

LAB Assignment #1, for ECE 338

Assigned Sept 12th

Due Sept 17th

Description: Create a project with behavioral VHDL and evaluate the behavioral-to-hardware translation process.

Use Vivado to create a project. Add the following VHDL code which uses an if statement within a process block. Open 'elaborated design' and identify components of the schematic that correspond to elements of the VHDL code. Please keep your lab report to 1 page, and include your name and the title "Lab #1: Behavioral-to-Schematic Translation, if statement". DO NOT EMAIL ANY LAB REPORTS. Print them out and give them to me in class.

```
library IEEE;
use IEEE.STD_LOGIC_1164.ALL;
use IEEE.NUMERIC_STD.ALL;

entity FA_ED is
    Port ( a : in STD_LOGIC;
          b : in STD_LOGIC;
          c : in STD_LOGIC;
          ctrl : in STD_LOGIC;
          Cout : out STD_LOGIC;
          sum : out STD_LOGIC
    );
end FA_ED;

architecture rtl of FA_ED is
begin

    process (a, b, c)
    begin
        Cout <= '0';
        sum <= '0';

        if (ctrl = '0') then
            Cout <= ((a and b) or (a and c) or (b and c)) and (not a
and not b and not c);
            sum <= '0';
        else
            Cout <= (a and b) or (a and c) or (b and c);
            sum <= a xor b xor c;
        end if;
    end process;
end rtl;
```

This lab is worth 10 points and only involves a hardware demo.