Structural Modeling CheatSheet (3-Bit Comparator)


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//- defintion of XNOR gate
module my_xnor(A, B, F);
    input  A,B;
    output F;

    assign F = ~(A ^ B);
endmodule

//- definition of 3-input AND gate
module my_and(A, B, C, F);
    input  A, B, C;
    output F;

    assign F = A & B & C;
endmodule

//- definition of 3-bit comparator
module comp_3b(A,B,EQ);
    //- external interface signals
    input [2:0] A,B;
    output EQ;

    //- internal interface signals
    wire [2:0] m;


    //- XNOR instantiations
    my_xnor XNOR2 (
      .A (A[2]),
      .B (B[2]),
      .F (m[2])    );

    //- XNOR instantiation
    my_xnor XNOR1 (
      .A (A[1]),
      .B (B[1]),
      .F (m[1])    );

    //- XNOR instantiation
   my_xnor XNOR0 (
      .A (A[0]),
      .B (B[0]),
      .F (m[0])   );

    //- AND instantiation
   my_and  AND0 (
      .A (m[2]),
      .B (m[1]),
      .C (m[0]),
      .F (EQ)   );

endmodule
```