VGA

module clk\_div(

clk,clk\_d

);

//parameter div\_value =32'd10000;

parameter div\_value = 1;

input clk;

output clk\_d;

reg clk\_d;

reg count;

initial begin

clk\_d = 0;

count = 0;

end

always @ (posedge clk)

begin

if (count == div\_value)

begin

clk\_d <= ~clk\_d;

count <= 0;

end

else

count <= count + 1;

end

endmodule

module h\_counter(

clk,h\_count,trig\_v

);

input clk;

output[9:0] h\_count;

output trig\_v;

reg[9:0] h\_count;

reg trig\_v;

initial begin

h\_count <= 0;

trig\_v <= 0;

end

always @ (posedge clk)

begin

if (h\_count < 799)

begin

h\_count <= h\_count + 1;

trig\_v <= 1'b0;

end

else

begin

trig\_v <= 1'b1;

h\_count <= 0;

end

end

endmodule

module v\_counter(clk,enable\_v,v\_count);

input clk;

input enable\_v;

output[9:0] v\_count;

reg[9:0] v\_count;

initial begin

v\_count = 0;

end

always @( posedge clk )

begin

if (enable\_v & (v\_count < 524))

begin

v\_count <= v\_count + 1;

end

else if (enable\_v)

begin

v\_count <= 0;

end

end

endmodule

module vga\_sync(

input[9:0] h\_count,

input[9:0] v\_count,

output[9:0] x\_loc,

output [9:0] y\_loc,

output h\_sync,v\_sync,video\_on

);

//horizontal

localparam HD = 640;

localparam HF = 16;

localparam HB = 48;

localparam HR = 96;

//vertical

localparam VD = 480;

localparam VF = 10;

localparam VB = 33;

localparam VR = 2;

assign v\_sync = (v\_count < (VD+VF)) | (v\_count >= (VD+VF+VR));

assign h\_sync = (h\_count < (HD+HF)) | (h\_count >= (HD+HF+HR));

assign video\_on = (h\_count < HD) & (v\_count<VD);

assign x\_loc = h\_count;

assign y\_loc = v\_count;

endmodule

module final\_pixel\_gen(

input [3:0] flag,

input clk\_d,

input [9:0] pixel\_x,

input [9:0] pixel\_y,

input video\_on,

output reg [3:0] red = 0,

output reg [3:0] green = 0,

output reg [3:0] blue = 0

);

//end

//end

//always @(posedge clk\_d) begin

//title screen

//if (flag==1)

always @(flag)

begin

case (flag)

1:

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ((pixel\_x >= 64 & pixel\_x <=96 & pixel\_y>= 32 & pixel\_y <= 192) ||(pixel\_x >= 96 & pixel\_x <=160 & pixel\_y>= 160 & pixel\_y <= 192)|| (pixel\_x >= 192 & pixel\_x <=288 & pixel\_y>= 32 & pixel\_y <= 64) || (pixel\_x >= 192 & pixel\_x <=224 & pixel\_y>=64 & pixel\_y <= 192)|| (pixel\_x >= 224 & pixel\_x <= 256 & pixel\_y>=96 & pixel\_y <= 128)|| (pixel\_x >= 224 & pixel\_x <=288 & pixel\_y>= 160 & pixel\_y <= 192) || (pixel\_x >= 320 & pixel\_x <=416 & pixel\_y>= 32 & pixel\_y <= 64) ||(pixel\_x >= 352 & pixel\_x <= 384 & pixel\_y>= 64 & pixel\_y <= 192) || (pixel\_x >= 448 & pixel\_x <=480 & pixel\_y>= 32 & pixel\_y <= 96) || (pixel\_x >= 512 & pixel\_x <=608 & pixel\_y>= 32 & pixel\_y <= 64) || (pixel\_x >= 512 & pixel\_x <=544 & pixel\_y>= 64 & pixel\_y <= 128) || (pixel\_x >= 544 & pixel\_x <=608 & pixel\_y>= 96 & pixel\_y <= 128) || (pixel\_x >= 576 & pixel\_x <=608 & pixel\_y>= 128 & pixel\_y <= 192)|| (pixel\_x >= 512 & pixel\_x <=576 & pixel\_y>= 160 & pixel\_y <= 192)|| (pixel\_x >= 64 & pixel\_x <=96 & pixel\_y>= 256 & pixel\_y <= 416) || (pixel\_x >= 96 & pixel\_x <=160 & pixel\_y>= 256 & pixel\_y <= 288) || (pixel\_x >= 128 & pixel\_x <=160 & pixel\_y>= 288 & pixel\_y <= 320) || (pixel\_x >= 96 & pixel\_x <=160 & pixel\_y>= 320 & pixel\_y <= 352) || (pixel\_x >= 192 & pixel\_x <=224 & pixel\_y>= 256 & pixel\_y <= 416) || (pixel\_x >= 224 & pixel\_x <=288 & pixel\_y>= 384 & pixel\_y <= 416) || (pixel\_x >= 320 & pixel\_x <= 416 & pixel\_y>= 256 & pixel\_y <= 288) || (pixel\_x >= 320 & pixel\_x <=352 & pixel\_y>= 288 & pixel\_y <= 416) || (pixel\_x >= 384 & pixel\_x <=416 & pixel\_y>= 288 & pixel\_y <= 416) || (pixel\_x >= 352 & pixel\_x <=384 & pixel\_y>= 320 & pixel\_y <= 352) || (pixel\_x >= 448 & pixel\_x <=480 & pixel\_y>= 256 & pixel\_y <= 352) || (pixel\_x >= 480 & pixel\_x <=512 & pixel\_y>= 320 & pixel\_y <= 352) || (pixel\_x >= 512 & pixel\_x <=544 & pixel\_y>= 256 & pixel\_y <= 416) || (pixel\_x >= 448 & pixel\_x <=512 & pixel\_y>= 384 & pixel\_y <= 416))

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

// for Orange background

red <= video\_on ? 4'hA : 4'h0;

green <= video\_on ? 4'h1 : 4'h0;

blue <= video\_on ? 4'h6 : 4'h0;

end

end

end

2:

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ((pixel\_x >= 160 & pixel\_x <= 416 & pixel\_y >= 96 & pixel\_y<= 128)|| (pixel\_x >= 160 & pixel\_x <= 192 & pixel\_y >= 128 & pixel\_y<= 374)|| (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 128 & pixel\_y<= 374)|| (pixel\_x >= 192 & pixel\_x <= 384 & pixel\_y >= 342 & pixel\_y<= 374) || (pixel\_x >= 224 & pixel\_x <= 352 & pixel\_y >= 150 & pixel\_y<= 182)|| (pixel\_x >= 224 & pixel\_x <= 280 & pixel\_y >= 214 & pixel\_y<= 246)|| (pixel\_x >= 224 & pixel\_x <= 256 & pixel\_y >= 278 & pixel\_y<= 310) )

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

//for White color

if (((pixel\_x >= 192 & pixel\_x <= 384) & ((pixel\_y >=128 & pixel\_y<= 150) || (pixel\_y >= 182 & pixel\_y<= 214) || (pixel\_y >= 246 & pixel\_y <= 278) || (pixel\_y>= 310 & pixel\_y<= 342))) || (pixel\_y >= 128 & pixel\_y <= 342 & pixel\_x >=192 & pixel\_x<= 224)||(pixel\_y >= 128 & pixel\_y <= 342 & pixel\_x >= 352 & pixel\_x <=384) || (pixel\_x>=280 & pixel\_x <= 352 & pixel\_y >= 214 & pixel\_y <= 246) || (pixel\_x >=256 & pixel\_x <=352 & pixel\_y>= 278 & pixel\_y <=310))

begin

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'hF : 4'h0;

blue <= video\_on ? 4'hF : 4'h0;

end

else begin

// for Pink background

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'h9 : 4'h0;

blue <= video\_on ? 4'hF : 4'h0;

end

end

end

end

//else if (flag==3) //rock

3:

begin

//displays white border

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ((pixel\_x>=160 & pixel\_x<= 192 & pixel\_y >= 224 & pixel\_y <= 320) || (pixel\_x>= 192 & pixel\_x<= 224 & pixel\_y >= 192 & pixel\_y <= 256) || (pixel\_x>= 224 & pixel\_x<= 256 & pixel\_y >= 160 & pixel\_y <= 224) || (pixel\_x>= 256 & pixel\_x<= 288 & pixel\_y >= 160 & pixel\_y <= 192)|| (pixel\_x>= 288 & pixel\_x<= 320 & pixel\_y >= 160 & pixel\_y <= 224)|| (pixel\_x>= 320 & pixel\_x<= 384 & pixel\_y >= 192 & pixel\_y <= 224)|| (pixel\_x>= 352 & pixel\_x<= 384 & pixel\_y >= 224 & pixel\_y <= 256)|| (pixel\_x>= 384 & pixel\_x<= 416 & pixel\_y >= 224 & pixel\_y <= 320)|| (pixel\_x>= 160 & pixel\_x<= 416 & pixel\_y >= 288 & pixel\_y <= 320))

begin

red <= video\_on ? 4'h0 : 4'h0;

green <= video\_on ? 4'h0 : 4'h0;

blue <= video\_on ? 4'h0 : 4'h0;

end

else

begin

//for Gray color

if ((pixel\_x >= 256 & pixel\_x<= 288 & pixel\_y>=192 & pixel\_y<= 224) || (pixel\_x >= 224 & pixel\_x<= 352 & pixel\_y>=224 & pixel\_y<= 256) ||(pixel\_x >= 192 & pixel\_x<= 384 & pixel\_y>=256 & pixel\_y<= 288))

begin

red <= video\_on ? 4'h9 : 4'h0;

green <= video\_on ? 4'h9 : 4'h0;

blue <= video\_on ? 4'h9 : 4'h0;

end

else begin

// for Pink background

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'h9 : 4'h0;

blue <= video\_on ? 4'hF : 4'h0;

end

end

end

end

//else if (flag==4) //scissor

4:

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ((pixel\_x >= 96 & pixel\_x<= 192 & pixel\_y >= 128 & pixel\_y <=160) || (pixel\_x>= 160 & pixel\_x<= 256 & pixel\_y >= 160 & pixel\_y<=192) || (pixel\_x>= 96 & pixel\_x <= 128 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 96 & pixel\_x<= 192 & pixel\_y >= 192 & pixel\_y <=224) || (pixel\_x >= 224 & pixel\_x<= 480 & pixel\_y >= 192 & pixel\_y <=224)|| (pixel\_x >= 224 & pixel\_x<= 256 & pixel\_y >= 192 & pixel\_y <=320) || (pixel\_x >= 224 & pixel\_x<= 480 & pixel\_y >= 250 & pixel\_y <=288) || (pixel\_x >= 160 & pixel\_x<= 256 & pixel\_y >= 288 & pixel\_y <=320)||(pixel\_x >= 96 & pixel\_x<= 192 & pixel\_y >= 250 & pixel\_y <=288) || (pixel\_x >= 96 & pixel\_x<= 192 & pixel\_y >= 320 & pixel\_y <=352) || (pixel\_x >= 96 & pixel\_x<= 128 & pixel\_y >= 288 & pixel\_y <=320))

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

// for Pink background

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'h9 : 4'h0;

blue <= video\_on ? 4'hF : 4'h0;

end

end

end

//else if (flag== 5) //win

5:

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if((pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >= 32 & pixel\_y<= 128) || (pixel\_x >= 128 & pixel\_x <= 160 & pixel\_y >= 32 & pixel\_y<= 192) || (pixel\_x >= 96 & pixel\_x <= 128 & pixel\_y >= 96 & pixel\_y<= 128) || (pixel\_x >= 64 & pixel\_x <= 128 & pixel\_y >= 160 & pixel\_y<= 192) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 32 & pixel\_y<= 64) || (pixel\_x >= 192 & pixel\_x <= 224 & pixel\_y >= 64 & pixel\_y<= 192) || (pixel\_x >= 256 & pixel\_x <= 288 & pixel\_y >= 64 & pixel\_y<= 192) || (pixel\_x >= 224 & pixel\_x <= 256 & pixel\_y >= 160 & pixel\_y<= 192) || (pixel\_x >= 320 & pixel\_x <= 352 & pixel\_y >= 32 & pixel\_y<= 192)|| (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 32 & pixel\_y<= 192) || (pixel\_x >= 352 & pixel\_x <= 384 & pixel\_y >= 160 & pixel\_y<= 192) || (pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >= 256 & pixel\_y<= 448) || (pixel\_x >= 96 & pixel\_x <= 128 & pixel\_y >= 384 & pixel\_y<= 416) || (pixel\_x >= 128 & pixel\_x <= 160 & pixel\_y >= 352 & pixel\_y<= 384) || (pixel\_x >= 160 & pixel\_x <= 192 & pixel\_y >= 384 & pixel\_y<= 416) || (pixel\_x >= 256 & pixel\_x <= 352 & pixel\_y >= 256 & pixel\_y<= 288) || (pixel\_x >= 256 & pixel\_x <= 288 & pixel\_y >= 288 & pixel\_y<= 448) || (pixel\_x >= 320 & pixel\_x <= 352 & pixel\_y >= 288 & pixel\_y<= 448) || (pixel\_x >= 288 & pixel\_x <= 320 & pixel\_y >= 416 & pixel\_y<= 448) || (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 256 & pixel\_y<= 448) || (pixel\_x >= 512 & pixel\_x <= 544 & pixel\_y >= 256 & pixel\_y<= 448) || (pixel\_x >= 416 & pixel\_x <= 448 & pixel\_y >= 320 & pixel\_y<= 352) || (pixel\_x >= 448 & pixel\_x <= 480 & pixel\_y >= 352 & pixel\_y<= 384) || (pixel\_x >= 480 & pixel\_x <= 512 & pixel\_y >= 384 & pixel\_y<= 416) || (pixel\_x >= 192 & pixel\_x <= 224 & pixel\_y >=256 & pixel\_y <=448))

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

// for Yellow background

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'h7 : 4'h0;

blue <= video\_on ? 4'h8 : 4'h0;

end

end

end

//else if (flag ==6) //tie

6:

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ((pixel\_x >= 64 & pixel\_x <= 224 & pixel\_y >= 128 & pixel\_y <= 160) || (pixel\_x >= 128 & pixel\_x <= 160 & pixel\_y >= 160 & pixel\_y <= 320) || (pixel\_x >= 256 & pixel\_x <= 352 & pixel\_y >= 128 & pixel\_y <= 160) || (pixel\_x >= 256 & pixel\_x <= 352 & pixel\_y >= 288 & pixel\_y <= 320) || (pixel\_x >= 288 & pixel\_x <= 320 & pixel\_y >= 160 & pixel\_y <= 288)|| (pixel\_x >= 384 & pixel\_x <= 480 & pixel\_y >= 128 & pixel\_y <= 160)|| (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 160 & pixel\_y <= 288) || (pixel\_x >= 384 & pixel\_x <= 480 & pixel\_y >= 288 & pixel\_y <= 320) || (pixel\_x >= 416 & pixel\_x <= 448 & pixel\_y >= 224 & pixel\_y <= 256))

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

// for Golden background

red <= video\_on ? 4'h6 : 4'h0;

green <= video\_on ? 4'h6 : 4'h0;

blue <= video\_on ? 4'h0 : 4'h0;

end

end

end

//else if (flag==7) //lost

7:

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ( (pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >= 32 & pixel\_y <= 128) || (pixel\_x >= 128 & pixel\_x <= 160 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 96 & pixel\_x <= 128 & pixel\_y >= 96 & pixel\_y <= 128) || (pixel\_x >= 64 & pixel\_x <= 128 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 32 & pixel\_y <= 64) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 192 & pixel\_x <= 224 & pixel\_y >= 64 & pixel\_y <= 160) || (pixel\_x >= 256 & pixel\_x <= 288 & pixel\_y >= 64 & pixel\_y <= 160) || (pixel\_x >= 320 & pixel\_x <= 352 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 352 & pixel\_x <= 384 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >= 32 & pixel\_y <= 128) || (pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >= 32 & pixel\_y <= 128) || (pixel\_x >= 128 & pixel\_x <= 160 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 96 & pixel\_x <= 128 & pixel\_y >= 96 & pixel\_y <= 128) || (pixel\_x >= 64 & pixel\_x <= 128 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 32 & pixel\_y <= 64) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 192 & pixel\_x <= 224 & pixel\_y >= 64 & pixel\_y <= 160) || (pixel\_x >= 256 & pixel\_x <= 288 & pixel\_y >= 64 & pixel\_y <= 160) || (pixel\_x >= 320 & pixel\_x <= 352 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 352 & pixel\_x <= 384 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >=224 & pixel\_y <= 384) || (pixel\_x >= 64 & pixel\_x <= 96 & pixel\_y >= 32 & pixel\_y <= 128) || (pixel\_x >= 128 & pixel\_x <= 160 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 96 & pixel\_x <= 128 & pixel\_y >= 96 & pixel\_y <= 128) || (pixel\_x >= 64 & pixel\_x <= 128 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 32 & pixel\_y <= 64) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 192 & pixel\_x <= 224 & pixel\_y >= 64 & pixel\_y <= 160) || (pixel\_x >= 256 & pixel\_x <= 288 & pixel\_y >= 64 & pixel\_y <= 160) || (pixel\_x >= 320 & pixel\_x <= 352 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 32 & pixel\_y <= 192) || (pixel\_x >= 352 & pixel\_x <= 384 & pixel\_y >= 160 & pixel\_y <= 192) || (pixel\_x >= 96 & pixel\_x <= 128 & pixel\_y >= 352 & pixel\_y <= 384) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >= 352 & pixel\_y <= 384) || (pixel\_x >= 192 & pixel\_x <= 224 & pixel\_y >= 256 & pixel\_y <= 352) || (pixel\_x >= 256 & pixel\_x <= 288 & pixel\_y >= 256 & pixel\_y <= 352) || (pixel\_x >= 320 & pixel\_x <= 416 & pixel\_y >= 224 & pixel\_y <= 256) || (pixel\_x >= 320 & pixel\_x <= 352 & pixel\_y >= 256 & pixel\_y <= 320) || (pixel\_x >= 352 & pixel\_x <=416 & pixel\_y >= 288 & pixel\_y <= 320) || (pixel\_x >= 384 & pixel\_x <= 416 & pixel\_y >= 320 & pixel\_y <= 384)|| (pixel\_x >= 320 & pixel\_x <= 384 & pixel\_y >= 352 & pixel\_y <= 384) || (pixel\_x >= 448 & pixel\_x <= 544 & pixel\_y >= 224 & pixel\_y <= 256) || (pixel\_x >= 480 & pixel\_x <= 512 & pixel\_y >= 256 & pixel\_y <= 384) || (pixel\_x >= 192 & pixel\_x <= 288 & pixel\_y >=224 & pixel\_y <= 256))

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

// for Red background

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'h0 : 4'h0;

blue <= video\_on ? 4'h0 : 4'h0;

end

end

end

0: //Waiting Mark

begin

if ((pixel\_x==0) || (pixel\_x==639) || (pixel\_y==0) || (pixel\_y == 479))

begin

red <= 4'hF;

green <= 4'hF;

blue <= 4'hF;

end

else begin

//for black boundarioes

if ((pixel\_x>= 256 & pixel\_x <=384 & pixel\_y >=96 & pixel\_y<=128) || (pixel\_x >= 352 & pixel\_x <=384 & pixel\_y >=96 & pixel\_y<=256) || (pixel\_x >= 288 & pixel\_x <=320 & pixel\_y >=224 & pixel\_y<=256) || (pixel\_x >= 288 & pixel\_x <= 320 & pixel\_y >=256 & pixel\_y<=288) || (pixel\_x>= 288 & pixel\_x <= 320 & pixel\_y >= 320 & pixel\_y<= 352) )

begin

red <= video\_on ? 4'h0 : 4'hF;

green <= video\_on ? 4'h0 : 4'hF;

blue <= video\_on ? 4'h0 : 4'hF;

end

else

begin

// for Pink background

red <= video\_on ? 4'hF : 4'h0;

green <= video\_on ? 4'h9 : 4'h0;

blue <= video\_on ? 4'hF : 4'h0;

end

end

end

default:

begin

end

endcase

end

endmodule

**Main—-------------------**

module vga\_top(

input [3:0] states,

input clk,

output h\_sync,v\_sync,

output [3:0] red,green,blue

);

wire clk\_d, v\_trig, video\_on;

wire [9:0] h\_count;

wire[9:0] v\_count;

wire[9:0] x\_loc;

wire[9:0] y\_loc;

reg [3:0]Tflag;

clk\_div cd(clk,clk\_d);

h\_counter hc(clk\_d,h\_count,v\_trig);

v\_counter vc(clk\_d,v\_trig,v\_count);

vga\_sync vgas(h\_count,v\_count,x\_loc,y\_loc,h\_sync,v\_sync,video\_on);

// title\_pixel\_gen tt(Tflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

// paper\_pixel\_gen p(Pflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

// rock\_pixel\_gen r(Rflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

// sciss\_pixel\_gen s(Sflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

// win\_pixel\_gen w(Wflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

// tie\_pixel\_gen t(tflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

// lost\_pixel\_gen pg(Lflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

reg [24:0] count=0;

reg [1:0] helper;

initial helper=0;

always @ (posedge clk)

begin

if (states == 4'b0000)

begin

Tflag=1;

end

else

begin

//if (states= 4'b0001) looping waiting

if (states== 4'b0010) begin //paper

Tflag=2;

end

else

begin

if (states== 4'b0011) begin

Tflag= 3;

end

else

begin

if (states== 4'b0100)

begin

Tflag= 4;

end

else

begin

if (states== 4'b0101)

begin

Tflag=5;

end

else

begin

if (states== 4'b0110)

begin

Tflag=6;

end

else

begin

if (states== 4'b0111)

begin

Tflag= 7;

end

else

begin

//Looping

if (states== 4'b0001)

begin

Tflag= 0;

end

end

// end

end

end

end

end

end

end

end

final\_pixel\_gen tt(Tflag ,clk\_d,x\_loc,y\_loc,video\_on,red,green,blue);

endmodule