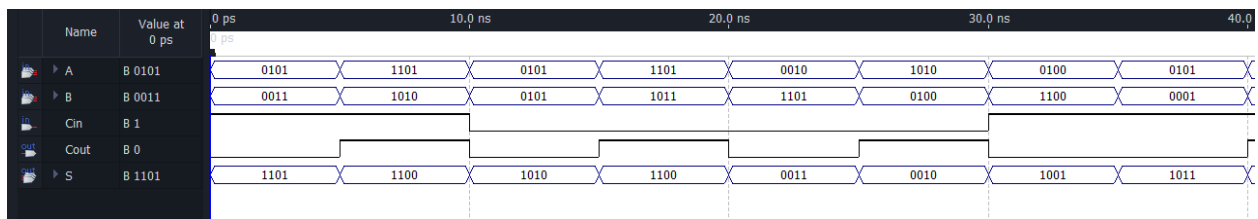Mô hình cấu trúc

```verilog
module full_adder (input A, B, Cin, output S, Cout);
wire w0, w1, w2;
xor(w0, A, B);
and(w1, A, B);
xor(S, w0, Cin);
and(w2, w0, Cin);
or(Cout, w1, w2);
endmodule
```

```verilog
module full_adder_4bit_0(A, B, Cin, S, Cout);
input [3:0] A, B;
input Cin;
output [3:0] S;
output Cout;
wire w0, w1, w2;

full_adder (A[0], B[0], Cin, S[0], w0);
full_adder (A[1], B[1], w0, S[1], w1);
full_adder (A[2], A[2], w1, S[2], w2);
full_adder (A[3], A[3], w2, S[3], Cout);

endmodule
```

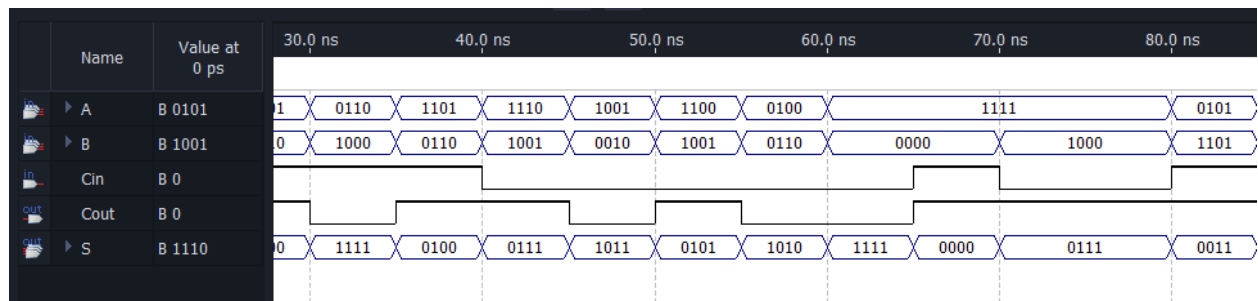| Name | Value at 0 ps | | | | | | | | |
|------|---------------|---|---|---|---|---|---|---|---|
| A | B 0101 | 0101 | 1101 | 0101 | 1101 | 0010 | 1010 | 0100 | 0101 |
| B | B 0011 | 0011 | 1010 | 0101 | 1011 | 1101 | 0100 | 1100 | 0001 |
| Cin | B 1 | | | | | | | | |
| Cout | B 0 | | | | | | | | |
| S | B 1101 | 1101 | 1100 | 1010 | 1100 | 0011 | 0010 | 1001 | 1011 |

Mô hình hành vi gán liên tục

```
1    module full_adder_4bit_1 (A, B, Cin, S, Cout);
2    input [3:0] A, B;
3    input Cin;
4    output [3:0] S;
5    output Cout;
6
7    assign {Cout, S} = A + B + Cin;
8    endmodule
```

| Name | Value at 0 ps | 30.0 ns | | 40.0 ns | | 50.0 ns | | 60.0 ns | | 70.0 ns | | 80.0 ns |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B 0101 | 01 | 0110 | 1101 | 1110 | 1001 | 1100 | 0100 | | 1111 | | 0101 |
| B | B 1001 | 0 | 1000 | 0110 | 1001 | 0010 | 1001 | 0110 | 0000 | | 1000 | 1101 |
| Cin | B 0 | | | | | | | | | | | |
| Cout | B 0 | | | | | | | | | | | |
| S | B 1110 | 0 | 1111 | 0100 | 0111 | 1011 | 0101 | 1010 | 1111 | 0000 | 0111 | 0011 |

Mô hình hành vi gán quy trình

```
1     module full_adder_4bit_2(A, B, Cin, S, Cout);
2     input [3:0] A, B;
3     input Cin;
4     output reg [3:0] S;
5     output reg Cout;
6
7     always @(*)
8         begin
9             {Cout, S} <= A + B + Cin;
10        end
11    endmodule
```

| Name | Value at 0 ps | 0 ps | | 10.0 ns | | 20.0 ns | | 30.0 ns | | 40.0 ns | | 50.0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | B 0000 | 0000 | 1001 | 1010 | 1101 | 1011 | 1110 | 0101 | 0010 | 1101 | 0001 | |
| B | B 1110 | 1110 | | 0110 | 1101 | 0010 | 1100 | 0111 | 1111 | 0011 | 0000 | |
| Cin | B 1 | | | | | | | | | | | |
| Cout | B 0 | | | | | | | | | | | |
| S | B 1111 | 1111 | 1000 | 0000 | 1010 | 1110 | 1010 | 1101 | 0001 | | 0010 | |