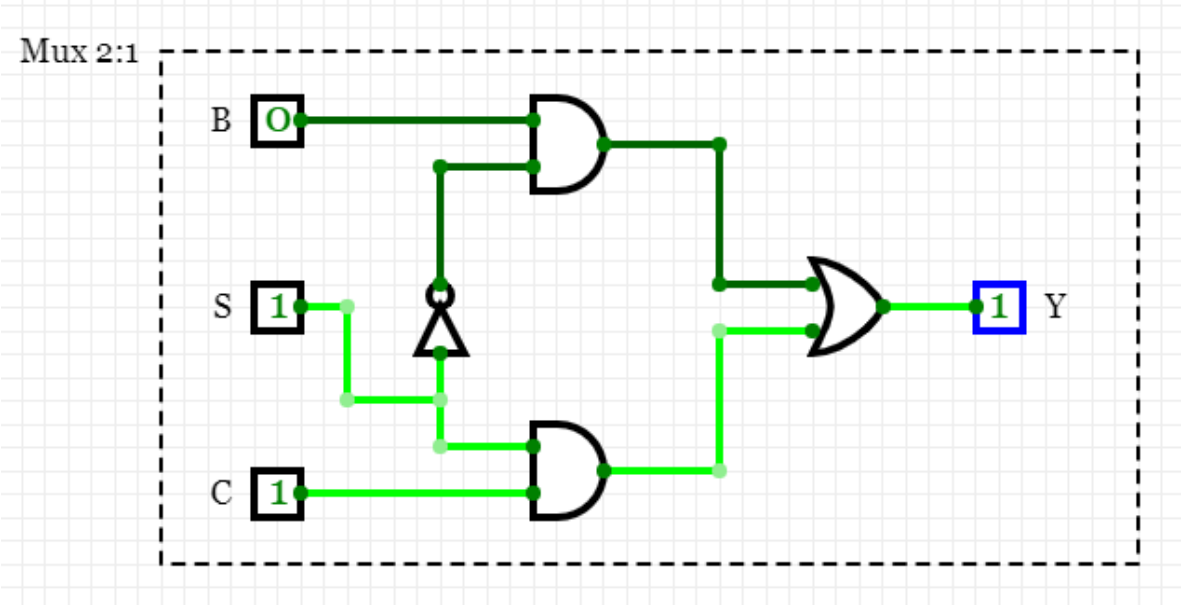
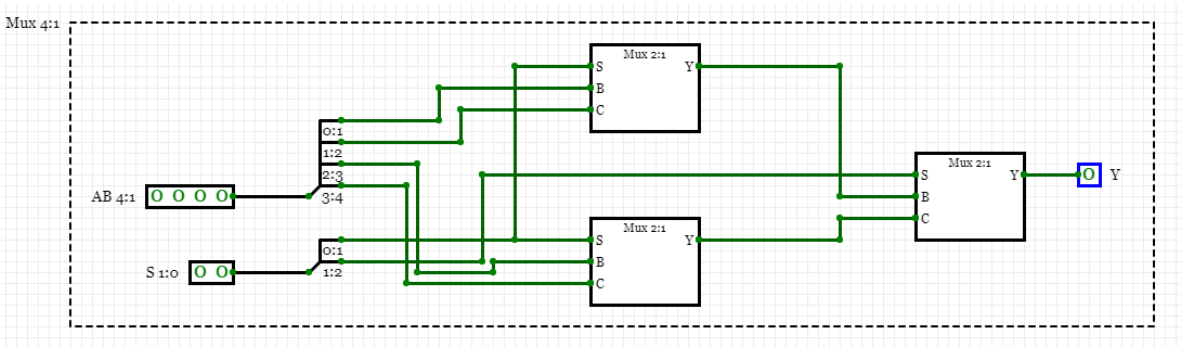
Ejercicio 2


Mux 2:1
B
0
S
1
C
1
1
Y


Mux 4:1
AB 4:1
0 0 0 0
S 1:0
0 0
0:1
1:2
2:3
3:4
Mux 2:1
S
B
C
Y
Mux 2:1
S
B
C
Y
Mux 2:1
S
B
C
Y
0
Y

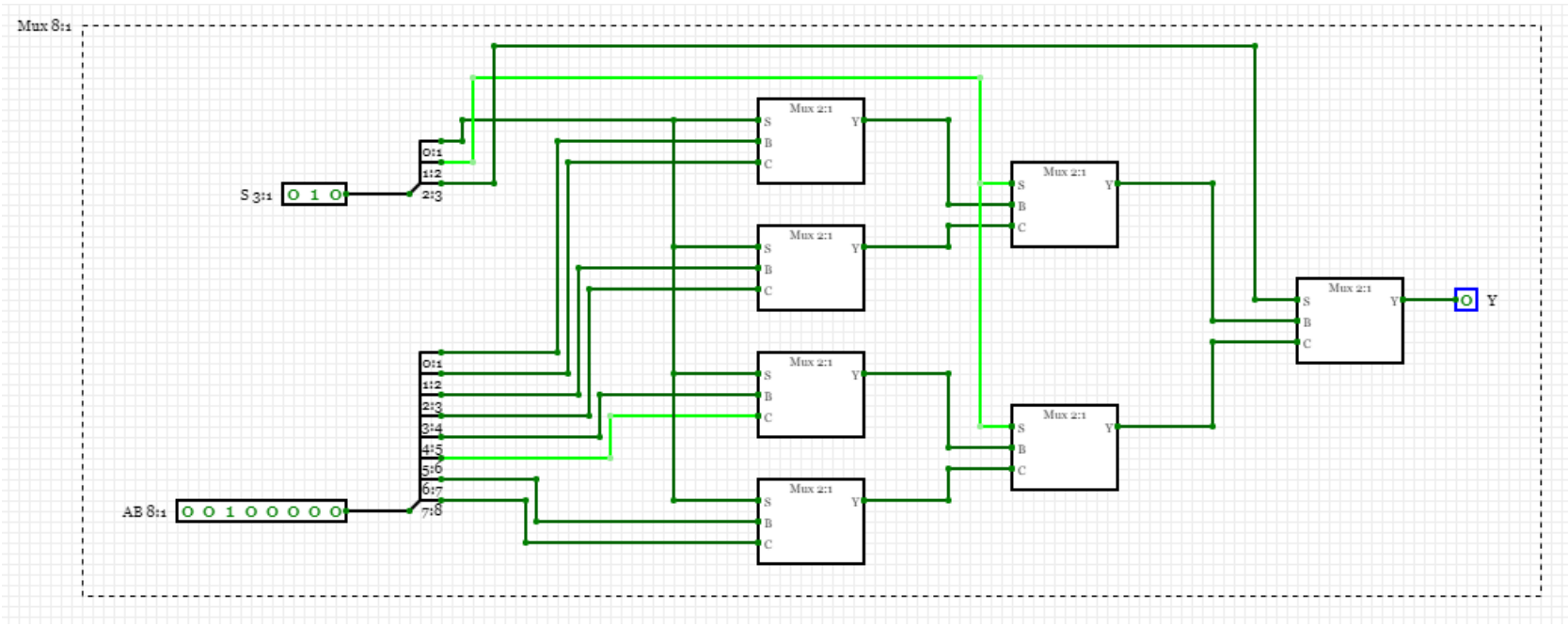

Mux 8:1
S 3:1
0 1 0
AB 8:1
0 0 1 0 0 0 0 0
0:1
1:2
2:3
3:4
4:5
5:6
6:7
7:8
Mux 2:1
S
B
C
Y
0
Y

Tabla 1 8:1

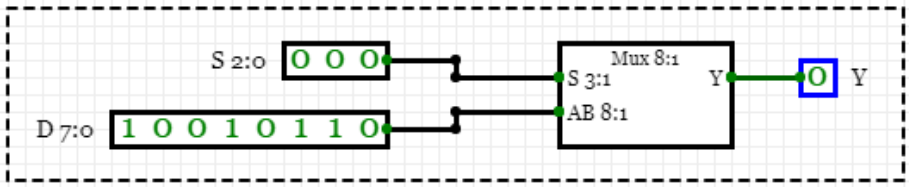


Tabla 1 4:1

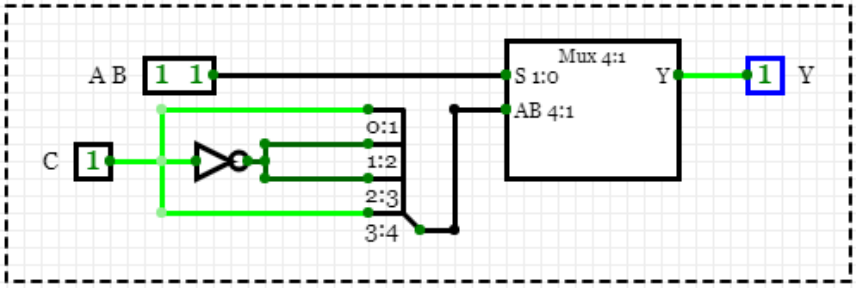


Tabla 1 2:1

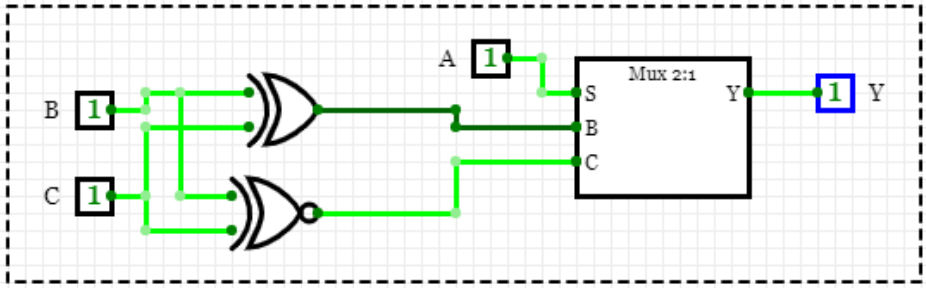


Tabla 2 8:1

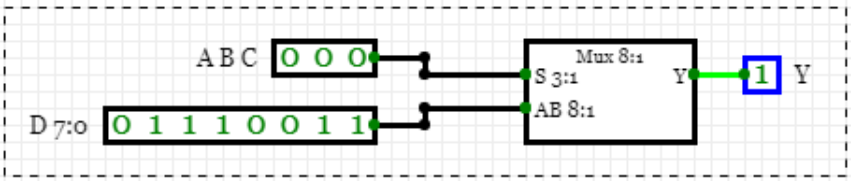


Tabla 2 4:1

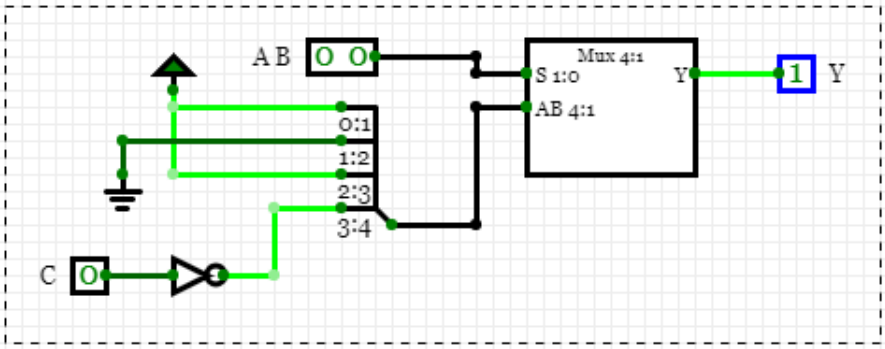
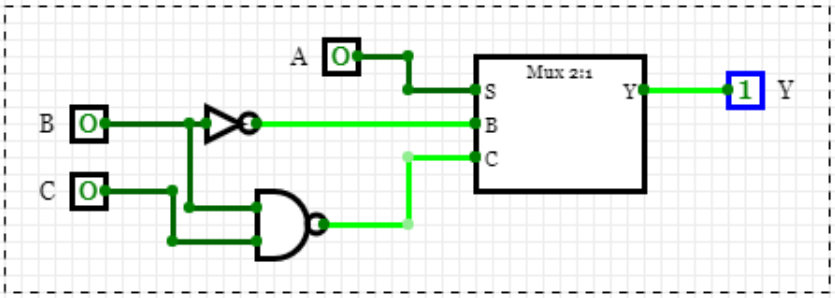
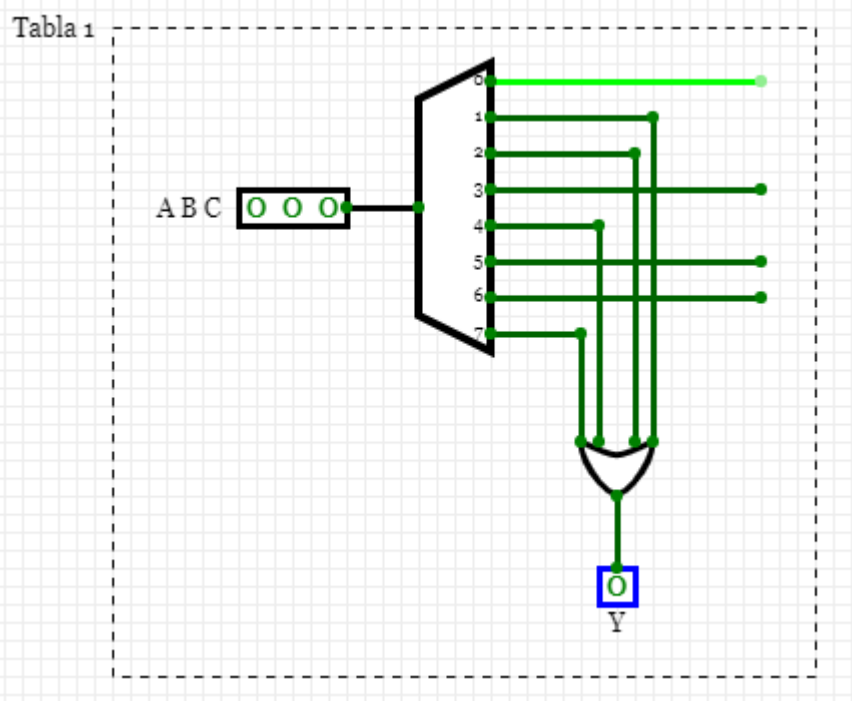
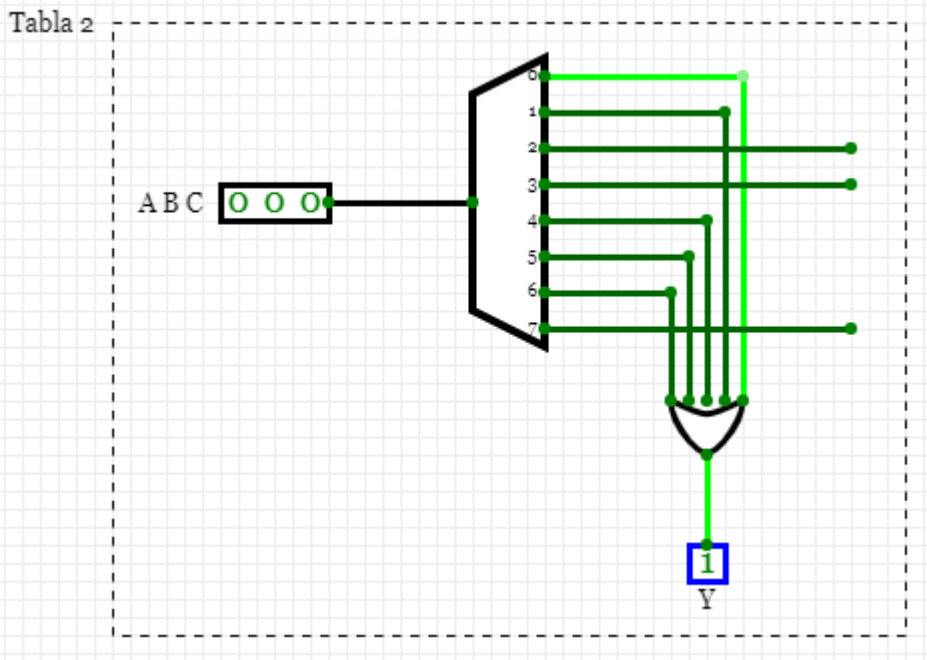


Tabla 2 2:1



Ejercicio 3





Ejercicio 4

Modulos

```
module Mux2(input wire d0, d1, s, output wire Y);

  assign Y = s ? d1 : d0;

endmodule

module Mux4(input wire d0, d1, d2, d3, s0, s1, output wire Y1);

  wire c1, c2;

  Mux2 bus1(d0, d1, s0, c1);
  Mux2 bus2(d2, d3, s0, c2);
  Mux2 bus3(c1, c2, s1, Y1);

endmodule

module Mux8(input wire d0, d1, d2, d3, d4, d5, d6, d7, s0, s1, s2, output wire Y2);

  wire c3, c4;

  Mux4 bus4(d0, d1, d2, d3, s0, s1, c3);
  Mux4 bus5(d4, d5, d6, d7, s0, s1, c4);
  Mux2 bus6(c3, c4, s2, Y2);

endmodule
```

```
module m8t1(input wire A, B, C, output wire Y);

  wire G, V;

  assign G = 0;
  assign V = 1;

  Mux8 u1(G, V, V, G, V, G, G, V, A, B, C, Y);

endmodule

module m4t1(input wire A, B, C, output wire Y);

  wire f0, f1;

  assign f0 = C;
  assign f1 = ~C;

  Mux4 u2(f0, f1, f1, f0, A, B, Y);

endmodule

module m2t1(input wire A, B, C, output wire Y);

  wire f0, f1;

  assign f0 =  (B^C);
  assign f1 = ~(B^C);

  Mux2 u3(f0, f1, A, Y);

endmodule
```

```
module m8t2(input wire A, B, C, output wire Y);

  wire G, V;

  assign G = 0;
  assign V = 1;

  Mux8 u4(V, V, G, G, V, V, V, G, A, B, C, Y);

endmodule

module m4t2(input wire A, B, C, output wire Y);

  wire G, V, f0;

  assign G = 0;
  assign V = 1;
  assign f0 = ~C;

  Mux4 u5(V, G, V, f0, A, B, Y);

endmodule

module m2t2(input wire A, B, C, output wire Y);

  wire f0, f1;

  assign f0 = ~B;
  assign f1 = ~(B & C);

  Mux2 u6(f0, f1, A, Y);

endmodule
```

Testbench

```
module testbench();

  reg p1, p2, p3, p4, p5, p6, p7, p8, p9, p10, p11, p12, p13, p14, p15, p16, p17, p18;
  wire sa1, sa2, sa3, sa4, sa5, sa6;

  m8t1 m1(p1, p2, p3, sa1);
  m4t1 m2(p4, p5, p6, sa2);
  m2t1 m3(p7, p8, p9, sa3);
  m8t2 m4(p10, p11, p12, sa4);
  m4t2 m5(p13, p14, p15, sa5);
  m2t2 m6(p16, p17, p18, sa6);

  initial begin

    $display("Mux 8:1 Tabla 01");
    $display("A B C | Y");
    $monitor("%b %b %b | %b", p1, p2, p3, sa1);

       p1 = 0; p2 = 0; p3 = 0;
    #1 p1 = 0; p2 = 0; p3 = 1;
    #1 p1 = 0; p2 = 1; p3 = 0;
    #1 p1 = 0; p2 = 1; p3 = 1;
    #1 p1 = 1; p2 = 0; p3 = 0;
    #1 p1 = 1; p2 = 0; p3 = 1;
    #1 p1 = 1; p2 = 1; p3 = 0;
    #1 p1 = 1; p2 = 1; p3 = 1;

  end

  initial begin
```

```
initial begin

#9

$display("\n");
$display("Mux 4:1 Tabla 01");
$display("A B C | Y");
$monitor("%b %b %b | %b", p4, p5, p6, sa2);

     p4 = 0; p5 = 0; p6 = 0;
  #1 p4 = 0; p5 = 0; p6 = 1;
  #1 p4 = 0; p5 = 1; p6 = 0;
  #1 p4 = 0; p5 = 1; p6 = 1;
  #1 p4 = 1; p5 = 0; p6 = 0;
  #1 p4 = 1; p5 = 0; p6 = 1;
  #1 p4 = 1; p5 = 1; p6 = 0;
  #1 p4 = 1; p5 = 1; p6 = 1;

end

initial begin
```

```
initial begin

#27

$display("\n");
$display("Mux 8:1 Tabla 02");
$display("A B C | Y");
$monitor("%b %b %b | %b", p10, p11, p12, sa4);

     p10 = 0; p11 = 0; p12 = 0;
  #1 p10 = 0; p11 = 0; p12 = 1;
  #1 p10 = 0; p11 = 1; p12 = 0;
  #1 p10 = 0; p11 = 1; p12 = 1;
  #1 p10 = 1; p11 = 0; p12 = 0;
  #1 p10 = 1; p11 = 0; p12 = 1;
  #1 p10 = 1; p11 = 1; p12 = 0;
  #1 p10 = 1; p11 = 1; p12 = 1;

end
```

```
initial begin

#18

$display("\n");
$display("Mux 2:1 Tabla 01");
$display("A B C | Y");
$monitor("%b %b %b | %b", p7, p8, p9, sa3);

     p7 = 0; p8 = 0; p9 = 0;
  #1 p7 = 0; p8 = 0; p9 = 1;
  #1 p7 = 0; p8 = 1; p9 = 0;
  #1 p7 = 0; p8 = 1; p9 = 1;
  #1 p7 = 1; p8 = 0; p9 = 0;
  #1 p7 = 1; p8 = 0; p9 = 1;
  #1 p7 = 1; p8 = 1; p9 = 0;
  #1 p7 = 1; p8 = 1; p9 = 1;

end
```

```
initial begin

#36

$display("\n");
$display("Mux 4:1 Tabla 02");
$display("A B C | Y");
$monitor("%b %b %b | %b", p13, p14, p15, sa5);

     p13 = 0; p14 = 0; p15 = 0;
  #1 p13 = 0; p14 = 0; p15 = 1;
  #1 p13 = 0; p14 = 1; p15 = 0;
  #1 p13 = 0; p14 = 1; p15 = 1;
  #1 p13 = 1; p14 = 0; p15 = 0;
  #1 p13 = 1; p14 = 0; p15 = 1;
  #1 p13 = 1; p14 = 1; p15 = 0;
  #1 p13 = 1; p14 = 1; p15 = 1;

end
```

```
    initial begin

    #45

    $display("\n");
    $display("Mux 2:1 Tabla 02");
    $display("A B C | Y");
    $monitor("%b %b %b | %b", p16, p17, p18, sa6);

        p16 = 0; p17 = 0; p18 = 0;
      #1 p16 = 0; p17 = 0; p18 = 1;
      #1 p16 = 0; p17 = 1; p18 = 0;
      #1 p16 = 0; p17 = 1; p18 = 1;
      #1 p16 = 1; p17 = 0; p18 = 0;
      #1 p16 = 1; p17 = 0; p18 = 1;
      #1 p16 = 1; p17 = 1; p18 = 0;
      #1 p16 = 1; p17 = 1; p18 = 1;

    end

    initial
    #54 $finish;

    initial begin

      $dumpfile("Lab_05_tb.vcd");
      $dumpvars(0, testbench);

    end

endmodule
```