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/*
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   3/7/24
   EE 371
   Lab 6, Task 2

   This module takes in the car prescence inputs and
   outputs a 7 bit value for the HEX displays to show
   the available spots.
*/

module lot_spots (
   input logic [1:0] cars, //amount of cars in lots
   output logic [6:0] hx0, //hex0 value
   output logic [6:0] hx1, //hex1 value
   output logic [6:0] hx2, //hex2 value
   output logic [6:0] hx3  //hex3 value
);

   //uses an always comb value to have the hexes
   //show the available amount of spots left
   //goes from 3-1, and displays "FULL" if
   //0 spots are left
   always_comb begin
      case(cars)
         2'b00: begin
                  hx0 <= 7'b0110000;
                  hx1 <= 7'b1111111;
                  hx2 <= 7'b1111111;
                  hx3 <= 7'b1111111;
                end
         2'b01: begin
                  hx0 <= 7'b0100100;
                  hx1 <= 7'b1111111;
                  hx2 <= 7'b1111111;
                  hx3 <= 7'b1111111;
                end
         2'b10: begin
                  hx0 <= 7'b1111001;
                  hx1 <= 7'b1111111;
                  hx2 <= 7'b1111111;
                  hx3 <= 7'b1111111;
                end
         2'b11: begin
                  hx0 <= 7'b1000111;
                  hx1 <= 7'b1000111;
                  hx2 <= 7'b1000001;
                  hx3 <= 7'b0001110;
                end
      endcase
   end
endmodule
//testbench
module lot_spots_tb();
   //logic variables
   logic [1:0] cars;
   logic [6:0] hx0, hx1, hx2, hx3;

   lot_spots dut(.*);

   //tests a case where the lot fills up one car at a time
   initial begin
      cars <= 2'b00; #5;
      cars <= 2'b01; #5;
      cars <= 2'b10; #5;
      cars <= 2'b11; #5;
      $stop;
   end
endmodule
```