

```
module ALU (A,B,OUT,control);
```

```
input [1:0] A,B;
```

```
input [2:0] control;
```

```
output [3:0] OUT;
```

```
reg [1:0] INI;
```

```
reg [3:0] hold;
```

```
integer i;
```

```
always @(A,B,control)begin
```

```
    hold = 0;
```

```
    case (control)
```

```
    0: hold = A+B;
```

```
    1: begin
```

```
        if (B > A)begin
```

```
            hold = 0; end
```

```
        else begin hold = A-B; end
```

```
    end
```

```
    2: begin
```

```
        INI = A;
```

```
        for (i = 0; i<B; i = i + 1) begin
```

```
            hold = hold + INI;
```

```
        end
```

```
    end
```

```
    3: begin
```

```
        INI = A;
```

```
        for (i = 0; i < 4; i = i + 1) begin
```

```
            if (INI >= B) begin
```

```
                INI = INI - B;
```

```
                hold = hold+1; end
```

```
            end
```

```
        end
```

```
    4: hold = ~A;
```

```
    5: hold = A|B;
```

```
    6: hold = A&B;
```

```
    7: hold = A^B;
```

```
endcase
```

```
end
```

```
assign OUT = hold;
```

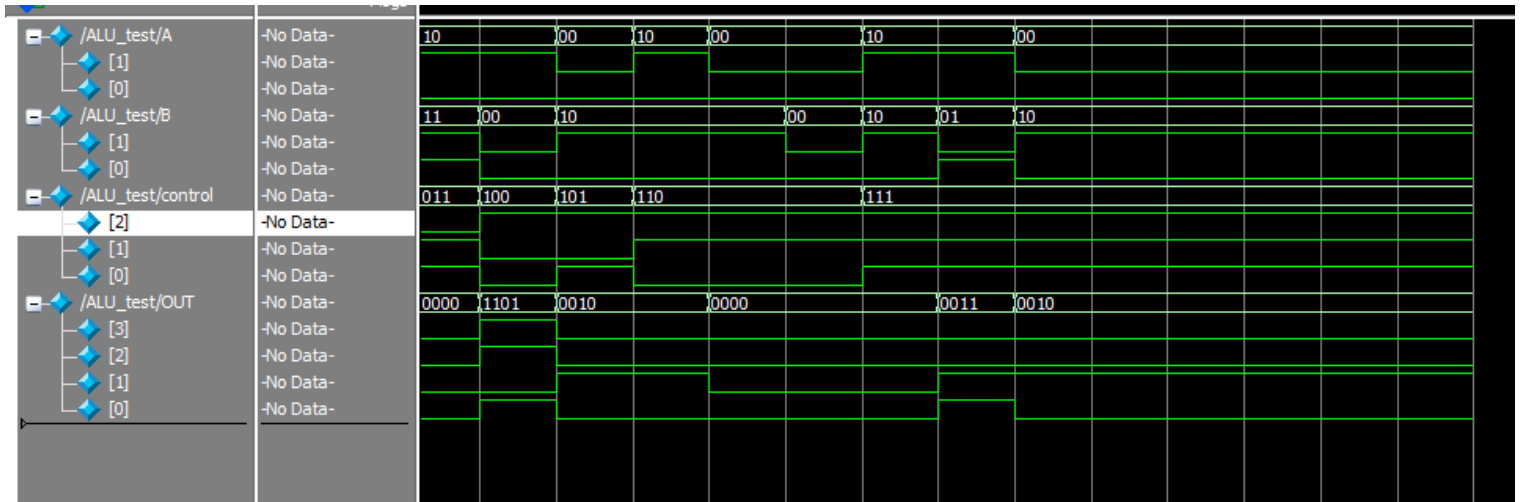
```
endmodule
```

```
module ALU_test();
```

```

reg [1:0] A,B;
reg [2:0] control;
wire [3:0] OUT;
ALU T (A,B,OUT,control);
initial begin
    A= 0;
    B = 0;
    control = 0;
end
initial begin
    #5 control = 0; A = 2; B = 3;
    #5 control = 1; A = 3; B = 3;
    #5 control = 2; A = 2; B = 3;
    #5 control = 3; A = 3; B = 2;
    #5 control = 3; A = 2; B = 3;
    #5 control = 4; A = 2; B = 0;
    #5 control = 5; A = 0; B = 2;
    #5 control = 6; A = 2; B = 2;
    #5 control = 6; A = 0; B = 2;
    #5 control = 6; A = 0; B = 0;
    #5 control = 7; A = 2; B = 2;
    #5 control = 7; A = 2; B = 1;
    #5 control = 7; A = 0; B = 2;
end
endmodule

```



#5 control = 3; A = 3; B = 3;