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-- Company:

-- Engineer:

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-- Create Date: 12.03.2020 10:33:51

-- Design Name:

-- Module Name: project\_10\_pwm - Behavioral

-- Project Name:

-- Target Devices:

-- Tool Versions:

-- Description:

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-- Dependencies:

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-- Revision:

-- Revision 0.01 - File Created

-- Additional Comments:

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library IEEE;

use IEEE.std\_logic\_1164.all;

use IEEE.numeric\_std.all;

use IEEE.std\_logic\_unsigned.all;

-- Uncomment the following library declaration if instantiating

-- any Xilinx leaf cells in this code.

--library UNISIM;

--use UNISIM.VComponents.all;

entity main is

port (

clk : in std\_logic;

sw : in STD\_LOGIC\_VECTOR(15 DOWNTO 0); --interruptores

btnU : in STD\_LOGIC; --boton arriba

btnD : in STD\_LOGIC; --boton abajo

btnL : in STD\_LOGIC; --boton izquierda

btnR : in STD\_LOGIC; --boton derecha

btnC : in STD\_LOGIC; --boton central

led : out STD\_LOGIC\_VECTOR(15 DOWNTO 0); --leds

seg : out STD\_LOGIC\_VECTOR(6 DOWNTO 0); --siete segmentos

dp : out STD\_LOGIC; --punto decimal del seite segmentos

an : out STD\_LOGIC\_VECTOR(3 DOWNTO 0); -- control de 7-seg

dcmotor : out std\_logic\_vector (1 downto 0)

);

end main;

architecture Behavioral of main is

signal estado: std\_logic\_vector (2 downto 0);

signal cont\_flancos: integer range 0 to 500000;

signal pwm\_tope: integer range 0 to 500000;

signal sentido\_giro: std\_logic;

signal pwm: std\_logic;

signal duty\_cycle: integer range 0 to 100;

signal inicio: std\_logic;

begin

duty\_cycle <= 50;

sentido\_giro <= '0';

dcmotor <= sentido\_giro & pwm;

inicio <= btnC;

pwm\_tope <= 250000;

process(clk, inicio)

begin

if inicio = '1' then

estado <= "000";

cont\_flancos <= 0;

elsif rising\_edge(clk) then

case estado is

when "000" =>

cont\_flancos <= 0;

if duty\_cycle /= 0 then

estado <= "001";

else

estado <= "100";

end if;

when "001" =>

cont\_flancos <= 1;

estado <= "010";

when "010" =>

cont\_flancos <= cont\_flancos + 1;

if cont\_flancos < pwm\_tope then

estado <= "010";

else

if duty\_cycle /= 100 then

estado <= "011";

else

estado <= "001";

end if;

end if;

when "011" =>

cont\_flancos <= cont\_flancos +1;

if cont\_flancos < 500000 then

estado <= "011";

else

if duty\_cycle /= 0 then

estado <= "001";

else

estado <= "100";

end if;

end if;

when "100" =>

cont\_flancos <= 1;

estado <= "011";

when others =>

cont\_flancos <= 0;

estado <= "000";

end case;

end if;

end process;

process(estado)

begin

case estado is

when "000" => pwm <= '0';

when "001" => pwm <= '1';

when "010" => pwm <= '1';

when "011" => pwm <= '0';

when "100" => pwm <= '0';

when others => pwm <= '0';

end case;

end process;

end Behavioral;