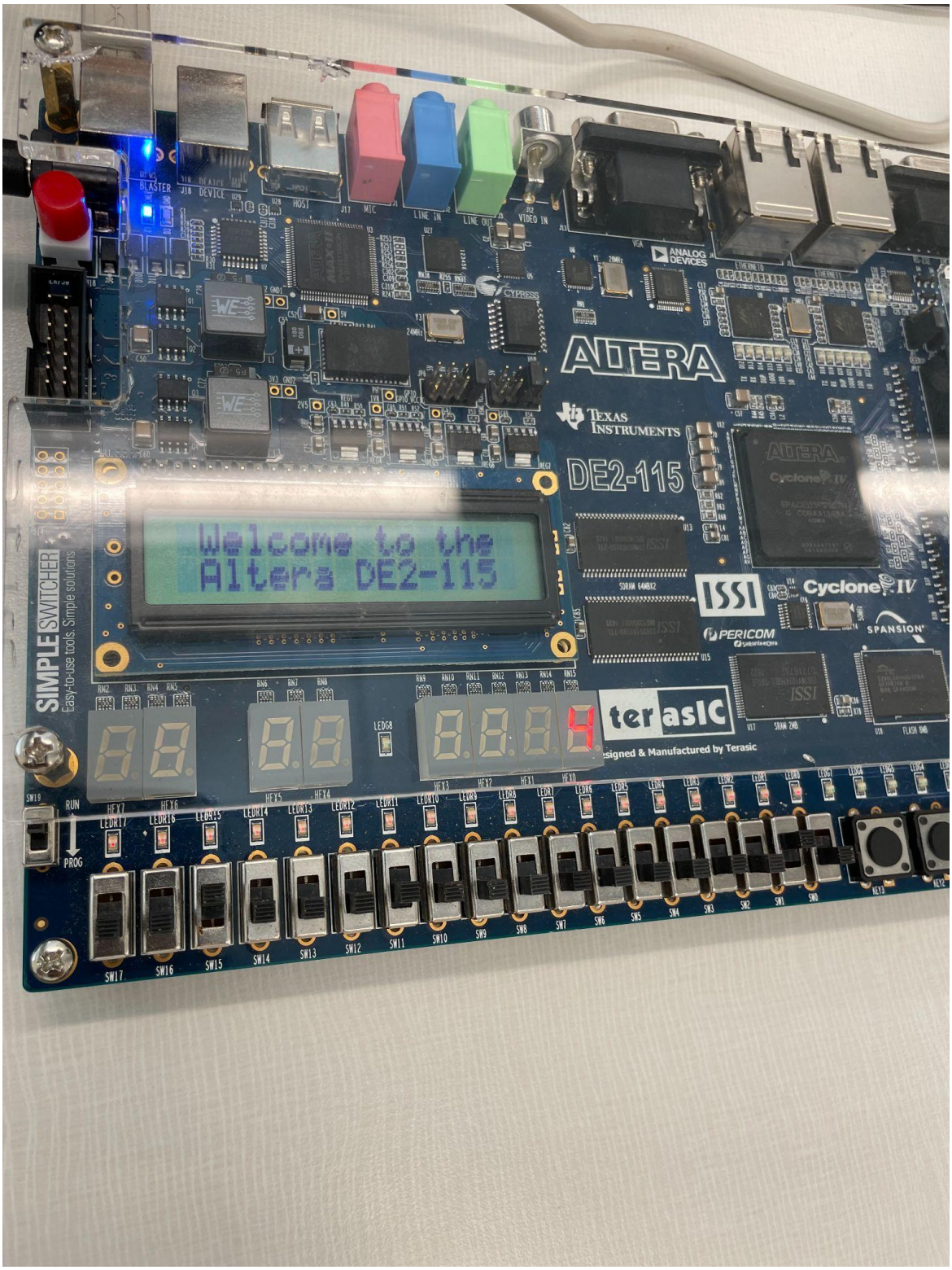
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```
38
39  module FullAdder(
40      input x,
41      input y,
42      input z,
43      output s,
44      output c);
45
46      wire w1, w2, w3;
47
48      HalfAdder half_adder_1(x, y, w1, w2);
49      HalfAdder half_adder_2(w1, z, s, w3);
50      or G1(c, w2, w3);
51
52  endmodule
53
54  module Adder4BitStructural(
55      input[3:0] a,
56      input[3:0] b,
57      output[3:0] s);
58
59      wire[4:0] c;
60
61      FullAdder full_adder_0(a[0], b[0], c_in, s[0], c[1]);
62      FullAdder full_adder_1(a[1], b[1], c[1], s[1], c[2]);
63      FullAdder full_adder_2(a[2], b[2], c[2], s[2], c_out);
64      FullAdder full_adder_3(a[3], b[3], c[3], s[3], c[4]);
65
66  endmodule
67
```

calculator.v

```
1  module sevensegmentdecoder(input[3:0] x, output reg[6:0] segments);
2     always @(x)
3        case (x)
4           0: segments = 7'b1000000;
5           1: segments = 7'b1111001;
6           2: segments = 7'b0100100;
7           3: segments = 7'b0110000;
8           4: segments = 7'b0011001;
9           5: segments = 7'b0010010;
10          6: segments = 7'b0100000;
11          7: segments = 7'b1111000;
12          8: segments = 7'b0000000;
13          9: segments = 7'b0010000;
14
15          default: segments = 7'bxxxxxxx;
16       endcase
17
18 endmodule
19
20 module calculator(input[3:0] a, input[3:0] b, output[6:0] segments);
21    wire[3:0] s;
22
23    Adder4BitStructural adder(a,b,s);
24    sevensegmentdecoder decoder(s, segments);
25
26 endmodule
27
28 module HalfAdder(
29    input x,
30    input y,
31    output s,
32    output c);
33
34    xor G1(s, x, y);
35    and G2(c, x, y);
36
37 endmodule
38
39 module FullAdder(
40    input x,
```