```
1   `timescale 1ns / 1ps
2   /**********************************************************************************
3    *
4    * Author:   Jesus Luciano
5    * Filename: DIV_32.v
6    * Date:     1/22/2019
7    * Version:  1.0
8    *
9    * Notes:    ALU module that outputs the quotient and remainder of its two
10   *           inputs as 2 32 bit outputs
11   *
12   **********************************************************************************/
13
14  module DIV_32(S, T, Y_hi, Y_lo);
15
16       //delcare inputs and outputs
17       input      [31:0]  S, T;
18       output reg [31:0] Y_hi, Y_lo;
19
20       //delacre integers
21       integer int_S, int_T;
22
23       always @(*) begin
24          //cast inputs as integers to allow for division calculation
25          int_S = S;
26          int_T = T;
27          //high 32 bits are set to remainder
28          Y_hi = int_S % int_T;
29          //low  32 bits are set to quotient
30          Y_lo = int_S / int_T;
31       end
32
33  endmodule
```