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-- Date: Jan 12, 2017

-- File: lec5.vhdl

-- HW: Lecture 5

-- Crs: ECE 383

-- Purp: This demonstrates some basic I/O as well as gated and ungated

-- outputs.

-- Documentation: No help, I based this off the class notes and readings.

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library IEEE;

use IEEE.STD\_LOGIC\_1164.ALL;

use IEEE.NUMERIC\_STD.ALL;

entity Lec5 is

Port ( clk : in STD\_LOGIC;

reset : in STD\_LOGIC;

btn : in STD\_LOGIC\_VECTOR (4 downto 0);

JB : out STD\_LOGIC\_VECTOR (7 downto 0));

end Lec5;

architecture Behavioral of Lec5 is

signal processQ: unsigned (7 downto 0);

constant L0: unsigned(7 downto 0) := "00101111";

constant L1: unsigned(7 downto 0) := "01011111";

constant L2: unsigned(7 downto 0) := "10111111";

begin

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-- The buttons are all nominally 0 and equal to 1 when pressed.

-- btn(3) = '1' Right

-- btn(1) = '1' Left

-- btn(2) = '1' Down

-- btn(0) = '1' Up

-- btn(4) = '1' Center

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process(clk)

begin

if (rising\_edge(clk)) then

if (reset = '0') then

processQ <= (others => '0');

elsif (btn(4) = '0') then

processQ <= processQ + 1;

end if;

end if;

end process;

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-- The upper nibble of JB will tell us about the range of processQ using combo logic

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process(clk)

begin

if (rising\_edge(clk)) then

if (reset = '0') then

JB(6 downto 4) <= "000";

elsif ((processQ >= 0) and (processQ < L0)) then

JB(6 downto 4) <= "001";

elsif ((processQ >= L0) and (processQ < L1)) then

JB(6 downto 4) <= "010";

elsif ((processQ >= L1) and (processQ < L2)) then

JB(6 downto 4) <= "100";

elsif (processQ >= L2) then

JB(6 downto 4) <= "111";

end if;

end if;

end process;

JB(7) <= clk;

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-- The lower nibble of JB will tell us about the range of processQ using gated logic

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JB(3 downto 0) <= "0001" when ((processQ >= 0) and (processQ < L0)) else

"0010" when ((processQ >= L0) and (processQ < L1)) else

"0100" when ((processQ >= L1) and (processQ < L2)) else

"1000";

end Behavioral;