課題17-5

コード

TopModule.v

```
module TopModule(
    ////////////// CLOCK //////////
    input                       CLK1,
    input                       CLK2,
    ////////////// SEG7 //////////
    output          [7:0]       HEX0,
    output          [7:0]       HEX1,
    output          [7:0]       HEX2,
    output          [7:0]       HEX3,
    output          [7:0]       HEX4,
    output          [7:0]       HEX5,
    ////////////// Push Button //////////
    input           [1:0]       BTN,
    ////////////// LED //////////
    output          [9:0]       LED,
    ////////////// SW //////////
    input           [9:0]       SW

    );
    wire clk, res, wnq;
    wire [3:0] wq;
    wire [7:0] hex;

    m_rs_flipflop u1(BTN[0], BTN[1], clk, wnq); //clock

    assign res = SW[0];         //reset

    m_counter(clk, res, wq);    //counter

    m_seven_segment u2(wq, hex);

    assign LED={6'h0,wq};
    assign HEX0=hex;
    assign HEX1=8'hff;
    assign HEX2=8'hff;
    assign HEX3=8'hff;
    assign HEX4=8'hff;
    assign HEX5=8'hff;

endmodule
```

Counter.v

```
module m_rs_flipflop(input set,input reset,output q,output nq);
    assign q=~(set & nq);
    assign nq=~(reset & q);
endmodule


module m_counter( ck, res, q );
    input   ck, res;
    output  [3:0] q;
    reg     [3:0] q;

    always @( posedge ck or posedge res )
    begin
        if( res == 1'b1 )
            q <= 4'h0;
        else
            q <= q + 4'h1 ;
    end
endmodule
```

SevenSegment.v

```
module m_seven_segment(input [3:0] idat,output [7:0] odat);

    function [7:0] LedHex;
      input [3:0] num;
      begin
         case (num)
           4'h0:        LedHex = 8'b11000000;  // 0
           4'h1:        LedHex = 8'b11111001;  // 1
           4'h2:        LedHex = 8'b10100100;  // 2
           4'h3:        LedHex = 8'b10110000;  // 3
           4'h4:        LedHex = 8'b10011001;  // 4
           4'h5:        LedHex = 8'b10010010;  // 5
           4'h6:        LedHex = 8'b10000010;  // 6
           4'h7:        LedHex = 8'b11111000;  // 7
           4'h8:        LedHex = 8'b10000000;  // 8
           4'h9:        LedHex = 8'b10011000;  // 9
              4'ha:        LedHex = 8'b10001000;  // A
              4'hb:        LedHex = 8'b10000011;  // b
              4'hc:        LedHex = 8'b11000110;  // C
              4'hd:        LedHex = 8'b10100001;  // d
              4'he:        LedHex = 8'b10000110;  // E
              4'hf:        LedHex = 8'b10001110;  // F
           default:     LedHex = 8'b11111111;  // LED OFF
         endcase
      end
    endfunction

    assign odat = LedHex(idat);
```

```
endmodule
```

動作確認

- ボタンを押すとカウントが進み、HEX0に16進数が表示された
- SW0をあげるとリセットされた