VHDL Code for CPLD game

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library IEEE;
use IEEE.STD_LOGIC_1164.ALL;
use IEEE.STD_LOGIC_ARITH.ALL;
use IEEE.STD_LOGIC_UNSIGNED.ALL;


entity game is
   port(switch : in STD_LOGIC;
        clk : in STD_LOGIC;
        pwin : out STD_LOGIC;
        plose : out STD_LOGIC;
          over : out STD_LOGIC;
          press : out STD_LOGIC;
        display1 : out STD_LOGIC_VECTOR(6 downto 0);
          display2 : out STD_LOGIC_VECTOR(6 downto 0)
          );
end game;


architecture behav of game is
signal eq53,eq42,eq61,enb,match,latch_old,d_enb : STD_LOGIC;
shared variable counter1 : integer range 0 to 7;
shared variable counter2 : integer range 0 to 7;
signal sum: integer range 0 to 12;
signal reg : integer range 0 to 12;
signal output : STD_LOGIC_VECTOR(6 downto 0);
type STATE_TYPE is (reset,enb_c,win,lose,nop1,latch,nop2,stage2,enb_c1);
begin

      controlPath : process (clk,eq53,eq42,match)
                    variable state : STATE_TYPE;
                    begin

                    if (clk'event and clk = '1') then

                    CASE state is

                    WHEN reset => output<= "0011010";
                                  if(switch = '0') then
                                    state:=enb_c;
                                  end if;

                    WHEN enb_c => output<= "1011110";
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                if(switch = '1') then
                   state:=nop1;
                   output(6)<='0';
                end if;

WHEN nop1 => output<="0011111";
                 if eq53 = '1' then
                   state:=win;
                elsif eq42 = '1' then
                   state:=lose;
                else
                   state:=latch;
                end if;

WHEN win => output<="0001001";
              if switch='0' then
                state:=enb_c;
              end if;

WHEN lose =>output<="0010001";
              if switch='0' then
                state:=enb_c;
              end if;

WHEN latch =>output<="0111111";
                state:=stage2;

WHEN nop2 => output<="0011111";
                if match = '1' then
                   state:=win;
                else
                   state:=lose;
                end if;

WHEN enb_c1 =>output<="1011110";
                if(switch = '1') then
                   state:=nop2;
                   output(6)<='0';
                end if;

WHEN stage2 =>output<="0011011";
                if(switch = '0') then
                   state:=enb_c1;
                end if;

END CASE;
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            end if;


            end process controlPath;

DATAFLOW : BLOCK
BEGIN

counter :process(clk)

          begin
          if(clk'event and clk = '1' and enb = '1') then
                counter1 := counter1+1;
                if(counter1 > 6) then
                   counter1    := 1;
                   counter2:=counter2+1;
                   if(counter2>6)    then
                      counter2:=1;
                   end if;
                end if;
                sum <= counter1 + counter2;
          end if;
       end process counter;



eq53 <= '1' WHEN sum = 5  ELSE
       '1' WHEN sum = 3  ELSE
         '1' WHEN sum = 7  ELSE
         '0';
eq42 <= '1' WHEN sum = 2  ELSE
       '1' WHEN sum = 4  ELSE
         '1' WHEN sum = 6  ELSE
         '0';

reg_latch: process(latch_old)
begin
if(latch_old'event and latch_old = '1') then
   reg<=sum;
end if;
end process reg_latch;

match <= '1' WHEN reg = sum ELSE '0';
```

```
        display1 <= "1111111" WHEN d_enb = '0' ELSE
                  "1001111" WHEN counter1 = 1 ELSE
                     "0010010" WHEN counter1 = 2 ELSE
                     "0000110" WHEN counter1 = 3 ELSE
                     "1001100" WHEN counter1 = 4 ELSE
                     "0100100" WHEN counter1 = 5 ELSE
                     "0100000" when counter1 = 6 ELSE
                     "0001111" when counter1 = 7 else
                     "0000000" when counter1 = 8 else
                  "0001100" when counter1 = 9;
              display2 <= "1111111" WHEN d_enb = '0' ELSE
                   "1001111" WHEN counter2 = 1 ELSE
                     "0010010" WHEN counter2 = 2 ELSE
                     "0000110" WHEN counter2 = 3 ELSE
                     "1001100" WHEN counter2 = 4 ELSE
                     "0100100" WHEN counter2 = 5 ELSE
                     "0100000";
        pwin <=output(4);
        plose <=output(3);
        press <= output(2);
        over<= output(1);
        enb<=output(6);
        latch_old<=output(5);
        d_enb<=output(0);

    END BLOCK DATAFLOW;

end behav;
```