課題 16-3

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 [7:0] input_0, input_1, output_0, output_1;
    wire [3:0] sum;
    wire co;

    m_seven_segment u0(SW[3:0], input_0);
    m_seven_segment u1(SW[7:4], input_1);

    add4 u2(SW[3:0], SW[7:4], 1'b0, sum, co);

    m_seven_segment u3(sum, output_0);
    m_seven_segment u4(co, output_1);

    assign LED={6'h0,SW[7:0]};
    assign HEX0=output_0;
    assign HEX1=output_1;
    assign HEX2=input_0;
    assign HEX3=input_1;
    assign HEX4=8'hff;
    assign HEX5=8'hff;

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

module add4(input  [3:0] a, b,
            input        ci,
            output [3:0] sum,
            output       co);

  assign {co, sum} = a + b + ci;
endmodule
```

動作確認

- スイッチと対応する16進数がHEX2,3に表示された
- 足し算の結果がHEX0,1に表示された