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/*****
* Date: Aug. 28, 1999
* File: Decoder 2 to 4.v    (440 Examples)
*
* Module of a 2 to 4 Decoder with an active high enable input and
* and active low outputs. This model uses behavioral modeling via
* via the "case" statement.
*****/

//*****
module decoder_2to4(Y3, Y2, Y1, Y0, A, B, en);
//*****

    output Y3, Y2, Y1, Y0;
    input  A, B;
    input  en;
    reg    Y3, Y2, Y1, Y0;

    always @(A or B or en) begin
        if (en == 1'b1)
            case ( {A,B} )
                2'b00: {Y3,Y2,Y1,Y0} = 4'b1110;
                2'b01: {Y3,Y2,Y1,Y0} = 4'b1101;
                2'b10: {Y3,Y2,Y1,Y0} = 4'b1011;
                2'b11: {Y3,Y2,Y1,Y0} = 4'b0111;
                default: {Y3,Y2,Y1,Y0} = 4'bxxxx;
            endcase
        if (en == 0)
            {Y3,Y2,Y1,Y0} = 4'b1111;
        end
    end

endmodule

```