1.

module FourBitMagComp(input[3:0] a, input[3:0] b, output eq, output lt, output gt);

assign eq = a == b;

assign lt = a < b;

assign gt = a > b;

endmodule

module EightBitMagComp(input[7:0] a, input[7:0] b, output eq, output lt, output gt);

wire tempEQ1, tempLT1, tempGT1;

wire tempEQ2, tempLT2, tempGT2;

FourBitMagComp first4BitMagComp(a[7:4], b[7:4], tempEQ1, tempLT1, tempGT1);

FourBitMagComp second4BitMagComp(a[3:0], b[3:0], tempEQ2, tempLT2, tempGT2);

assign eq = tempEQ1 & tempEQ2;

assign gt = tempGT1 | (tempEQ1 & tempGT2);

assign lt = ~eq & ~gt;

endmodule

module EightBitMagComp\_tb;

reg[7:0] a, b;

wire eq, lt, gt;

EightBitMagComp eightBitMagComp(a, b, eq, lt, gt);

initial begin

$monitor("%d a=%d, b=%d -> eq=%b, lt=%b, gt=%b", $time, a, b, eq, lt, gt);

#10 a=8'd10;

b=8'd9;

#10 a=8'd66;

b=8'd107;

#10 a=8'd49;

b=8'd49;

#10 $finish;

end

endmodule

2.

