`define SCREEN\_WIDTH 176

`define SCREEN\_HEIGHT 144

`define NUM\_BARS 3

`define BAR\_HEIGHT 48

module IMAGE\_PROCESSOR (

PIXEL\_IN,

CLK,

VGA\_PIXEL\_X,

VGA\_PIXEL\_Y,

VGA\_VSYNC\_NEG,

RESULT,

HREF

);

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

// PORT declarations

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

input [7:0] PIXEL\_IN;

input CLK;

input [9:0] VGA\_PIXEL\_X;

input [9:0] VGA\_PIXEL\_Y;

input VGA\_VSYNC\_NEG;

output reg [2:0] RESULT; // was 9 bits

input HREF;

reg [15:0] countBlue;

reg [15:0] countRed;

reg [15:0] countNull;

reg [15:0] red\_threshold = 16'd20000;

reg [15:0] blue\_threshold = 16'd20000;

reg lastsync = 1'b0;

always @(posedge CLK) begin

if (HREF) begin

if (PIXEL\_IN == 8'b0) begin

countBlue = countBlue + 16'd1;

end else if (PIXEL\_IN[7:5] > 3'b010) begin

countRed = countRed + 3'b111;

end else begin

countNull = countNull + 16'd1;

end

end

if (VGA\_VSYNC\_NEG == 1'b1 && lastsync == 1'b0) begin

if (countBlue > blue\_threshold) begin

RESULT = 3'b111;

end else if (countRed > red\_threshold) begin

RESULT = 3'b110;

end else begin

RESULT = 3'b000;

end

end

if (VGA\_VSYNC\_NEG == 1'b0 && lastsync == 1'b1) begin

countBlue = 16'b0;

countRed = 16'b0;

countNull = 16'b0;

end

lastsync = VGA\_VSYNC\_NEG;

end

endmodule