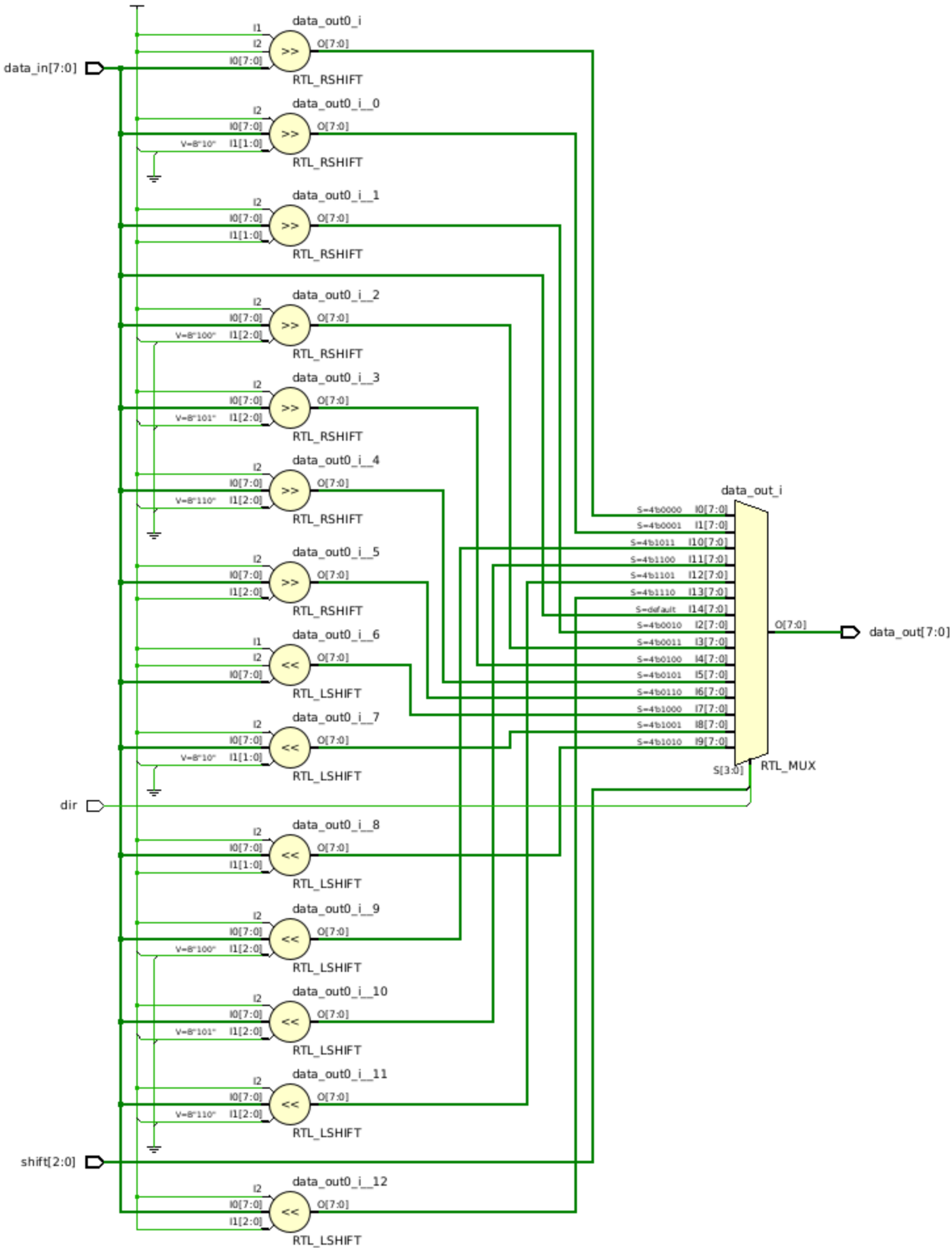
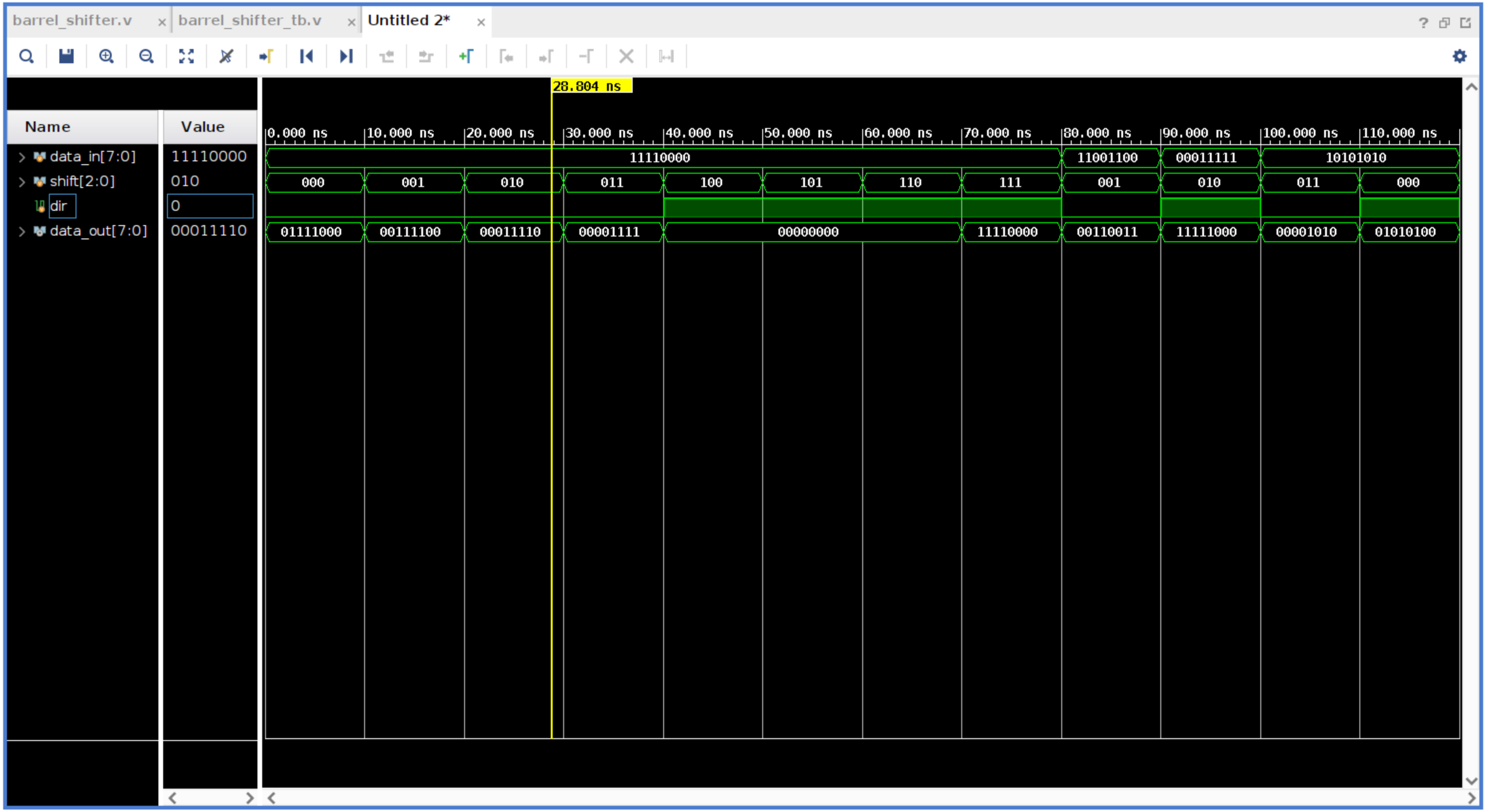
20 I/O Ports 134 Nets




barrel_shifter.v
barrel_shifter_tb.v
Untitled 2*
28.804 ns
Name
Value
data_in[7:0]
11110000
shift[2:0]
010
dir
0
data_out[7:0]
00011110
0.000 ns
10.000 ns
20.000 ns
30.000 ns
40.000 ns
50.000 ns
60.000 ns
70.000 ns
80.000 ns
90.000 ns
100.000 ns
110.000 ns
11110000
11001100
00011111
10101010
000
001
010
011
100
101
110
111
001
010
011
000
01111000
00111100
00011110
00001111
00000000
11110000
00110011
11111000
00001010
01010100

barrel_shifter.v

/home/itzzinfinity/Cozy Drive/100daysofRTL/day_063/project_1/project_1.srcs/sources_1/new/barrel_shifter.v

```
1   `timescale 1ns / 1ps
2   //////////////////////////////////////////////////////////////////////////////////
3   // Engineer: Anjan Prasad
4   // Create Date: 11/23/2024 07:57:54 AM
5   // Module Name: barrel_shifter
6   //////////////////////////////////////////////////////////////////////////////////
7
8   module barrel_shifter(
9       input [7:0] data_in,
10      input [2:0] shift,
11      input dir, // 0 for right, 1 for left
12      output reg [7:0] data_out
13      );
14
15      always @(*) begin
16          case ({dir, shift})
17              4'd0: data_out = data_in >> 1; // Right shift by 1
18              4'd1: data_out = data_in >> 2; // Right shift by 2
19              4'd2: data_out = data_in >> 3; // Right shift by 3
20              4'd3: data_out = data_in >> 4; // Right shift by 4
21              4'd4: data_out = data_in >> 5; // Right shift by 5
22              4'd5: data_out = data_in >> 6; // Right shift by 6
23              4'd6: data_out = data_in >> 7; // Right shift by 7
24
25              /*                  Dir Change                  */
26
27              4'd8: data_out = data_in << 1; // Left shift by 1
28              4'd9: data_out = data_in << 2; // Left shift by 2
29              4'd10: data_out = data_in << 3; // Left shift by 3
30              4'd11: data_out = data_in << 4; // Left shift by 4
31              4'd12: data_out = data_in << 5; // Left shift by 5
32              4'd13: data_out = data_in << 6; // Left shift by 6
33              4'd14: data_out = data_in << 7; // Left shift by 7
34              default: data_out = data_in;
35          endcase
36      end
37
38
39
40  endmodule
41
```

barrel_shifter_tb.v

/home/itzzinfinity/Cozy Drive/100daysofRTL/day_063/project_1/project_1.srcs/sim_1/new/barrel_shifter_tb.v

```
1  `timescale 1ns / 1ps
2  //////////////////////////////////////////////////////////////////////////////////
3  // Engineer: Anjan Prasad
4  // Create Date: 11/23/2024 08:11:41 AM
5  // Module Name: barrel_shifter_tb
6  //////////////////////////////////////////////////////////////////////////////////
7
8
9  module barrel_shifter_tb;
10     reg [7:0] data_in;
11     reg [2:0] shift;
12     reg dir;
13     wire [7:0] data_out;
14
15     barrel_shifter DUT (.data_in(data_in),.shift(shift),.dir(dir),.data_out(data_out));
16
17     initial begin
18
19         data_in = 8'b11110000;
20         dir = 0;
21         shift = 3'b000;
22
23
24         #10 shift = 3'b001; dir = 0;
25         #10 shift = 3'b010; dir = 0;
26         #10 shift = 3'b011; dir = 0;
27         #10 shift = 3'b100; dir = 1;
28         #10 shift = 3'b101; dir = 1;
29         #10 shift = 3'b110; dir = 1;
30         #10 shift = 3'b111; dir = 1;
31
32         #10 data_in = 8'b11001100; shift = 3'b001; dir = 0;
33         #10 data_in = 8'b00011111; shift = 3'b010; dir = 1;
34         #10 data_in = 8'b10101010; shift = 3'b011; dir = 0;
35
36         #10 shift = 3'b000; dir = 1; // No shift
37
38         #10 $stop;
39     end
40
41     initial begin
42         $monitor("At time %t: data_in = %b, shift = %b, dir = %b, data_out = %b",
43                  $time, data_in, shift, dir, data_out);
44     end
45 endmodule
46
```