**DESIGN CODE FOR VENDING MACHINE**

module vending\_machine(sel,item,change,clk,coin,rst);

output reg item;

output reg [3:0] change;

input [3:0] coin;

input sel;

input clk,rst;

reg [1:0] state;

reg [1:0] next\_state;

parameter [1:0] s0=2'b00;

parameter [1:0] s5=2'b01;

parameter [1:0] s10=2'b10;

parameter [1:0] s15=2'b11;

always @(posedge clk or rst)

begin

if (rst)

state<=s0;

else

state<=next\_state;

end

always @(posedge clk or rst)

begin

case (state)

s0:

begin

if (coin==4'b0000)

begin

if(sel==1)

begin

next\_state<=s0;

change<=4'b0000;

item<=0;

end

else

begin

next\_state<=s0;

change<=4'b0000;

item<=0;

end

end

else if(coin==4'b0101)

begin

if(sel==1)

begin

next\_state<=s5;

change<=4'b0000;

item<=0;

end

else

begin

next\_state<=s5;

change<=4'b0000;

item<=0;

end

end

else if(coin==4'b1010)

begin

if(sel==1)

begin

next\_state<=s10;

change<=4'b0000;

item<=0;

end

else

begin

next\_state<=s10;

change<=4'b0000;

item<=0;

end

end

end

s5:

begin

if (coin==4'b0000)

begin

if(sel==1)

begin

next\_state<=s0;

change<=4'b0101;

item<=0;

end

else

begin

next\_state<=s0;

change<=4'b0101;

item<=0;

end

end

else if(coin==4'b0101)

begin

if(sel==1)

begin

next\_state<=s10;

change<=4'b0000;

item<=0;

end

else

begin

next\_state<=s10;

change<=4'b0000;

item<=0;

end

end

else if(coin==4'b1010)

begin

if(sel==1)

begin

next\_state<=s15;

change<=4'b0000;

item<=0;

end

else

begin

next\_state<=s0;

change<=4'b0000;

item<=1;

end

end

end

s10:

begin

if (coin==4'b0000)

begin

if(sel==1)

begin

next\_state<=s0;

change<=4'b1010;

item<=0;

end

else

begin

next\_state<=s0;

change<=4'b1010;

item<=0;

end

end

else if(coin==4'b0101)

begin

if(sel==1)

begin

next\_state<=s15;

change<=4'b0000;

item<=0;

end

else

begin

next\_state<=s0;

change<=4'b0000;

item<=1;

end

end

else if(coin==4'b1010)

begin

if(sel==1)

begin

next\_state<=s0;

change<=4'b0000;

item<=1;

end

else

begin

next\_state<=s0;

change<=4'b0101;

item<=1;

end

end

end

s15:

begin

if (coin==4'b0000)

begin

if (sel==1)

begin

next\_state<=s0;

change<=4'b1111;

item<=0;

end

else

begin

next\_state<=s0;

change<=4'b0000;

item<=1;

end

end

else if(coin==4'b0101)

begin

if(sel==1)

begin

next\_state<=s0;

change<=4'b0000;

item<=1;

end

else

begin

next\_state<=s0;

change<=4'b0101;

item<=1;

end

end

else if(coin==4'b1010)

begin

if(sel==1)

begin

next\_state<=s0;

change<=4'b0101;

item<=1;

end

else

next\_state<=s0;

change<=4'b1010;

item<=1;

end

end

default:

next\_state<=s0;

endcase

end

endmodule