

Data Flow Modelling

```
module full_adder(
    input A,B,Cin,
    output Sum,Cout
);
    assign Sum = (A^B^Cin);
    assign Cout = (A&B)|(A&Cin)|(B&Cin);
endmodule
```

Test Bench

```
module full_adder_tb;
    reg A,B,Cin;
    wire Sum, Cout;

    // Instantiate uut
    full_adder uut(
        .A(A),
        .B(B),
        .Cin(Cin),
        .Sum(Sum),
        .Cout(Cout)
    );

    initial begin
        $display ("A B Cin | Sum Cout");
        A=0;B=0;Cin=0;#10;
```

```
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=0;B=0;Cin=1;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=0;B=1;Cin=0;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=0;B=1;Cin=1;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=1;B=0;Cin=0;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=1;B=0;Cin=1;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=1;B=1;Cin=0;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

A=1;B=1;Cin=1;#10;
$display("%b %b %b | %b %b",A,B,Cin,Sum,Cout);

$finish;
end
endmodule
```