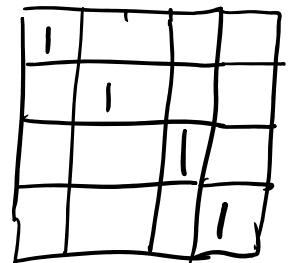
I/P

$A_2 A_1$	$B_2 B_1$	$A < B$	$A = B$	$A > B$
0 0	0 0	0	1	0
0 0	0 1	1	0	0
0 0	1 0	1	0	0
0 0	1 1	1	0	0
0 1	0 0	0	0	1
0 1	0 1	0	1	0
0 1	1 0	1	0	0
0 1	1 1	1	0	0
1 0	0 0	0	0	1
1 0	0 1	0	0	1
1 0	1 0	0	1	0
1 0	1 1	1	0	0
1 1	0 0	0	0	1
1 1	0 1	0	0	1
1 1	1 0	0	0	1
1 1	1 1	0	1	0

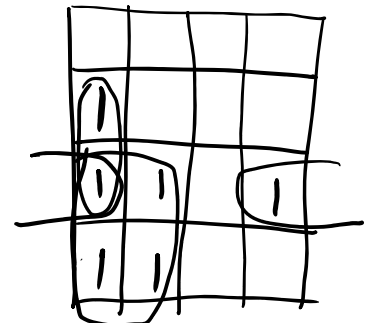
$A < B$



$A = B$



$A > B$



1

$$(A < B) = \bar{A}_2 \bar{A}_1 B_1 + \bar{A}_2 B_1 + \bar{A}_1 B_2 B_1$$

$$(A = B) = (A_2 \odot B_2) (A_1 \odot B_1)$$

$$(A > B) = A_1 \bar{B}_2 B_1 + A_2 A_1 \bar{B}_1 + A_2 \bar{B}_2$$