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Course: ECE445L

A) ***Objectives*:**

1. Review TM4C123 and Keil, learn how to use the lab power supply, DVM and the analog scope.

B) ***Hardware Design Deliverables:***

1. Deliverable 1: Using KiCad, draw the switch and LED circuits showing the connections to the microcontroller.

C) ***Software Design Deliverables:***

1. I have pushed my code to Git Hub for grading (Check box if true).

D) ***Measurement Data:***

1. Deliverable 1: LED current versus voltage for 4 voltages around 2V (lab power supply).

1. 1.722V,0.001A

2. 1.732V,0.001A

3. 1.742V,0.002A

4. 1.761V,0.002A

1. Deliverable 2 LED current and voltage measured with DVM. Calculate LED power.
   * + 1. 1.921V,1.988mA
       2. 0.0038W
2. Deliverable 3: Analog scope measurements showing the switch bounce. Determine the longest time the switch bounces.
   1. Longest bounce: 0.000224 msec

D) Analysis and Discussion (1 or 2 sentences each). In particular, answer these questions:

1) Compare your LED measured data with the LED data sheet. How are they similar and how are they different?

2) How did you set the scope mode and trigger to collect the bounce trace?

I connected the circuit to the oscilloscope to measure the switch. After inducing a bounce from the switch, I measured the length of the bounce in microseconds.

3) Explain how you removed switch bounce. What would have been other approaches to remove bounce?

4) Explain your software approach to “toggle the LED every third touch”. What would have been other approaches?

My approach to toggle the LED every third touch was to make a variable named “state,” and increment it every time the button was either pressed or released. Whenever “state” reaches 6, I turn the LED to the opposite state (i.e. turn on when originally off; turn off when originally on).