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/* half subtractor in behavioral model */

module halfSub(input X, Y, output reg D,B);
    always @(X or Y) begin
        if (X == 1'b0 && Y == 1'b1)
            begin
                D = 1'b1;
                B = 1'b1;
            end
        else if (X == 1'b1 && Y == 1'b0)
            begin
                D = 1'b1;
                B = 1'b0;
            end
        else if (X == 1'b1 && Y == 1'b1)
            begin
                D = 1'b0;
                B = 1'b0;
            end
        else
            begin
                D = 1'b0;
                B = 1'b0;
            end
        end
    end
endmodule

/* testbench module */

module HS_tb;
    reg m, n;
    wire d, b;
    halfSub hs(m, n, d, b);
    initial begin
        m = 0; n = 0;
        #1 m = 0; n = 1;
        #1 m = 1; n = 0;
        #1 m = 1; n = 1;
    end
    initial begin
        $monitor("%t | A = %d | B = %d | Difference = %d | Borrow = %d |", $time,
m, n, d, b);
    end
endmodule
```