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1   /*-------------------------------------------------------------------------------
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3   CLass: EE417 Summer 2024
4   Lesson 06 HW Question 2
5   Group: Ron Kalin/ Lamin Jammeh
6   Project Description: This is the main module, it detects a comma symbol 4b'1101 once
7   the symbol is detect the index of the MSB of the symbol and send it as an output
8   -------------------------------------------------------------------------------*/
9   module comma_1101_search #(parameter word_size = 32,
10                             index_size = 4)
11                  (output  reg [index_size:0]   index_out,     //4 bits index
    [4:0]=16+8+4+2+1=31, possible index_out = 0:31
12                  input    [word_size - 1:0]    word_in,       //32 bits input [31:0]
13                  input                         trigger);      //triggers the count
14                  reg [word_size - 1:0]   temp_reg;            //Temporary register to locate
    the comma code
15
16  always @ (posedge trigger)
17            begin: search_code
18               temp_reg = word_in;                        //copying the result into the
    temporary register
19               for (index_out = 3;  index_out < (word_size);   index_out = (index_out + 1))
20                  begin
21                     if (temp_reg[3:0] == 4'b1101) disable search_code; //always check the 3LSBs
22                     else begin
23                              temp_reg = temp_reg >> 1;                    //shift the
    temp_reg to the right
24                              if ((temp_reg == 0) | (index_out == (word_size - 1)))    //the
    temp_reg is all 0s
25                                      begin
26                                      index_out = 4'b0000;
27                                      disable search_code;
28                                      end
29                              end
30                     end
31            end
32  endmodule
```