**4. Design 4-bit Magnitude Comparator**

* As 4-bit magnitude comparator is required. I’ve drawn a truth table to check each bit starting from MSB
* If MSB is greater, there is no need to check other bits
* Else if MSB’s are same, we go to following bits and use same method.
* After truth table, we can find the equations for A>B, A=B, A<B.
* Hence, a 4-bit magnitude comparator works.

In the code if

a>b then greater = 1

a<b then less = 1

a=b then equal = 1

**STIMULUS**

**INPUT:** a =7 | b=7

**EXPECTED OUTPUT:** less = 0 | equal = 1 | greater = 0

**SIMULATION OUTPUT:** less = 0 | equal = 1 | greater = 0

**INPUT:** a = 2 | b= 2

**EXPECTED OUTPUT:** less = 0 | equal = 1 | greater = 0

**SIMULATION OUTPUT:** less = 0 | equal = 1 | greater = 0

**INPUT:** a =0 | b= 0

**EXPECTED OUTPUT:** less = 0 | equal = 1 | greater = 0

**SIMULATION OUTPUT:** less = 0 | equal = 1 | greater = 0

**INPUT:** a = 1| b= 3

**EXPECTED OUTPUT:** less = 1 | equal = 0 | greater = 0

**SIMULATION OUTPUT:** less = 1 | equal = 0 | greater = 0

**INPUT:** a = 7| b= 5

**EXPECTED OUTPUT:** less = 0 | equal = 0 | greater = 1

**SIMULATION OUTPUT:** less = 0 | equal = 0 | greater = 1

**INPUT:** a =10 | b= 2

**EXPECTED OUTPUT:** less = 0 | equal = 0 | greater = 1

**SIMULATION OUTPUT:** less = 0 | equal = 0 | greater = 1

**INPUT:** a = 14| b= 9

**EXPECTED OUTPUT:** less = 0 | equal = 0 | greater = 1

**SIMULATION OUTPUT:** less = 0 | equal = 0 | greater = 1

**INPUT:** a = 15| b= 15

**EXPECTED OUTPUT:** less = 0 | equal = 1 | greater = 0

**SIMULATION OUTPUT:** less = 0 | equal = 1 | greater = 0

**INPUT:** a = 4| b= 15

**EXPECTED OUTPUT:** less = 1 | equal = 0 | greater = 0

**SIMULATION OUTPUT:** less = 1 | equal = 0 | greater = 0

**INPUT:** a =8 | b= 5

**EXPECTED OUTPUT:** less = 0 | equal = 0 | greater = 1

**SIMULATION OUTPUT:** less = 0 | equal = 0 | greater = 1

All outputs are correct!