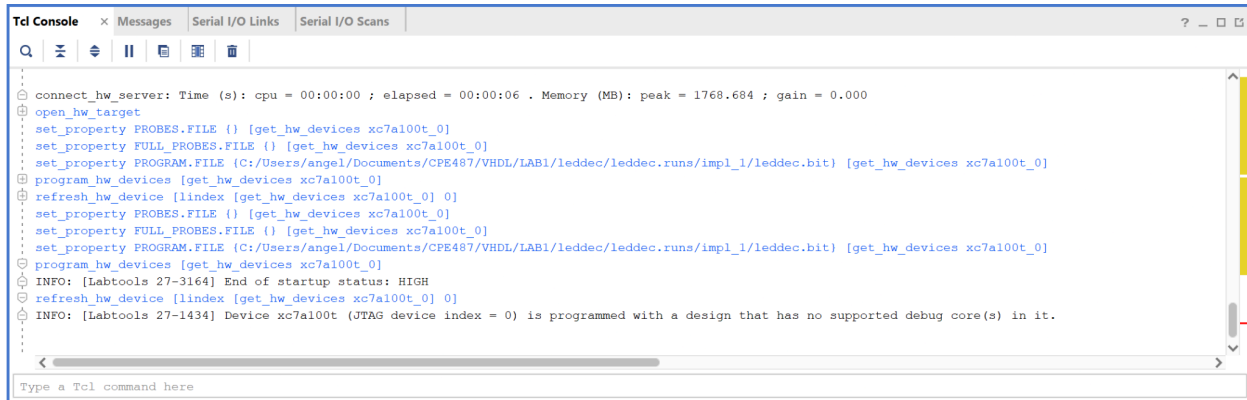


# Lab 1

Adrian Torres and Angel Ordonez Retamar

## Project 1



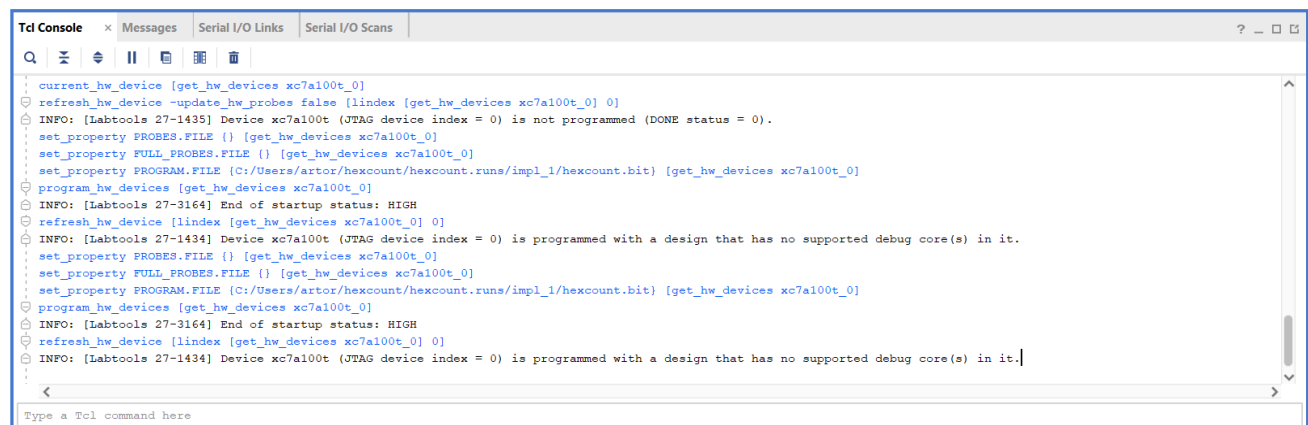
```
connect_hw_server: Time (s): cpu = 00:00:00 ; elapsed = 00:00:06 . Memory (MB): peak = 1768.684 ; gain = 0.000
open_hw_target
set_property PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property FULL_PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property PROGRAM.FILE (C:/Users/angel/Documents/CPE487/VHDL/LAB1/leddec/leddec.runs/impl_1/leddec.bit) [get_hw_devices xc7a100t_0]
program_hw_devices [get_hw_devices xc7a100t_0]
refresh_hw_device [lindex [get_hw_devices xc7a100t_0] 0]
set_property PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property FULL_PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property PROGRAM.FILE (C:/Users/angel/Documents/CPE487/VHDL/LAB1/leddec/leddec.runs/impl_1/leddec.bit) [get_hw_devices xc7a100t_0]
program_hw_devices [get_hw_devices xc7a100t_0]
INFO: [Labtools 27-3164] End of startup status: HIGH
refresh_hw_device [lindex [get_hw_devices xc7a100t_0] 0]
INFO: [Labtools 27-1434] Device xc7a100t (JTAG device index = 0) is programmed with a design that has no supported debug core(s) in it.
```

Video of Gray Code on the board for Project 1:

<https://youtu.be/kbMog1i682I>

no code modifications were necessary for Project 1, but I did make instructions on how to get the gray code to display one step at a time: 0 up, 1 up, 0 down, 2 up, 0 up, 1 down, 0 down, 3 up, 0 up, 1 up, 0 down, 2 down, 0 up, 1 down, 0 down,

## Project 2



```
current_hw_device [get_hw_devices xc7a100t_0]
refresh_hw_device -update_hw_probes false [lindex [get_hw_devices xc7a100t_0] 0]
INFO: [Labtools 27-1435] Device xc7a100t (JTAG device index = 0) is not programmed (DONE status = 0).
set_property PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property FULL_PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property PROGRAM.FILE (C:/Users/artor/hexcount/hexcount.runs/impl_1/hexcount.bit) [get_hw_devices xc7a100t_0]
program_hw_devices [get_hw_devices xc7a100t_0]
INFO: [Labtools 27-3164] End of startup status: HIGH
refresh_hw_device [lindex [get_hw_devices xc7a100t_0] 0]
INFO: [Labtools 27-1434] Device xc7a100t (JTAG device index = 0) is programmed with a design that has no supported debug core(s) in it.
set_property PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property FULL_PROBES.FILE {} [get_hw_devices xc7a100t_0]
set_property PROGRAM.FILE (C:/Users/artor/hexcount/hexcount.runs/impl_1/hexcount.bit) [get_hw_devices xc7a100t_0]
program_hw_devices [get_hw_devices xc7a100t_0]
INFO: [Labtools 27-3164] End of startup status: HIGH
refresh_hw_device [lindex [get_hw_devices xc7a100t_0] 0]
INFO: [Labtools 27-1434] Device xc7a100t (JTAG device index = 0) is programmed with a design that has no supported debug core(s) in it.
```

```
PROCESS (clk)
BEGIN
    IF clk'EVENT AND clk = '1' THEN -- on rising edge of clock
        cnt <= cnt + 3;
    END IF;
```

The counter in *counter.vhd* has been increased from 1 to 3 to increase the speed.

```

anode <= "11111110" WHEN data = "0000" ELSE -- 0
        "11111101" WHEN data = "0001" ELSE -- 1
        "11111011" WHEN data = "0010" ELSE -- 2
        "11110111" WHEN data = "0011" ELSE -- 3
        "11101111" WHEN data = "0100" ELSE -- 4
        "11011111" WHEN data = "0101" ELSE -- 5
        "10111111" WHEN data = "0110" ELSE -- 6
        "01111111" WHEN data = "0111" ELSE -- 7
        "11111110" WHEN data = "1000" ELSE -- 8
        "11111101" WHEN data = "1001" ELSE -- 9
        "11111011" WHEN data = "1010" ELSE -- A
        "11110111" WHEN data = "1011" ELSE -- B
        "11101111" WHEN data = "1100" ELSE -- C
        "11011111" WHEN data = "1101" ELSE -- D
        "10111111" WHEN data = "1110" ELSE -- E
        "01111111" WHEN data = "1111" ELSE -- F
"11111111";

```

The LED Segment Code has been changed in *leddec.vhd* so the hex position moves up after each hex digit

**Video of the board working:**

<https://youtube.com/shorts/vFzK-gRC8S0>