

## Analysis and Synthesis of Boolean Relations using Digital Comparator of two binary numbers

### INSTRUCTION

1. Apply high to  $V_{CC}$  and low voltage to ground(GND)
2. For all the combinations of the 4 bit inputs A ( $A_3 A_2 A_1 A_0$ ), B ( $B_3 B_2 B_1 B_0$ ) verify that the LEDs are ON or not.
3. Enter binary input A=0110 (Decimal value is 6), B=0110 (Decimal value is 6). Output A=B, the led will be on.
4. Enter binary input A=1010 (Decimal value is 10), B=0010 (Decimal value is 2). Output A>B, the led will be on.
5. Enter binary input A=0010 (Decimal value is 2), B=1010 (Decimal value is 10). Output A<B, the led will be on.
6. Enter other input combination of A and B
7. Note: Red button symbolize as Low (L), Green button symbolize as High(H).

### TRUTH TABLE

A				B				Output		
$A_3$	$A_2$	$A_1$	$A_0$	$B_3$	$B_2$	$B_1$	$B_0$	$A > B$	$A < B$	$A = B$
0	0	0	0	0	0	0	0	0	0	1
0	0	0	1	0	0	0	0	1	0	0
0	0	0	0	0	0	0	1	0	0	1
0	0	0	0	0	0	1	0	0	1	0
0	0	1	0	0	0	1	0	0	0	1
0	0	1	1	0	0	1	0	1	0	0
0	1	1	1	0	1	1	0	1	0	0
1	0	0	0	0	1	0	0	1	0	0
1	0	0	0	0	1	0	0	1	0	0
0	0	1	1	0	1	1	0	0	1	0
0	0	1	0	0	1	1	0	0	1	0

VCC and GND are properly connected

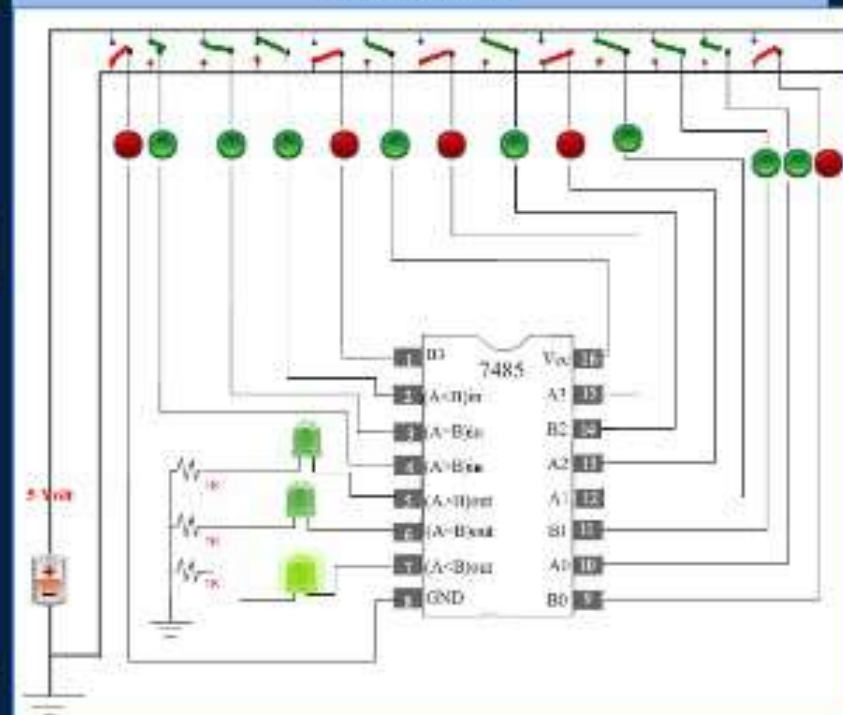
Add to table

$A_3 A_2 A_1 A_0$   $B_3 B_2 B_1 B_0$

0010

0110

### CIRCUIT DIAGRAM



TRUTH TABLE

A								B								Output		
A <sub>7</sub>	A <sub>6</sub>	A <sub>5</sub>	A <sub>4</sub>	A <sub>3</sub>	A <sub>2</sub>	A <sub>1</sub>	A <sub>0</sub>	B <sub>7</sub>	B <sub>6</sub>	B <sub>5</sub>	B <sub>4</sub>	B <sub>3</sub>	B <sub>2</sub>	B <sub>1</sub>	B <sub>0</sub>	A > B	A < B	A = B
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	
0	0	1	0	0	0	0	1	0	0	0	1	0	0	1	0	0	1	
0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	
1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	0	0	1
1	1	1	1	1	1	1	0	1	1	1	1	1	1	1	1	0	1	0
1	1	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	0	0
1	0	1	1	1	1	1	0	1	1	1	1	0	1	1	1	0	1	0

VCC and GND are properly connected

A<sub>7</sub>A<sub>6</sub>A<sub>5</sub>A<sub>4</sub>A<sub>3</sub>A<sub>2</sub>A<sub>1</sub>A<sub>0</sub> 10111110

B<sub>7</sub>B<sub>6</sub>B<sub>5</sub>B<sub>4</sub>B<sub>3</sub>B<sub>2</sub>B<sub>1</sub>B<sub>0</sub> 11110111

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CIRCUIT DIAGRAM

