`timescale 1ns / 1ps

//////////////////////////////////////////////////////////////////////////////////

// Company:

// Engineer:

//

// Create Date: 2019/07/04 23:48:58

// Design Name:

// Module Name: LED\_flow

// Project Name:

// Target Devices:

// Tool Versions:

// Description:

//

// Dependencies:

//

// Revision:

// Revision 0.01 - File Created

// Additional Comments:

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//////////////////////////////////////////////////////////////////////////////////

module LED\_flow(

input i\_clk, // 时钟信号输入，100MHZ

input i\_rst\_n, // 复位信号

input pause, // 暂停信号

output reg [6:0] keyboard\_val, // 七段显示器

output reg [7:0] keyboard // 七段显示器使能信号

);

reg [28:0] cnt2; // 计数子用来构造1HZ的脉冲信号

reg [3:0] flag; // 用来判断此时刷新显示哪一个

reg [23:0] flag\_time; // 用来记录跑秒

reg key\_clk\_sec; //1HZ的脉冲信号

reg [17:0] cnt; // 计数子

always @ (posedge i\_clk)

begin

cnt <= cnt + 1'b1;

cnt2 <= (cnt2 + 1'b1) % 28'd1000000;

if(cnt2 < 28'd500000)

key\_clk\_sec <= 1'b1;

else

key\_clk\_sec <= 1'b0;

end

wire key\_clk = cnt[17]; //构造频率为〖10〗^8 / 2^18 =381.470 HZ脉冲信号

always @ (posedge key\_clk\_sec)

begin

if(!pause && !i\_rst\_n)

flag\_time <= (flag\_time + 1'b1) % 24'd8640000;

else if(i\_rst\_n) //复位信号到来，时间置0

flag\_time <= 24'b0;

end

always @ (posedge key\_clk)

begin

flag <= (flag + 1'b1) % 4'd8;

case(flag)

4'h0:begin

keyboard <= 8'b0111\_1111; //刷新第1个七段显示

case((flag\_time / 19'd360000) / 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h1:begin

keyboard <= 8'b1011\_1111; //刷新第2个七段显示

case((flag\_time / 19'd360000) % 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h2:begin

keyboard <= 8'b1101\_1111; //刷新第3个七段显示

case(((flag\_time / 13'd6000) % 6'd60) / 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h3:begin

keyboard <= 8'b1110\_1111; //刷新第4个七段显示

case(((flag\_time / 13'd6000) % 6'd60) % 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h4:begin

keyboard <= 8'b1111\_0111; //刷新第5个七段显示

case(((flag\_time / 7'd100) % 6'd60) / 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h5:begin

keyboard <= 8'b1111\_1011; //刷新第6个七段显示

case(((flag\_time / 7'd100) % 6'd60) % 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h6:begin

keyboard <= 8'b1111\_1101; //刷新第7个七段显示

case((flag\_time % 7'd100)/4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

4'h7:begin

keyboard <= 8'b1111\_1110; //刷新第8个七段显示

case(flag\_time % 4'd10)

4'd0:keyboard\_val <= 7'b0000001; //显示0

4'd1:keyboard\_val <= 7'b1001111; //显示1

4'd2:keyboard\_val <= 7'b0010010; //显示2

4'd3:keyboard\_val <= 7'b0000110; //显示3

4'd4:keyboard\_val <= 7'b1001100; //显示4

4'd5:keyboard\_val <= 7'b0100100; //显示5

4'd6:keyboard\_val <= 7'b0100000; //显示6

4'd7:keyboard\_val <= 7'b0001111; //显示7

4'd8:keyboard\_val <= 7'b0000000; //显示8

4'd9:keyboard\_val <= 7'b0001100; //显示9

endcase

end

endcase

end

endmodule