`timescale 1ns / 1ps

//////////////////////////////////////////////////////////////////////////

/\*

Question 2

Find max of 4 32-bit unsigned numbers by subtracting 33-bit signed numbers and finding sign bit.

\*/

//////////////////////////////////////////////////////////////////////////

module C\_4\_32(

input [31:0] a,

input [31:0] b,

input [31:0] c,

input [31:0] d,

output reg [31:0] max

);

reg [32:0] as, bs, cs, ds;

reg [32:0] bsc, dsc;

reg [32:0] cmpab;

reg [31:0] maxab;

reg [32:0] cmpcd;

reg [31:0] maxcd;

reg [32:0] maxabs, maxcds, maxcdc;

reg [32:0] cmp\_ab\_cd;

always @(\*) begin

as = {1'b0, a};

bs = {1'b0, b};

cs = {1'b0, c};

ds = {1'b0, d};

bsc = (~bs) + 33'd1;

dsc = (~ds) + 33'd1;

cmpab = as + bsc;

if(cmpab[32]) begin

maxab = b;

end

else begin

maxab = a;

end

cmpcd = cs + dsc;

if(cmpcd[32]) begin

maxcd = d;

end

else begin

maxcd = c;

end

maxabs = {1'b0, maxab};

maxcds = {1'b0, maxcd};

maxcdc = (~maxcds) + 33'd1;

cmp\_ab\_cd = maxabs + maxcdc;

if(cmp\_ab\_cd[32]) begin

max = maxcd;

end

else begin

max = maxab;

end

end

endmodule