```
1   `timescale 1ns / 1ps
2   //////////////////////////////////////////////////////////////////////////////////
3   // Company:
4   // Engineer:
5   //
6   // Create Date:    12:54:44 02/27/12
7   // Design Name:
8   // Module Name:    piggy
9   // Project Name:
10  // Target Device:
11  // Tool versions:
12  // Description:
13  //
14  // Dependencies:
15  //
16  // Revision:
17  // Revision 0.01 - File Created
18  // Additional Comments:
19  //
20  //////////////////////////////////////////////////////////////////////////////////
21  module piggy(clk, reset, b1_in, b5_in, b10_in, segment1, segment0, full_led);
22
23      input clk, reset;
24      input b1_in, b5_in, b10_in;
25      output [6:0]segment1;
26      output [6:0]segment0;
27      output full_led;
28      reg [6:0]segment1;
29      reg [6:0]segment0;
30      reg full_led;
31      reg [3:0]n;
32      reg [3:0]s;
33      reg [3:0]nn;
34      reg [3:0]ns;
35
36  // Add code here
37
38  always @ (posedge clk)
39     if (reset)
40        begin
41           s<=#1 0;
42           n<=#1 0;
43        end
44     else
45        begin
46           s<=#1 ns;
47           n<=#1 nn;
48        end
49
50  always @ (n or s or b1_in or b5_in or b10_in)
51     begin
52        case({b10_in, b5_in, b1_in})
53           3'b000:  begin
54                       nn=n;
55                       ns=s;
56                    end
57           3'b001:  if (n<9)
58                       begin
59                          nn=n+1;
60                          ns=s;
61                       end
62                    else if ((n==9) && (s==9))
63                       begin
64                          nn=n;
65                          ns=s;
66                          full_led = 1;
67                       end
68                    else
```

```
69                      begin
70                         nn=0;
71                         ns=s+1;
72                      end
73            3'b010:   if (n<5)
74                      begin
75                         nn=n+5;
76                         ns=s;
77                      end
78                    else if ((s==9) && (n>4))
79                      begin
80                         nn=9;
81                         ns=9;
82                         full_led = 1;
83                      end
84                    else
85                      begin
86                         nn=n-5;
87                         ns=s+1;
88                      end
89
90            3'b011:   if (n<5)
91                      begin
92                         nn=n+5;
93                         ns=s;
94                      end
95                    else if ((s==9) && (n>4))
96                      begin
97                         nn=9;
98                         ns=9;
99                         full_led = 1;
100                     end
101                   else
102                     begin
103                        nn=n-5;
104                        ns=s+1;
105                     end
106           3'b100:   if (s==9)
107                     begin
108                        nn=9;
109                        ns=9;
110                        full_led = 1;
111                     end
112                   else
113                     begin
114                        nn=n;
115                        ns=s+1;
116                     end
117           3'b101:   if (s==9)
118                     begin
119                        nn=9;
120                        ns=9;
121                        full_led = 1;
122                     end
123                   else
124                     begin
125                        nn=n;
126                        ns=s+1;
127                     end
128           3'b110:   if (s==9)
129                     begin
130                        nn=9;
131                        ns=9;
132                        full_led = 1;
133                     end
134                   else
135                     begin
136                        nn=n;
```

```
137                         ns=s+1;
138                      end
139            3'b111:  if (s==9)
140                      begin
141                         nn=9;
142                         ns=9;
143                         full_led = 1;
144                      end
145                   else
146                      begin
147                         nn=n;
148                         ns=s+1;
149                      end
150         endcase
151      end
152
153   always @ (n or s)
154      if ((n==9) && (s==9))
155         full_led = 1;
156      else
157         full_led = 0;
158
159   always @ (n)
160      case (n)
161         0: segment0 = 7'b1111110;
162         1: segment0 = 7'b0110000;
163         2: segment0 = 7'b1101101;
164         3: segment0 = 7'b1111001;
165         4: segment0 = 7'b0110011;
166         5: segment0 = 7'b1011011;
167         6: segment0 = 7'b0011111;
168         7: segment0 = 7'b1110000;
169         8: segment0 = 7'b1111111;
170         9: segment0 = 7'b1111011;
171         default: segment0 = 7'bx;
172      endcase
173
174   always @ (s)
175      case (s)
176         0: segment1 = 7'b1111110;
177         1: segment1 = 7'b0110000;
178         2: segment1 = 7'b1101101;
179         3: segment1 = 7'b1111001;
180         4: segment1 = 7'b0110011;
181         5: segment1 = 7'b1011011;
182         6: segment1 = 7'b0011111;
183         7: segment1 = 7'b1110000;
184         8: segment1 = 7'b1111111;
185         9: segment1 = 7'b1111011;
186         default: segment1 = 7'bx;
187      endcase
188
189   endmodule
190
```