PRACTICAL: 04 SUBBMISSION

Name: Tanmay Bisen, Roll No. 81, Shift-II

1. BCD adder:

entity BCDadder1 is

port(l1,l2,l3,l4,m1,m2,m3,m4,cinput:in bit;sm1,sm2,sm3,sm4,outtercarry:out bit);

end BCDadder1;

architecture struct of BCDadder1 is

component andf

port(x,y:in bit;z:out bit);

end component;

component fourbitadder

port(r0,r1,r2,r3,t0,t1,t2,t3,incarry0: in bit ; out0,out1,out2,out3,outcarry4: out bit);

end component;

component orf

port(a,b:in bit;c:out bit);

end component;

component notf

port(s1:in bit;sout:out bit);

end component;

signal intmsum1,intmsum2,intmsum3,intmsum4,adder1carry,intermx,orout01,andout01,orout02,adder0in:bit;

begin

po0: fourbitadder port map (l1,l2,l3,l4,m1,m2,m3,m4,cinput,intmsum1,intmsum2,intmsum3,intmsum4,adder1carry);

po1: orf port map (intmsum2,intmsum3,orout01);

po2: andf port map (orout01,intmsum4,andout01);

po3: orf port map (andout01,adder1carry,intermx);

po4: fourbitadder port map (adder0in,intermx,intermx,adder0in,intmsum1,intmsum2,intmsum3,intmsum4,cinput,sm1,sm2,sm3,sm4,outtercarry);

end struct;

1. BCD subtractor using 9’s complement method:

entity BCDsub9scomp is

port(u1,u2,u3,u4,i1,i2,i3,i4,boin:in bit;res1,res2,res3,res4,outbw:out bit);

end BCDsub9scomp;

architecture struct of BCDsub9scomp is

component andf

port(x,y:in bit;z:out bit);

end component;

component fourbitadder

port(r0,r1,r2,r3,t0,t1,t2,t3,incarry0: in bit ; out0,out1,out2,out3,outcarry4: out bit);

end component;

component BCDadder1

port(l1,l2,l3,l4,m1,m2,m3,m4,cinput:in bit;sm1,sm2,sm3,sm4,outtercarry:out bit);

end component;

component orf

port(a,b:in bit;c:out bit);

end component;

component notf

port(s1:in bit;sout:out bit);

end component;

component xorf

port(q,w:in bit;e:out bit);

end component;

signal vari00,vari11,xout1,xout2,xout3,xout4,sumo1,sumo2,sumo3,sumo4,summ01,summ02,summ03,summ04,adcout1,adcout2,dout,xou1,xou2,xou3,xou4:bit;

begin

mn1: xorf port map (i1,vari11,xout1);

mn2: xorf port map (i2,vari11,xout2);

mn3: xorf port map (i3,vari11,xout3);

mn4: xorf port map (i4,vari11,xout4);

mn5: fourbitadder port map (xout1,xout2,xout3,xout4,vari00,vari11,vari00,vari11,boin,sumo1,sumo2,sumo3,sumo4,adcout1);

mn6: BCDadder1 port map (u1,u2,u3,u4,sumo1,sumo2,sumo3,sumo4,boin,summ01,summ02,summ03,summ04,adcout2);

mn7: notf port map (adcout2,dout);

mn8: xorf port map (summ01,dout,xou1);

mn9: xorf port map (summ02,dout,xou2);

mn10: xorf port map (summ03,dout,xou3);

mn11: xorf port map (summ04,dout,xou4);

mn12: fourbitadder port map (xou1,xou2,xou3,xou4,vari00,dout,vari00,dout,adcout2,res1,res2,res3,res4,outbw);

end struct;

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