CAR PARKING SYSTEM

ABSTRACT IDEA

PRESENTED BY:

RAJENDRA SINGH(33%)

SURENDRA BASKEY(33%)

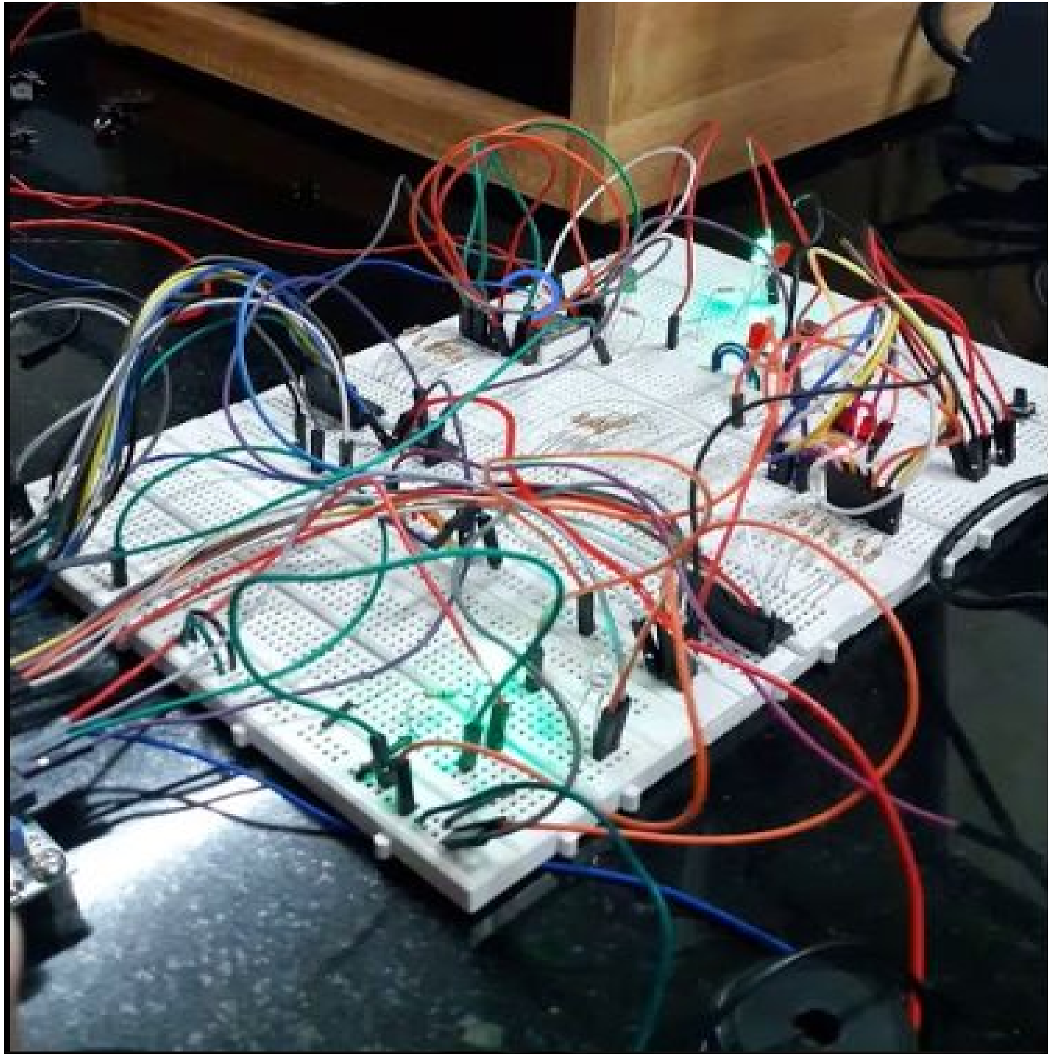
MANOJ KUMAR S(33%)

ABSTRACT IDEA

Aim of the project is to design an advanced parking system and implement it.

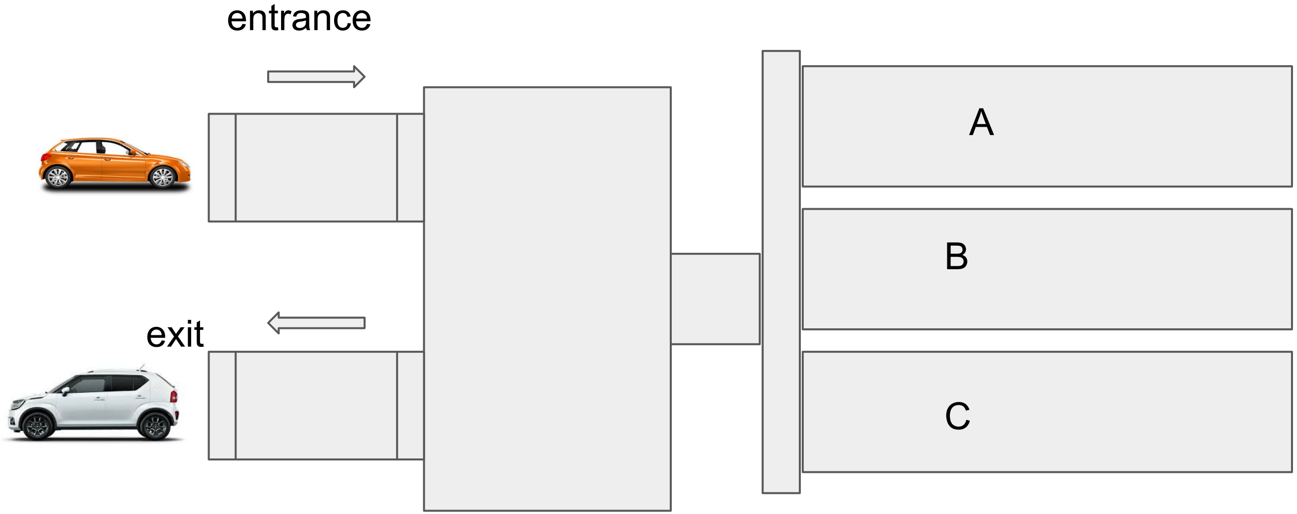
The car parking system is an embedded system which contains three class of parking system.At the entrance gate customer has to buy tickets.Each ticket contains an unique password.The customer is allotted the parking area which is mentioned in the ticket.The customer has to enter the password at the entrance of

The allotted gate.Gate gets opened if the password entered by the customer matches with the password written on the ticket.Otherwise customer is denied to park his/her vehicle and alarm will be ringed.The number of vehicle already parked in the garage is displayed on the display board.

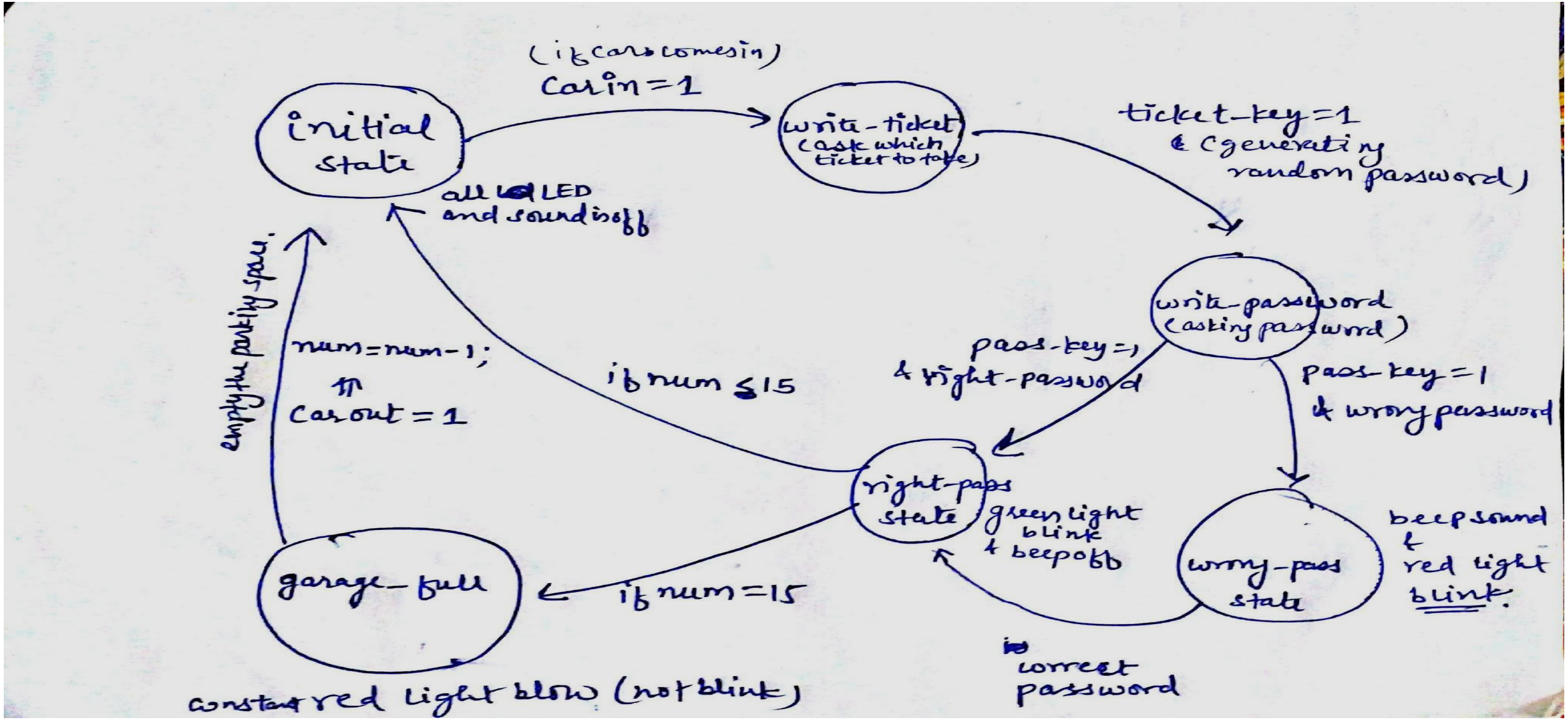


DIAGRAM

BLOCK DIAGRAM



STATE DIAGRAM


(if cars comes in)
Car in=1
initial state
all LED and sound is off
write-ticket (ask which ticket to take)
ticket-key=1 & (generating random password)
write-password (asking password)
pass-key=1 & right-password
pass-key=1 & wrong password
right-pass state
green light blink & beep off
wrong-pass state
beep sound & red light blink.
correct password
if num ≤15
if num=15
garage-full
constant red light blow (not blink)
num=num-1;
if
Car out=1
empty the parking space.

Logic used

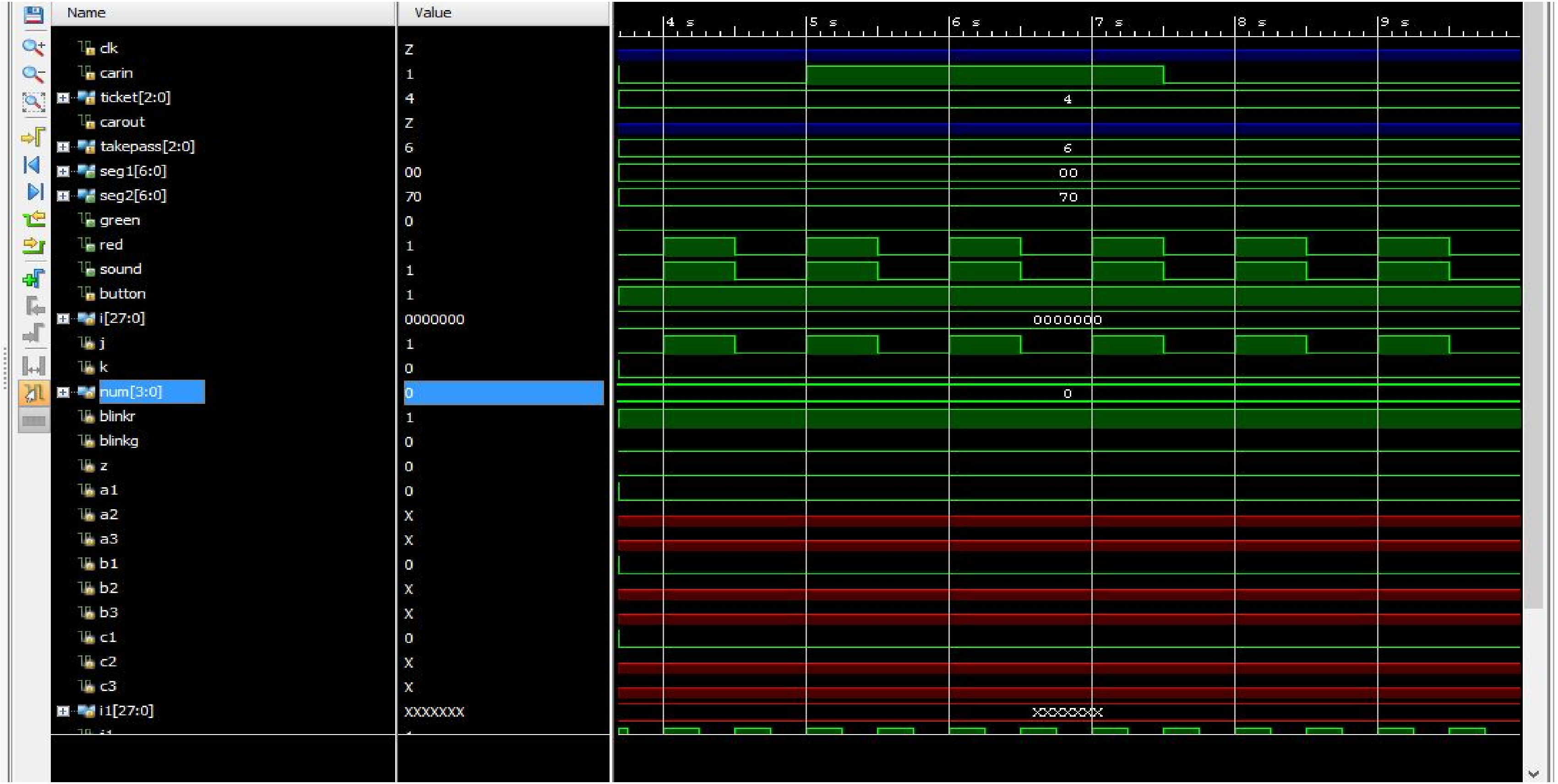
Mealy machine with inputs carin, ticket,password

Updown counter to display the no. of car present the garage

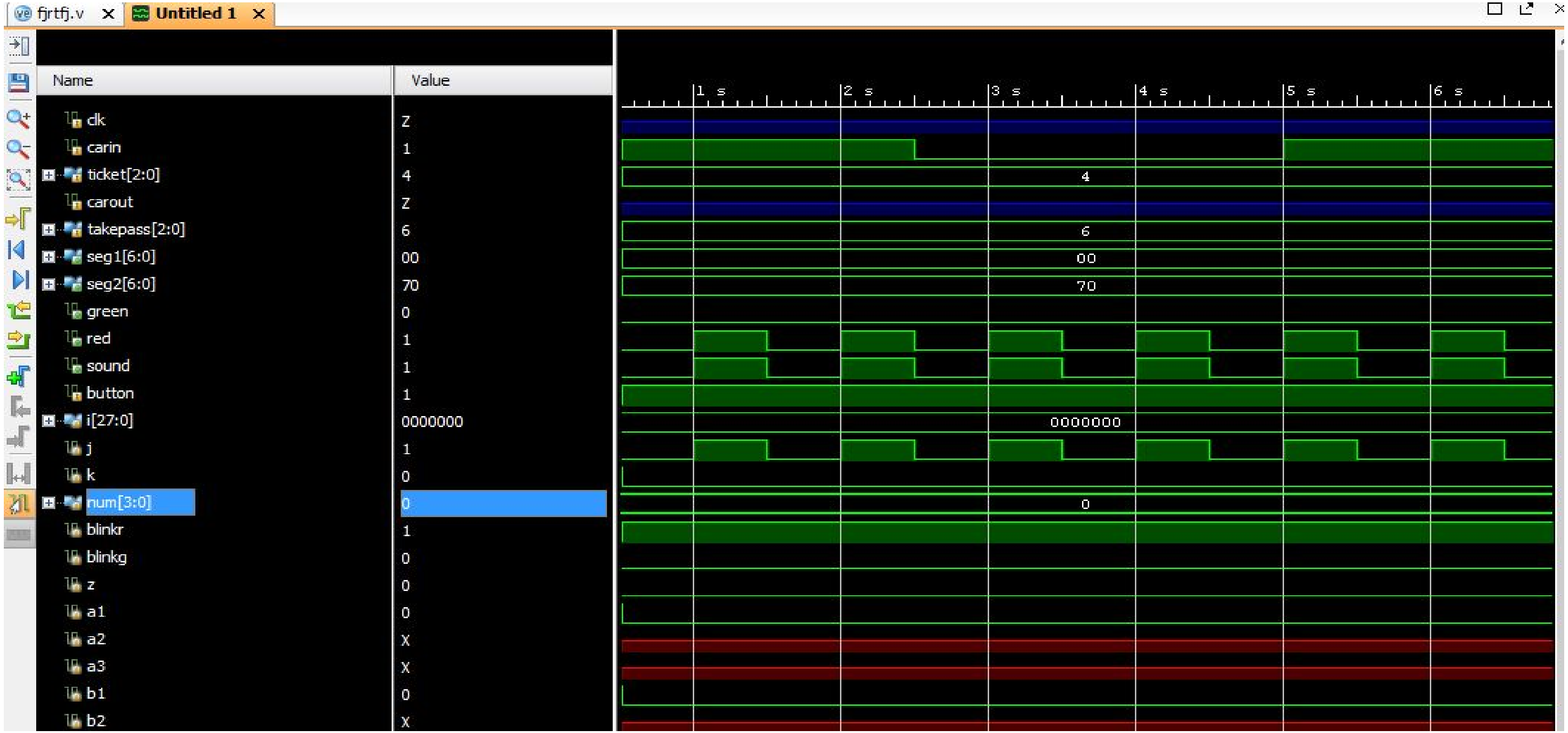
Random number generator of password and password matching

Alarm for wrong entry of password

simulation



Name	Value
clk	Z
carin	1
ticket[2:0]	4
carout	Z
takepass[2:0]	6
seg1[6:0]	00
seg2[6:0]	70
green	0
red	1
sound	1
button	1
i[27:0]	0000000
j	1
k	0
num[3:0]	0
blinkr	1
blinkg	0
z	0
a1	0
a2	X
a3	X
b1	0
b2	X
b3	X
c1	0
c2	X
c3	X
i1[27:0]	XXXXXXX



Name	Value
clk	Z
carin	1
ticket[2:0]	4
carout	Z
takepass[2:0]	6
seg1[6:0]	00
seg2[6:0]	70
green	0
red	1
sound	1
button	1
i[27:0]	0000000
j	1
k	0
num[3:0]	0
blinkr	1
blinkg	0
z	0
a1	0
a2	X
a3	X
b1	0
b2	X

CODE :

```
`timescale 1ns / 1ps
//////////////////////////////////////////////////////////////////////////////////
// Company:
// Engineer:
//
// Create Date: 11/07/2017 08:49:40 PM
// Design Name:
// Module Name: smart
// Project Name:
// Target Devices:
// Tool Versions:
// Description:
//
// Dependencies:
//
// Revision:
// Revision 0.01 - File Created
// Additional Comments:
//
//////////////////////////////////////////////////////////////////////////////////


module smart(input clk, input carin, input [2:0]ticket ,
input carout , input
[2:0]takepass ,output reg  [6:0]seg1 , seg2 , output
reg green ,red,sound , input button,button1);
reg [27:0]i;
reg j,k;
reg [3:0]num;
reg blinkr, blinkg,z;
reg  a1,a2,a3,b1,b2,b3,c1,c2,c3;
reg [27:0]i1;
reg j1;
reg[2:0] pass;
reg blinks,blinks1;
reg [20:0]count;
reg ind;
initial
begin
blinkr=1'b0;
red=1'b0;
z=1'b0;
blinkg=1'b0;
blinks=1'b0;
blinks1=1'b0;
green=1'b0;
 i=27'b0;
j=1'b0;
k=1'b1;
ind=1'b0;
num=3'b0;
sound=1'b0;
count=20'b0;
pass = 3'b000; // default password
end

always @ (posedge clk) // reduced clock
begin
i=i+1;
if(i==62500000)
begin
j=~j;
i=0;
end
end
```

```
always @ (posedge clk) // reduced clock
begin
i1=i1+1;
if(i1==31250000)
begin
j1=~j1;
i1=0;
end
end

always @ (posedge j)
begin
if(carin==1)
begin
//red = 0;
blinkg = 0;
if(k)
begin

 if(ticket[2]==1 && button==1)
   begin
       k=0;
      ind=0;
    a1=pass[2];
    b1=pass[1];
    c1=pass[0];
    pass[2]= ( ( (~b1)&(~c1) )| ( (~a1) &c1 ));
    pass[1]= ( ((~b1)&(~c1)) | (a1&b1));
    pass[0]= ((b1&c1)| (a1&c1)|( (~a1)&(~b1)&(~c1)
));
   end
  else if(ticket[1]==1 && button==1 )
   begin
      k=0;
      ind=0;
   a2= pass[2];
   b2= pass[1];
   c2= pass[0];
   pass[2]= ((c2));
   pass[1]= ( ((~a2)&(~b2))|(b2&c2) );
   pass[0]= ( ( (~b2)&(c2) )| ( (~a2) &c2 ));
   end
   else if(ticket[0]==1 && button==1)
   begin
      k=0;
      ind=0;
   a3=(pass[2]);
   b3=(pass[1]);
   c3=(pass[0]);
   pass[2]= ((a3&b3)|(c3));
   pass[1]= ( ( (b3)&(~c3) )| ( (~a3) &c3 ));
   pass[0]= (b3|(c3&a3));
   end

 end
end

if(ind==0 && k==0)
begin
 if(button1)
  begin
    if((pass[2]==takepass[2] && pass[1]==takepass[1] &&
pass[0]==takepass[0]))
      begin
     k=1;
     blinkg=1;
     blinkr=0;
     blinks=0;
     num=num+1;
     ind=1;
     end
      else
       begin
         blinks=1;
         blinkg=0;
         blinkr=1;
       end
     end
end
if(carout==1)
begin
num=num-1;
end

if(num==7)
begin
  z=1;
  blinks=0;
  blinkg=0;
  blinkr=0;
 end
 else
 begin
  z=0;
 end
 case(num)
  3'b000 : seg1=7'b0000000;
  3'b001 : seg1=7'b0110000;
  3'b010 : seg1=7'b1101101;
  3'b011 : seg1=7'b1111001;
  3'b100 : seg1=7'b0110011;
  3'b101 : seg1=7'b1011011;
  3'b110 : seg1=7'b1011111;
  3'b111 : seg1=7'b1110000;
  default: seg1=7'b0000000;

  endcase

    case(pass)
  3'b000 : seg2=7'b0000000;
  3'b001 : seg2=7'b0110000;
  3'b010 : seg2=7'b1101101;
  3'b011 : seg2=7'b1111001;
  3'b100 : seg2=7'b0110011;
  3'b101 : seg2=7'b1011011;
  3'b110 : seg2=7'b1011111;
  3'b111 : seg2=7'b1110000;
  3'b000 : seg2=7'b1111111;
  3'b001 : seg2=7'b1111011;
 default : seg2=7'b0000000;

  endcase

end
```

```
always @ (posedge j1)
begin

if(blinkg==1)
begin
red=0;
green = ~green;
end
else if(z==1)
begin
red=1;
green=0;
end
if(blinkr==1)
begin
green=0;
red=~red;
end
else if(z==1)
begin
red=1;
green=0;
end

blinks1=blinks;
if(blinks1==1)
begin
count=count+1;
if(count==10)
begin
 blinks1=0;
 count=0;
end
sound=~sound;
end
```

```
end
endmodule
```

Conclusion

We have successfully made the car parking system with the idea of mealy machine

Parking system is helpful in reducing the traffic problem in the urban area.

It will avoid the crowding of vehicle outside any building or side of road.

Hence it will also reduce the chance of accidents in our daily life.