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1  library IEEE;
2  use IEEE.STD_LOGIC_1164.ALL;
3  use IEEE.STD_LOGIC_ARITH.ALL;
4  use IEEE.STD_LOGIC_UNSIGNED.ALL;
5
6  entity Microprocessador is
7      Port (
8          Reset : in STD_LOGIC;
9          CLK : in STD_LOGIC
10     );
11 end Microprocessador ;
12
13 architecture Estructural of Microprocessador is
14
15     constant CONST31 : std_logic_vector(4 downto 0) := "01111";
16     constant CONST0 : std_logic_vector(4 downto 0) := "00000";
17     signal l_sor1, l_sor2,e_reg,l_mem,e_mem,e_mar,l_mdr,e_mdr,e_ir,l_pc,e_pc,pc_sup,inc_pc
,l_despl,l_desp2,l_extsign,l_acc,e_acc,Tancar,z,c : STD_LOGIC;
18     signal mux_dest : STD_LOGIC_VECTOR(1 DOWNT0 0);
19     signal op_alu : STD_LOGIC_VECTOR(2 downto 0);
20     signal rdest : STD_LOGIC_VECTOR (4 downto 0);
21     signal Instruccio, DB3 , DB2, DB1 , Alu_op1, Alu_op2, Sortida_Extensio,Adresa_RAM,
Resultat_ALU , Dades_RAM , Dades_Out_Ram, Dades_Out_MDR_Ram : STD_LOGIC_VECTOR( 31 downto
0);
22
23 begin
24
25     -- Unitat de Control --
26     uc: UnitatDeControl port map ( Reset,CLK ,Instruccio(31 downto 26),Instruccio (5 downto
0),z , c , l_sor1,l_sor2,e_reg,mux_dest,l_mem,e_mem,e_mar,l_mdr,e_mdr,e_ir,l_pc,e_pc,
pc_sup,inc_pc,l_despl,l_desp2,l_extsign,l_acc,e_acc,Tancar,op_alu);
27
28     -- Registre d'Instruccio --
29     ir: Latch32Bits port map ( CLK ,e_ir,RESET,DB3 ,Instruccio);
30
31     mx: Mux4a1_5Bits port map ( mux_dest ,Instruccio(20 downto 16),Instruccio(15 downto 11)
,CONST31 ,CONST0, rdest );
32
33     -- Banc de Registres --
34     breg: BancRegistres port map ( Reset ,CLK ,e_reg ,rdest ,DB3 ,l_sor1 ,Instruccio(25
downto 21) ,l_sor2 ,Instruccio(20 downto 16) ,DB1, DB2);
35
36     pcs: PCSUP port map ( pc_sup ,DB1, Alu_op1 );
37
38     pc: ComptadorPrograma port map ( Reset,CLK , inc_pc,l_pc , e_pc , DB3 ,DB1);
39
40     d1: Desp25a0 port map ( l_desp2 , Instruccio(25 downto 0) , DB2 );
41
42     d2: DespExtSign15a0 port map ( l_despl ,Sortida_Extensio ,DB2);
43
44     exts: ExtensioDeSigne port map ( l_extsign ,Instruccio (15 downto 0) , DB2,
Sortida_Extensio);
45
46     alu: ALU32 port map ( op_alu , Alu_op1 ,DB2 , Resultat_ALU , z,c);
47
48     acc: Acumulador port map (CLK ,l_acc , e_acc ,Resultat_ALU ,DB3);
49
50     ma: RegistreMAR port map ( e_mar,DB1 , Adresa_RAM);
51
52     mr: RAMSin port map ( CLK,e_mem ,l_mem ,Adresa_RAM(7 downto 2) ,Dades_RAM ,
Dades_Out_Ram);
53
54     mdr: RegistreMDR port map ( CLK ,Reset ,e_mdr ,l_mdr ,l_mem ,DB2 ,Dades_Ram,
Dades_Out_Ram ,DB3);
55
56     enl: EnllacBus port map ( Tancar , DB3 , DB1);
57 end Estructural;

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