module par\_sub(a,b,cin,diff,bout);

input [7:0] a;

input [7:0] b;

input cin;

output reg [7:0] diff;

output reg bout;

reg [8:0] c;

integer i;

always @ (a or b or cin)

begin

c[0]=cin;

if (cin == 0) begin

for ( i=0; i<8 ; i=i+1)

begin

diff[i]= a[i]^b[i]^c[i];

c[i+1]= (a[i]&b[i])|(a[i]&c[i])|(b[i]&c[i]);

end

end

else if (cin == 1) begin

for ( i=0; i<8 ; i=i+1)

begin

diff[i]= a[i]^(~ b[i])^c[i];

c[i+1]= (a[i]&(~b[i]))|(a[i]&c[i])|((~b[i])&c[i]);

end

end

bout=c[8];

end

endmodule