//====================================================================

// REG/WIRE declarations

//=====================================================================

wire draw\_square, draw\_circle, draw\_cross;

reg [19:0] num\_right, num\_left; // calculate the number of red dots and green dots;

reg obutton\_right, obutton\_left; // assign button

//===================================================================

// Structural coding

//===================================================================

assign draw\_square = ((x\_cnt>100) && (x\_cnt<150) && (y\_cnt>100) && (y\_cnt<150) ) ? 1'b1 : 1'b0;

assign draw\_cross = ((x\_cnt>600 && x\_cnt<700 && y\_cnt>150 && y\_cnt<450) || (x\_cnt>500 && x\_cnt<800 && y\_cnt>250 && y\_cnt<350)) ? 1'b1 : 1'b0;

assign draw\_circle = (x\_cnt-150)\*(x\_cnt-150)+(y\_cnt-240)\*(y\_cnt-240)<10000 ? 1'b1 : 1'b0;

//

always@(posedge iCLK or negedge iRST\_n)

begin

if (!iRST\_n)

begin

oHD <= 1'd0;

oVD <= 1'd0;

oDEN <= 1'd0;

oLCD\_R <= 8'd0;

oLCD\_G <= 8'd0;

oLCD\_B <= 8'd0;

end

else

begin

oHD <= mhd;

oVD <= mvd;

oDEN <= mden;

/\*

oLCD\_R <= obutton\_right && draw\_circle ? 8'hFF :read\_red; ////畫圓

oLCD\_G <= obutton\_left && draw\_cross ? 8'hFF :read\_green; //畫十字

oLCD\_B <= read\_blue;

\*/

oLCD\_R <= obutton\_right && draw\_circle ? 8'hFF :read\_red; ////畫圓

oLCD\_G <= obutton\_left && draw\_cross ? 8'hFF :read\_green; //畫十字

oLCD\_B <= read\_blue;

end

end

// ========================================================

// 加上變化

// 1. 紅色圓圈隨時間定時現/滅

// 2. 綠色十字隨時間改變顏色

// =====================================================

1. 宣告計時變數

reg [7:0] time\_count;

2. 時間計數

always@(posedge iCLK or negedge iRST\_n)

begin

if (!iRST\_n)

y\_cnt <= 10'd0;

else if (x\_cnt == (H\_LINE-1))

begin

if (y\_cnt == (V\_LINE-1))

y\_cnt <= 10'd0;

else

y\_cnt <= y\_cnt + 10'd1;

end

end

always@(posedge iCLK or negedge iRST\_n)

begin

if (!iRST\_n)

time\_count <= 8'd0;

else if (y\_cnt == (V\_LINE-1) && x\_cnt==(H\_LINE-1))

time\_count <= time\_count+1;

end

3. 隨時間改變

assign draw\_circle = ((x\_cnt-150)\*(x\_cnt-150)+(y\_cnt-240)\*(y\_cnt-240)<10000) && (time\_count<128)

? 1'b1 : 1'b0;

oLCD\_R <= draw\_circle? 8'd255 : draw\_cross ? y\_cnt : draw\_square ? 8'd255 : read\_red;

oLCD\_G <= draw\_circle? 8'd0 : draw\_cross ? time\_count : draw\_square ? 8'd0 : read\_green;

oLCD\_B <= draw\_circle? 8'd0 : draw\_cross ? x\_cnt : draw\_square ? 8'd0 : read\_blue;