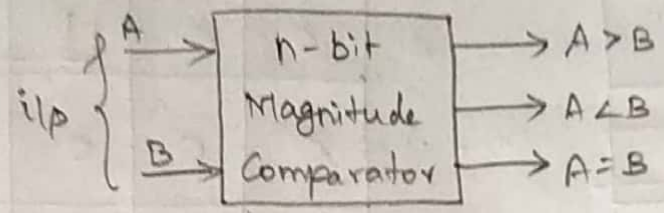
MAGNITUDE COMPARATOR.

2-BIT MAGNITUDE COMPARATOR.



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

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<B

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

$A<B = \bar{A}_1B_1 + \bar{A}_1\bar{A}_0B_0 + \bar{A}_0B_1B_0$

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

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

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

$= \bar{A}_1\bar{B}_1(A_0 \odot B_0) + A_1B_1(A_0 \odot B_0)$

$= (A_0 \odot B_0)(\bar{A}_1\bar{B}_1 + A_1B_1)$

$= (A_0 \odot B_0)(A_1 \odot B_1)$

Logic Diagram.