

```
1  module controle(  
2      input  reset,clock,dv,  
3      output reg selA,wrA,wrB,  
4      output reg [1:0]aluOp,  
5      output reg [2:0] prStateLed,nxStateLed  
6  );  
7      //estados  
8      parameter idle = 3'h0,  
9              load = 3'h1,  
10             displayB = 3'h2,  
11             storeQ = 3'h3,  
12             storeR = 3'h4;  
13  
14      reg [2:0] PrState,NxState;  
15  
16      //reg selA, wrA, wrB;  
17      //reg aluOp;  
18  
19      //bloco sequencial  
20      always @(posedge reset or posedge clock) begin  
21          if(reset) begin  
22              PrState <= idle;  
23          end  
24          else begin  
25              PrState <= NxState;  
26          end  
27      end  
28  
29      //bloco combinacional  
30      always @(*) begin  
31          case (PrState)  
32              idle: begin  
33                  selA = 1'b0;  
34                  wrA = 1'b0;  
35                  wrB = 1'b0;  
36                  aluOp = 2'b00;  
37  
38                  if (dv == 1) begin  
39                      NxState = load;  
40                  end else begin  
41                      NxState = idle;  
42                  end  
43              end  
44              load: begin  
45                  selA = 1'b1;  
46                  wrA = 1'b1;  
47                  wrB = 1'b1;  
48                  aluOp = 2'b00;  
49  
50                  if (dv == 1) begin  
51                      NxState = displayB;  
52                  end else begin  
53                      NxState = load;  
54                  end  
55              end  
56              displayB: begin  
57                  selA = 1'b0;  
58                  wrA = 1'b0;  
59                  wrB = 1'b0;  
60                  aluOp = 2'b01;  
61  
62                  if (dv == 1) begin  
63                      NxState = storeQ;  
64                  end else begin  
65                      NxState = displayB;  
66                  end  
67              end  
68              storeQ: begin  
69                  selA = 1'b0;  
70                  wrA = 1'b0;  
71                  wrB = 1'b0;  
72                  aluOp = 2'b10;  
73  
74                  if (dv == 1) begin  
75                      NxState = storeR;  
76                  end else begin  
77                      NxState = storeQ;  
78                  end  
79              end  
80              storeR: begin  
81                  selA = 1'b0;
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```
82         wrA = 1'b0;
83         wrB = 1'b0;
84         aluOp = 2'b11;
85
86         if (dv == 1) begin
87             NxState = idle;
88         end else begin
89             NxState = storeR;
90         end
91     end
92     default: begin
93         NxState = idle;
94         selA = 1'b0;
95         wrA = 1'b0;
96         wrB = 1'b0;
97         aluOp = 2'b00;
98     end
99 endcase
100
101     prStateLed = PrState;
102     nxStateLed = NxState;
103 end
104 endmodule
```