Lab Report No 9

Digital Logic Design

Submitted By:

Abdul Ahad

22-CS-071

Muhammad Afzal

22-CS-035

Muhammad Zain Ali

22-CS-015

Faisal Khan

22-CS-039

Bilal Asghar

22-CS-107

Submitted to:

Engr. Bushra Fiaz

Dated:

Week 09

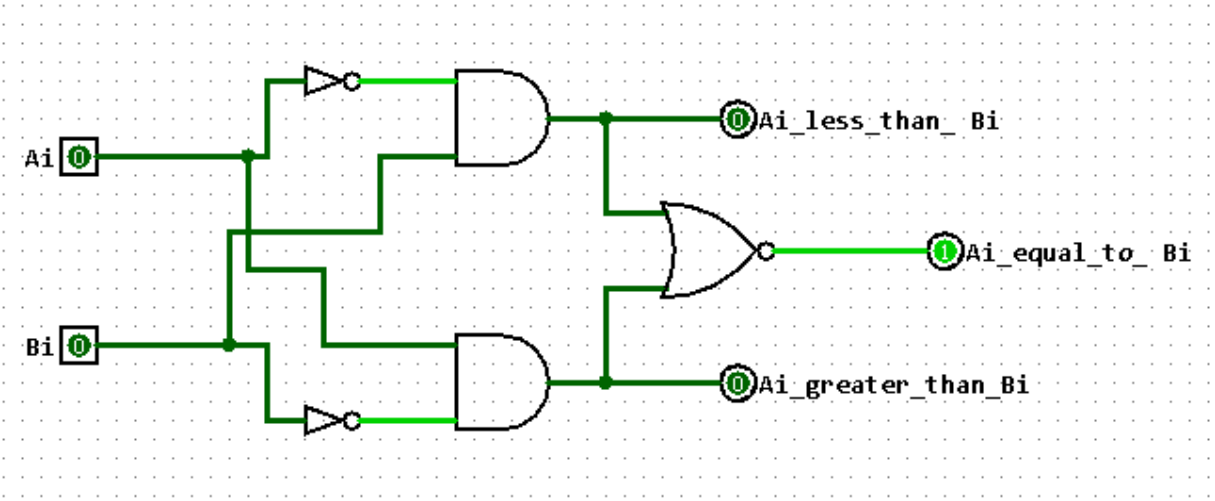
Department of Computer Science,

HITEC University, Taxila

Task 1:

Solution:

Question
Implement and verify the 1-Bit Magnitude Comparator Boolean expressions by using basic logic gates on trainer board
Brief Description
The 1-bit magnitude comparator compares two binary numbers, A and B, and determines if A is greater than B, equal to B, or less than B. The output of the comparator is a set of three control signals: A>B (A is greater than B), A=B (A is equal to B), and A<B (A is less than B).
The results (Screenshot)

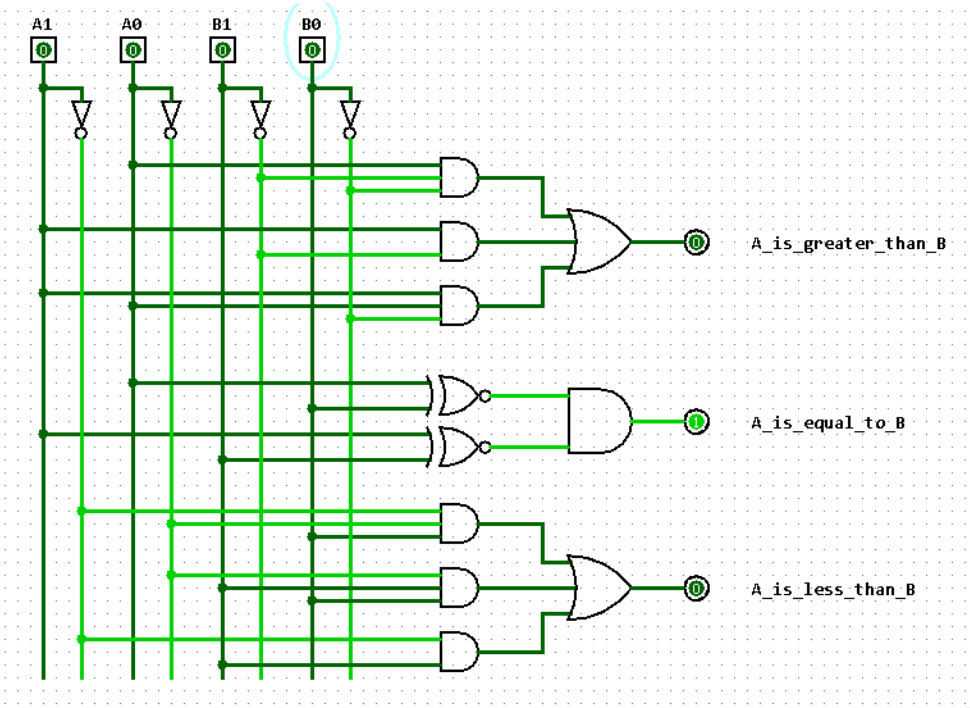


Ai	Bi	Ai_less_than_Bi	Ai_equal_to_Bi	Ai_greater_than_Bi
0	0	0	1	0
0	1	1	0	0
1	0	0	0	1
1	1	0	1	0

Task 2:

Solution:

Question
Implement and verify the 2-Bit Magnitude Comparator Boolean expressions by using basic logic gates and simulate the circuit with Logisim.
Brief Description
A 2-bit magnitude comparator is a digital circuit that compares two 2-bit binary numbers and determines their relative magnitudes. It determines whether one number is greater than, equal to, or less than the other number. The comparator has two 2-bit inputs, A [1:0] and B [1:0], representing the two binary numbers to be compared. It produces three output signals: A>B, A=B, and A<B, indicating the results of the comparison.
The results (Screenshot)



A1	A0	B1	B0	A_is_greater_than_B	A_is_equal_to_B	A_is_less_than_B
0	0	0	0	0	1	0
0	0	0	1	0	0	1
0	0	1	0	0	0	1
0	0	1	1	0	0	1
0	1	0	0	1	0	0
0	1	0	1	0	1	0
0	1	1	0	0	0	1
0	1	1	1	0	0	1
1	0	0	0	1	0	0
1	0	0	1	1	0	0
1	0	1	0	0	1	0
1	0	1	1	0	0	1
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	1	0