```
1   `timescale 1ns / 1ns // `timescale time_unit/time_precision
2
3
4   /* top-level entity for 7 to 1 multiplexer */
5   module lab3Part1 (input [9:0] SW, output [0:0] LEDR);
6
7               /*
8                * SW[6:0] are the data inputs
9                * SW[9:7] are the select signals
10               * LEDR[0] is the output
11               */
12
13              mux7to1 C1 (.Input(SW[6:0]), .MuxSelect(SW[9:7]), .Out(LEDR[0]));
14
15  endmodule // lab3Part1
16
17
18  /* 7 to 1 multiplexer module */
19  module mux7to1 (input [6:0] Input, input [2:0] MuxSelect, output Out);
20
21              reg muxOut; // output of the always block
22
23              /*
24               * always statement implementing the
25               * the combinational logic for selecting signals
26               */
27
28              always @(*)
29              begin
30                 case (MuxSelect[2:0])
31
32                     3'b000: muxOut = Input[0]; // input signal 1
33                     3'b001: muxOut = Input[1]; // input signal 2
34                     3'b010: muxOut = Input[2]; // input signal 3
35                     3'b011: muxOut = Input[3]; // input signal 4
36                     3'b100: muxOut = Input[4]; // input signal 5
37                     3'b101: muxOut = Input[5]; // input signal 6
38                     3'b110: muxOut = Input[6]; // input signal 7
39                     default: muxOut = 1'b0; // default case
40
41                 endcase
42              end
43
44              assign Out = muxOut;
45
46  endmodule // mux7to1
```