module sixteen\_sign(a,b,clk,asign,bsign,m,sign);

input [15:0] a;

input [15:0] b;

input clk;

input asign;

input bsign;

output [31:0] m;

output sign;

wire s1,s2,s3,s4;

wire [15:0]f1;

wire [15:0]f2;

wire [15:0]f3;

wire [15:0]f4;

wire c1,c2,c3,c4,c5,c6,c7,c8,c9,c10,c11,c12,c13,c14,s12;

eight\_sign p1(a[7:0],b[7:0],clk,0,0,f1[15:0],s1);

eight\_sign p2(a[15:8],b[7:0],clk,0,0,f2[15:0],s2);

eight\_sign p3(a[7:0],b[15:8],clk,0,0,f3[15:0],s3);

eight\_sign p4(a[15:8],b[15:8],clk,0,0,f4[15:0],s4);

buf(m[0],f1[0]);

buf(m[1],f1[1]);

buf(m[2],f1[2]);

buf(m[3],f1[3]);

buf(m[4],f1[4]);

buf(m[5],f1[5]);

buf(m[6],f1[6]);

buf(m[7],f1[7]);

wire v1,v2,v3,v4,v5,v6,v7,c15,c16,c17,c18,c19,c20,c21,c22,c23,c24,c25,c26,c27,c28,c29,c30,c31,c32,c33,c34,c35,c36,c37,c38;

wire c39,c40,c41,c42,c43,c44,c45,c46,c47,c49,c50,c51,c52,c53,c54,c55,c56,c57,c58,c59,c60,c61,c62,c63,c64,c65,c66,c67,c68,c69;

fa ff1(f1[8],f2[0],f3[0],m[8],c1);

fa ff2(f1[9],f2[1],f3[1],v1,c2);

hal hh1(v1,c1,m[9],c3);

hal hh2(c2,c3,c4,c5);

fa ff3(f2[2],f1[10],f3[2],v2,c6);

hal hh3(v2,c4,m[10],c7);

hal hh4(c6,c7,c8,c9);

fa ff4(f2[3],f3[3],f1[11],v3,c10);

fa ff5(v3,c5,c8,m[11],c11);

hal hh5(c10,c11,c12,c13);

fa ff6(f2[4],f3[4],f1[12],v4,c14);

fa ff7(v4,c9,c12,m[12],c15);

hal hh6(c14,c15,c16,c17);

fa ff8(f2[5],f3[5],f1[13],v5,c18);

fa ff9(v5,c13,c16,m[13],c19);

hal hh7(c18,c19,c20,c21);

fa ff10(f2[6],f3[6],f1[14],v6,c22);

fa ff11(v6,c17,c20,m[14],c23);

hal hh8(c22,c23,c24,c25);

fa ff12(f2[7],f3[7],f1[15],v7,c26);

fa ff13(v7,c21,c24,m[15],c27);

hal hh9(c26,c27,c28,c29);

fa ff14(f2[8],f3[8],f4[0],v8,c30);

fa ff15(v8,c25,c28,m[16],c31);

hal hh10(c30,c31,c32,c33);

fa ff16(f2[9],f3[9],f4[1],v9,c34);

fa ff17(v9,c29,c32,m[17],c35);

hal hh11(c34,c35,c36,c37);

fa ff18(f2[10],f3[10],f4[2],v10,c38);

fa ff19(v10,c33,c36,m[18],c39);

hal hh12(c38,c39,c40,c41);

fa ff20(f2[11],f3[11],f4[3],v11,c42);

fa ff21(v11,c37,c40,m[19],c43);

hal hh13(c42,c43,c44,c45);

fa ff22(f2[12],f3[12],f4[4],v12,c46);

fa ff23(v12,c41,c44,m[20],c47);

hal hh14(c46,c47,c48,c49);

fa ff24(f2[13],f3[13],f4[5],v13,c50);

fa ff25(v13,c45,c48,m[21],c51);

hal hh15(c50,c51,c52,c53);

fa ff26(f2[14],f3[14],f4[6],v14,c54);

fa ff27(v14,c49,c52,m[22],c55);

hal hh16(c54,c55,c56,c57);

fa ff28(f2[15],f3[15],f4[7],v15,c58);

fa ff29(v15,c53,c56,m[23],c59);

hal hh17(c58,c59,c60,c61);

fa ff30(f4[8],c60,c57,m[24],c62);

fa ff31(f4[9],c61,c62,m[25],c63);

hal hh18(f4[10],c63,m[26],c64);

hal hh19(f4[11],c64,m[27],c65);

hal hh20(f4[12],c65,m[28],c66);

hal hh21(f4[13],c66,m[29],c67);

hal hh22(f4[14],c67,m[30],m[31]);

xor(sign,asign,bsign);

endmodule