Inputs				outputs		
A_1	A_0	B_1	B_0	$A<B$	$A=B$	$A>B$
0	0	0	0	0	1	0
0	0	0	1	1	0	0
0	0	1	0	1	0	0
0	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	1	0	0	0	0	1
1	1	1	0	0	0	1
1	1	0	1	0	0	1
1	1	1	1	0	1	0
0	0	1	1	1	0	0
1	0	1	1	1	0	0

⇒ $A > B$:-

A_1A_0 \ B_1B_0	00	01	11	10
00	0	0	0	0
01	1	0	0	0
11	1	1	0	1
10	1	1	0	0

$A > B$: $A_1\bar{B}_1 + A_0\bar{B}_1\bar{B}_0 + A_1A_0\bar{B}_0$

$= A_1\bar{B}_1 + A_0\bar{B}_0(\bar{B}_1 + A_1)$

⇒ $A = B$:

A_1A_0 \ B_1B_0	00	01	11	10
00	1	0	0	0
01	0	1	0	0
11	0	0	1	0
10	0	0	0	1

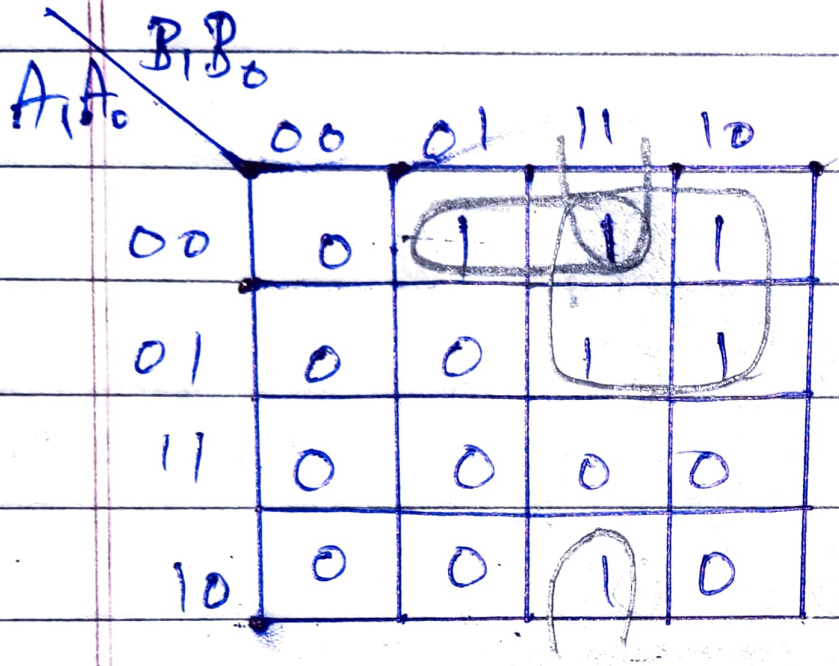
$A = B$: $\bar{A}_1\bar{A}_0\bar{B}_1\bar{B}_0 + \bar{A}_1A_0\bar{B}_1B_0 + A_1A_0B_1B_0 + A_1\bar{A}_0B_1\bar{B}_0$

$= \bar{A}_1\bar{B}_1(\bar{A}_0\bar{B}_0 + A_0B_0) + A_1B_1(A_0B_0 + \bar{A}_0\bar{B}_0)$

$= (A_0B_0 + \bar{A}_0\bar{B}_0)(A_1B_1 + \bar{A}_1\bar{B}_1)$

$= (A_0 \text{ XNOR } B_0)(A_1 \text{ XNOR } B_1)$

$\Rightarrow A < B$:-



$A < B$: $\bar{A}_1 B_1 + \bar{A}_0 B_1 B_0 + \bar{A}_1 \bar{A}_0 B_0$

$= \bar{A}_1 B_1 + \bar{A}_0 B_0 (B_1 + \bar{A}_1)$