

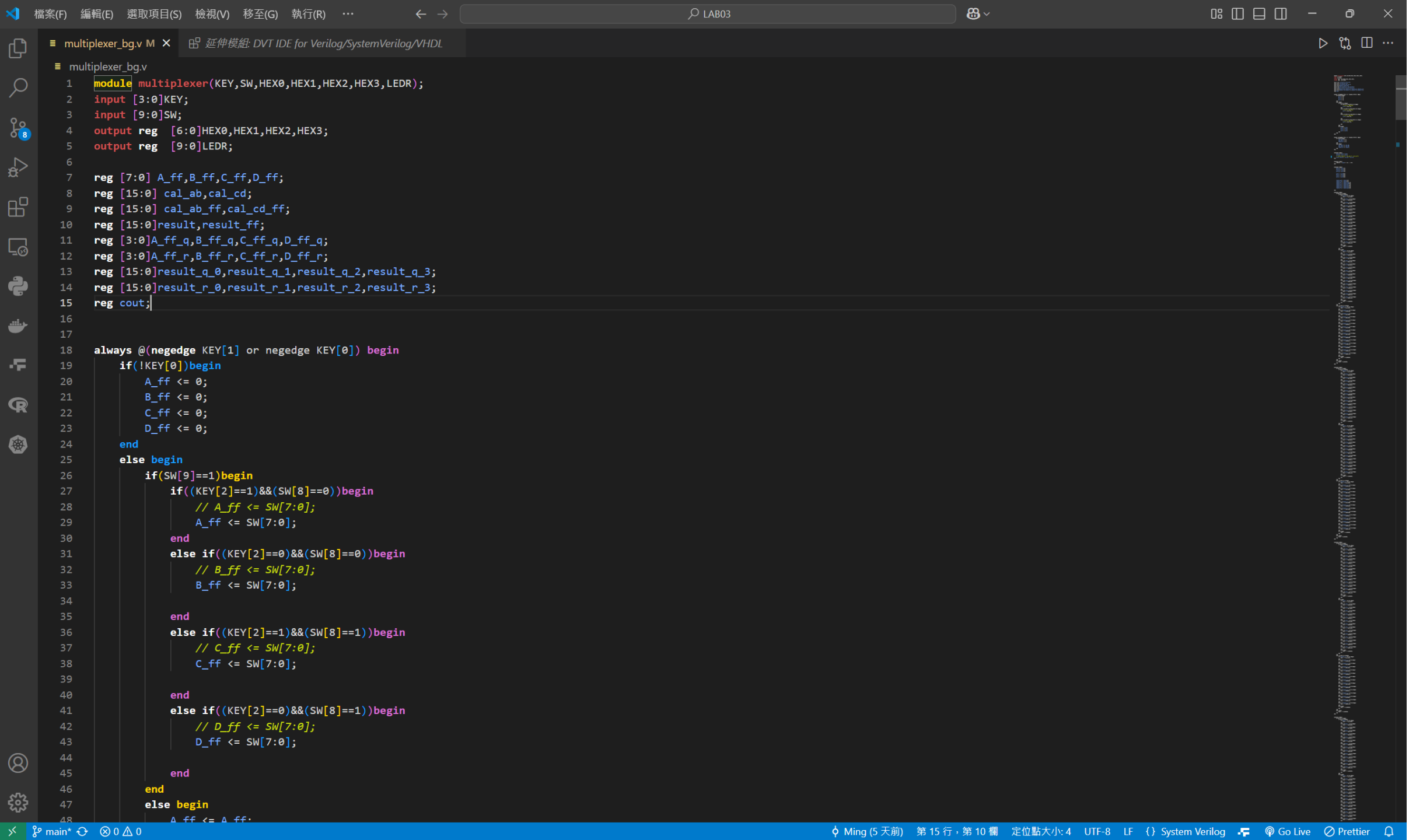
LAB03_312651057

吳鴻明

實驗目的

16 bits 四則運算計算機功能包含:檢測是否溢位、結果顯示、4個變數的
分別顯示以及設定。

實驗程式碼



≡ multiplexer_bg.v

```
25     else begin
```

46		end
----	--	------------

```
48 A_ff <= A_ff;
```

```
50 C_ff <= C_ff;
```

```
52 | end
```

54 end

```
58     if(!KEY[0])begin
```

```
60 cal_cd_ff <= 0;
```

```
64      cal_ab_ff <= cal_ab;
```

```
66         result_ff <= result;
```

```
68      end
69  
```

70
71

```
72     cal_ab = A_ff * B_ff;
73     cal_ad = C_ff * D_ff;
```

```
74 // {cout,result} = cal_ab_ff + cal_cd_ff;
75 {cout,result} = cal_ab + cal_cd;
```

```

76      end
77

```

79 alw

```
80 LEDR[9] = (cout) ? 1 : 0;
81 end
```

```
85 |         A_ff_q ≡ A_ff/16:
```

```
87 C_ff_q = C_ff/16;
```

89 $\mathcal{B}_{-n-q} = \mathcal{B}_{-n, \pm 0},$

```
90 A f f r = A f f % 16:
```

main* 0 0

```
84  always@(*)begin
```

```

97      result_r_0 = result%16;
98      result_q_1 = result_q_0/16;
99      result_r_1 = result_q_0%16;
100     result_q_2 = result_q_1/16;
101     result_r_2 = result_q_1%16;
102     result_q_3 = result_q_2/16;
103     result_r_3 = result_q_2%16;

```

105 end

```
107  always@(*)begin
```

```

108     if(KEY[3]==1)begin
109         if(SW[8]==0)begin
110             if((A_ff_q ==8'd1))begin
111                 HEX3 = 7'b1111001;
112             end
113             else if(A_ff_q ==8'd2)begin
114                 HEX3 = 7'b0100100;
115             end
116             else if(A_ff_q ==8'd3)begin
117                 HEX3 = 7'b0110000;
118             end
119             else if(A_ff_q ==8'd4)begin
120                 HEX3 = 7'b0011001;
121             end
122             else if(A_ff_q ==8'd5)begin
123                 HEX3 = 7'b0010010;
124             end
125             else if(A_ff_q ==8'd6)begin
126                 HEX3 = 7'b0000011;
127             end
128             else if(A_ff_q ==8'd7)begin
129                 HEX3 = 7'b1011000;
130             end
131             else if(A_ff_q ==8'd8)begin
132                 HEX3 = 7'b0000000;
133             end
134             else if(A_ff_q ==8'd9)begin
135                 HEX3 = 7'b0011000;
136             end
137             else if(A_ff_q ==8'd10)begin
138                 HEX3 = 7'b0001000;
139             end
140             else if(A_ff_q ==8'd11)begin
141                 HEX3 = 7'b0000011;
142             end

```

問題與討論

問題：在實作中，遇到計算結果delay一個cycle才顯示在7段顯示器，以及一些多工器的問題與Latch的問題。

討論：透過撰寫testbench檢察功能是否正常，最後在waveform中看到問題，並回到code裡，修改。