//testbench

module fbaddertb;

reg [3:0] a,b;

reg c;

wire [3:0] s;

wire cout;

fbadder4 uut( .a(a), .b(b), .c(c), .s(s), .cout(cout));

initial begin

$dumpfile("fbadder4.vcd");

$dumpvars(1);

end

initial begin

a = 4'b0001; b = 4'b0000; c = 1'b0;

#50;

a = 4'b0011; b = 4'b0001; c = 1'b0;

#50;

a = 4'b0000; b = 4'b1000; c = 1'b1;

#50;

a = 4'b0000; b = 4'b1111; c = 1'b1;

#50;

$finish;

end

endmodule

//design

module fbadder4(a, b, c, s, cout);

input [3:0] a,b;

input c;

output [3:0] s;

output cout;

assign s = a ^ b ^ c;

assign cout = a&b | a&c | b&c;

endmodule