```
// Half Adder
// Sum = a XOR b, Cout = a AND b



module HA(a, b, Sum, Cout);

input a, b; // a and b are inputs with size 1-bit
output Sum, Cout; // Sum and Cout are outputs with size 1-bit

assign Sum = a ^ b;
assign Cout = a & b;

endmodule




//carry save adder

module csa_dadda(A,B,Cin,Y,Cout);
input A,B,Cin;
output Y,Cout;

assign Y = A^B^Cin;
assign Cout = (A&B)|(A&Cin)|(B&Cin);

endmodule
```