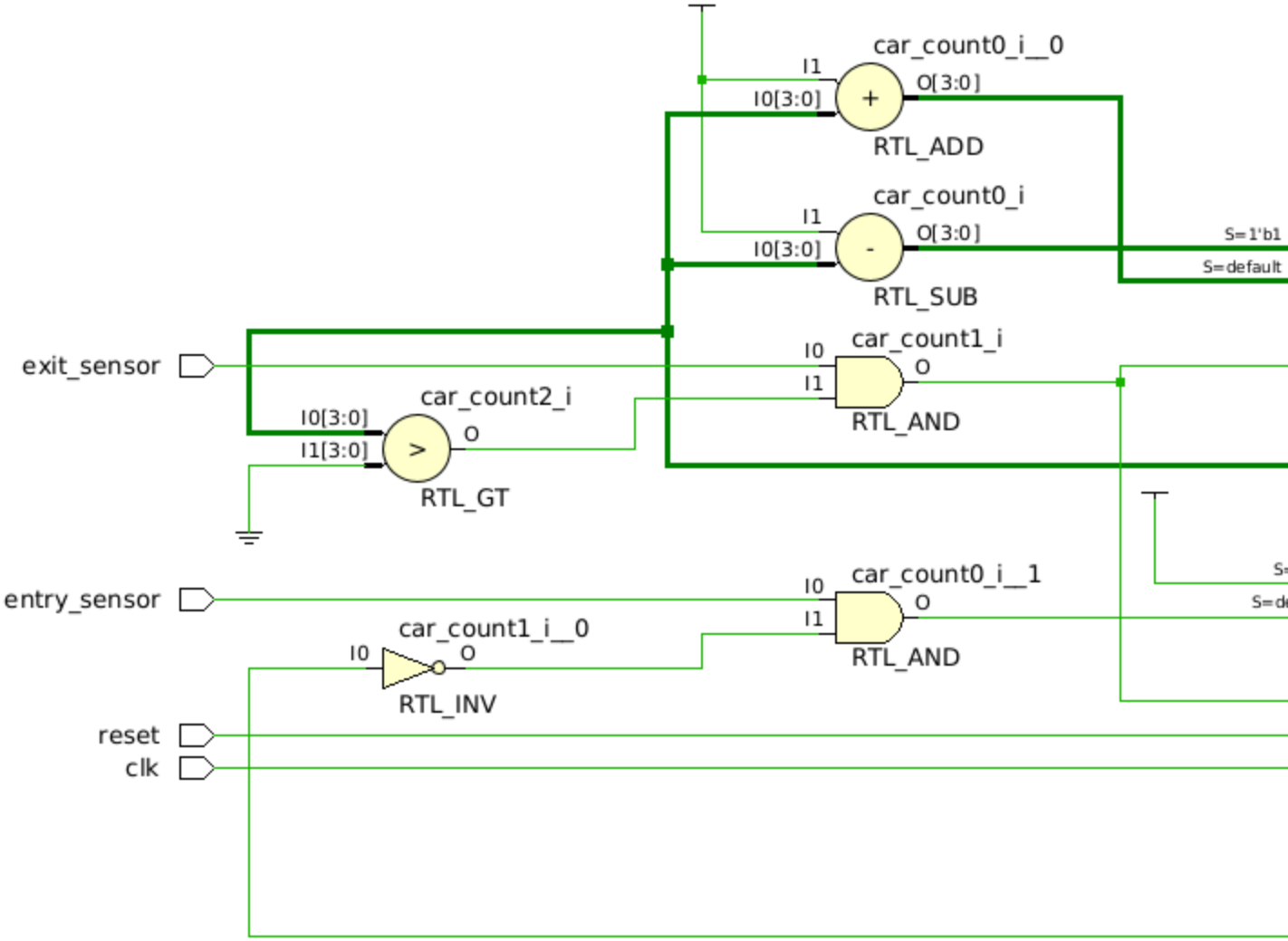
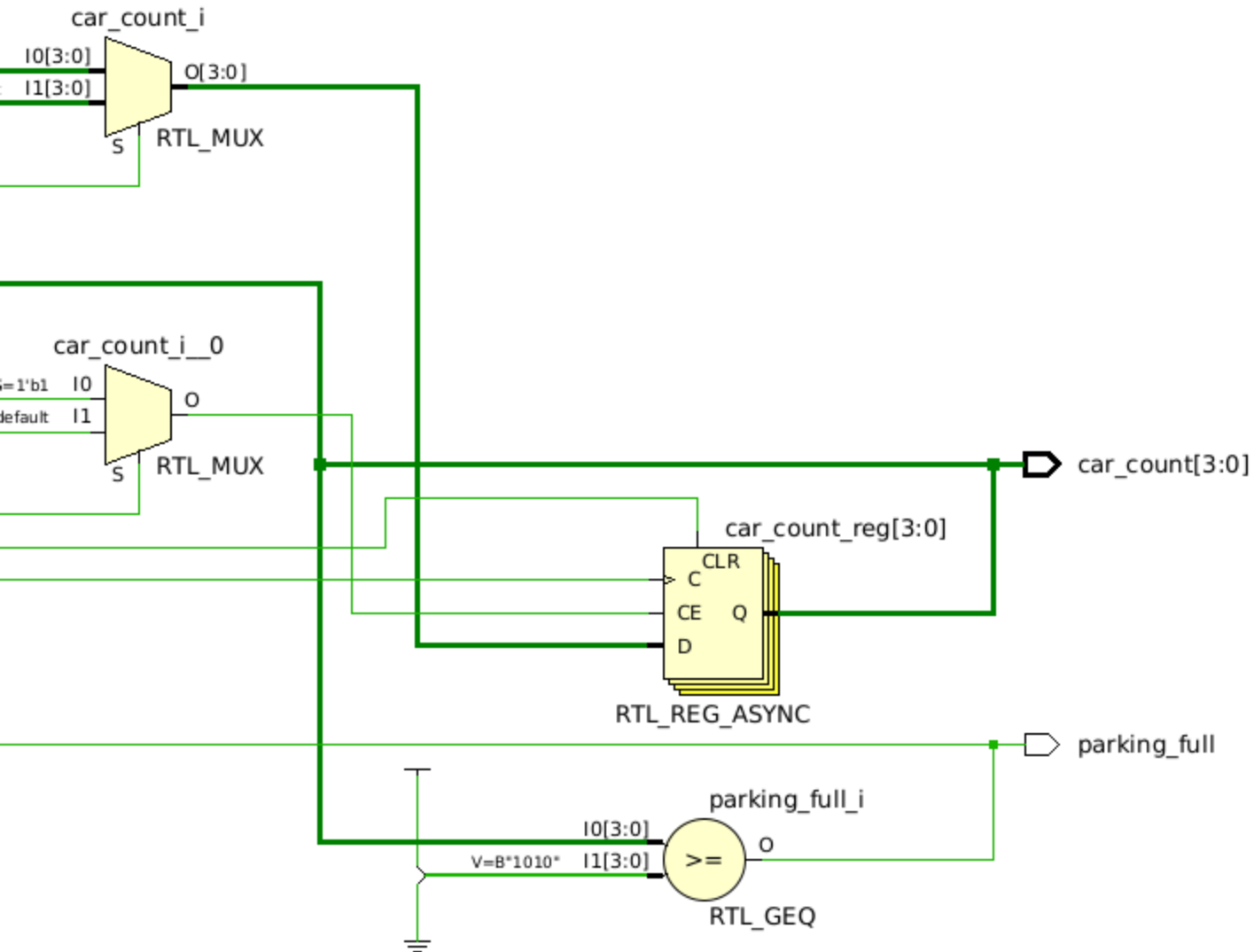
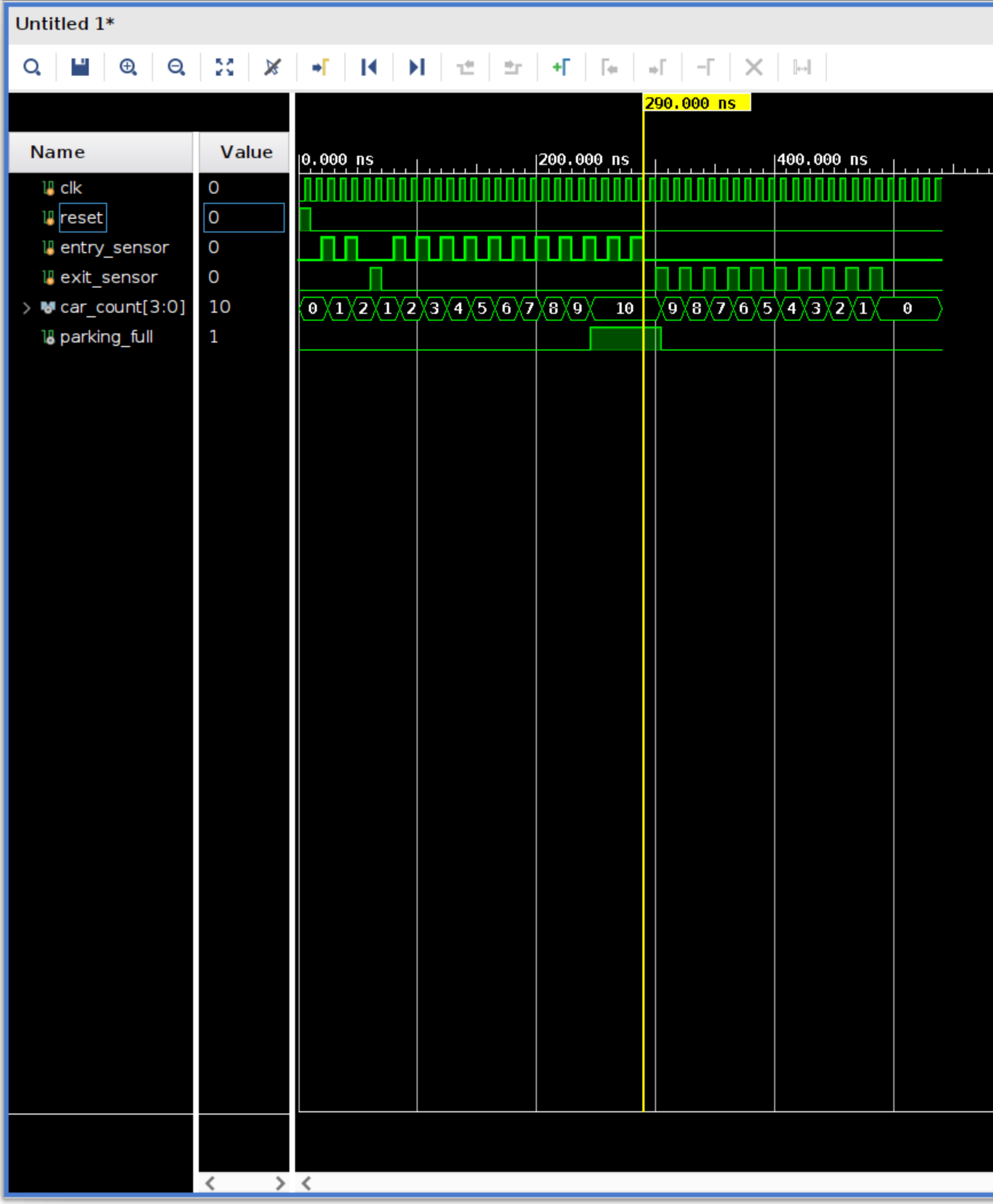
Schematic

13 Cells 9 I/O Ports 28 Nets




car_count_i
I0[3:0]
I1[3:0]
O[3:0]
S
RTL_MUX
car_count_i__0
I0
I1
O
S
RTL_MUX
car_count[3:0]
car_count_reg[3:0]
CLR
C
CE
Q
D
RTL_REG_ASYNC
parking_full
parking_full_i
I0[3:0]
V=B"1010"
I1[3:0]
>=
O
RTL_GEQ


Untitled 1*
Name
Value
clk
0
reset
0
entry_sensor
0
exit_sensor
0
car_count[3:0]
10
parking_full
1
290.000 ns
0.000 ns
200.000 ns
400.000 ns
0 1 2 1 2 3 4 5 6 7 8 9 10 9 8 7 6 5 4 3 2 1 0

car_parking_system.v

/home/itzzinfinity/Cozy Drive/100daysofRTL/day_096/project_1/project_1.srcs/sources_1/new/car_parking_system.v

```
1   `timescale 1ns / 1ps
2   //////////////////////////////////////////////////////////////////////////////////
3   // Engineer: Anjan Prasad
4   // Create Date: 12/26/2024 08:21:46 AM
5   // Module Name: car_parking_system
6   //////////////////////////////////////////////////////////////////////////////////
7
8   module car_parking_system #(
9       parameter MAX_CAPACITY = 10
10  ) (
11      input clk,
12      input reset,
13      input entry_sensor,   // Sensor for car entry
14      input exit_sensor,    // Sensor for car exit
15      output reg [3:0] car_count,
16      output parking_full
17  );
18
19      // Parking full signal
20      assign parking_full = (car_count >= MAX_CAPACITY);
21
22      always @(posedge clk or posedge reset) begin
23          if (reset) begin
24              car_count <= 0;
25          end else begin
26              // Car entering
27              if (entry_sensor && !parking_full) begin
28                  car_count <= car_count + 1;
29              end
30              // Car exiting
31              if (exit_sensor && car_count > 0) begin
32                  car_count <= car_count - 1;
33              end
34          end
35      end
36
37  endmodule
38
```

car_parking_system_tb.v

/home/itzzinfinity/Cozy Drive/100daysofRTL/day_096/project_1/project_1.srcs/sim_1/new/car_parking_system_tb.v

```
1   `timescale 1ns / 1ps
2   //////////////////////////////////////////////////////////////////////////////////
3   // Engineer: Anjan Prasad
4   // Create Date: 12/26/2024 08:23:08 AM
5   // Module Name: car_parking_system_tb
6   //////////////////////////////////////////////////////////////////////////////////
7
8   module car_parking_system_tb;
9
10      parameter MAX_CAPACITY = 10;
11
12      reg clk,reset,entry_sensor,exit_sensor;
13      wire [3:0] car_count;
14      wire parking_full;
15
16      car_parking_system #(MAX_CAPACITY) DUT (
17          .clk(clk),.reset(reset),
18          .entry_sensor(entry_sensor),.exit_sensor(exit_sensor),
19          .car_count(car_count),.parking_full(parking_full)
20      );
21
22      always #5 clk = ~clk;
23
24      initial begin
25
26          clk = 0;
27          reset = 1;
28          entry_sensor = 0;
29          exit_sensor = 0;
30
31          #10 reset = 0;
32          #10 entry_sensor = 1; #10 entry_sensor = 0; // 1 car enters
33          #10 entry_sensor = 1; #10 entry_sensor = 0; // Another car enters
34          #10 exit_sensor = 1; #10 exit_sensor = 0;    // Simulate cars exiting
35
36          repeat (10) begin    // Simulate parking full scenario
37              #10 entry_sensor = 1; #10 entry_sensor = 0; // Cars enter until full
38          end
39          #10 entry_sensor = 1; #10 entry_sensor = 0;    // Try entering when parking i
40
41          repeat (MAX_CAPACITY) begin    // Cars exiting after being full
42              #10 exit_sensor = 1; #10 exit_sensor = 0;
43          end
44          #50 $finish;
45      end
46      initial begin
47  $monitor("Time=%0t | Reset=%b | Entry Sensor=%b | Exit Sensor=%b | Car Count=%d | Par
48                      $time, reset, entry_sensor, exit_sensor, car_count, parking_full);
49      end
50  endmodule
```

Tcl Console

```
Time=105000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 3 | Parking Full=0
Time=110000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 3 | Parking Full=0
Time=120000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 3 | Parking Full=0
Time=125000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 4 | Parking Full=0
Time=130000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 4 | Parking Full=0
Time=140000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 4 | Parking Full=0
Time=145000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 5 | Parking Full=0
Time=150000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 5 | Parking Full=0
Time=160000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 5 | Parking Full=0
Time=165000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 6 | Parking Full=0
Time=170000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 6 | Parking Full=0
Time=180000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 6 | Parking Full=0
Time=185000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 7 | Parking Full=0
Time=190000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 7 | Parking Full=0
Time=200000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 7 | Parking Full=0
Time=205000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 8 | Parking Full=0
Time=210000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 8 | Parking Full=0
Time=220000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 8 | Parking Full=0
Time=225000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 9 | Parking Full=0
Time=230000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 9 | Parking Full=0
Time=240000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count= 9 | Parking Full=0
Time=245000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count=10 | Parking Full=1
Time=250000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count=10 | Parking Full=1
Time=260000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count=10 | Parking Full=1
Time=270000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count=10 | Parking Full=1
Time=280000 | Reset=0 | Entry Sensor=1 | Exit Sensor=0 | Car Count=10 | Parking Full=1
Time=290000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count=10 | Parking Full=1
Time=300000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count=10 | Parking Full=1
Time=305000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 9 | Parking Full=0
Time=310000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 9 | Parking Full=0
Time=320000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 9 | Parking Full=0
Time=325000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 8 | Parking Full=0
Time=330000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 8 | Parking Full=0
Time=340000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 8 | Parking Full=0
Time=345000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 7 | Parking Full=0
Time=350000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 7 | Parking Full=0
Time=360000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 7 | Parking Full=0
Time=365000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 6 | Parking Full=0
Time=370000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 6 | Parking Full=0
Time=380000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 6 | Parking Full=0
Time=385000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 5 | Parking Full=0
Time=390000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 5 | Parking Full=0
Time=400000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 5 | Parking Full=0
Time=405000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 4 | Parking Full=0
Time=410000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 4 | Parking Full=0
Time=420000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 4 | Parking Full=0
Time=425000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 3 | Parking Full=0
Time=430000 | Reset=0 | Entry Sensor=0 | Exit Sensor=0 | Car Count= 3 | Parking Full=0
Time=440000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 3 | Parking Full=0
Time=445000 | Reset=0 | Entry Sensor=0 | Exit Sensor=1 | Car Count= 2 | Parking Full=0
```

Type a Tcl command here