Requirements Specification for EE465 Lab Project 0: Heartbeat LED

Lab project goal: Basic circuit with heartbeat LED.

The Light Emitting Diode (LED) will indicate that the MSP430 is running properly. The heartbeat indicator provides a quick visual check of microcontroller operation. This is an important debugging feature that will let you know if your processor is doing "something". It will be continued for all subsequent labs, so make it easy to incorporate into your code. We will explore three different approaches to generating the heartbeat indicator.

Requirements for lab project completion:

Setup the MSP-EXP430FR2355 Launchpad Eval Board and Code Composer on either a lab computer or your laptop. Program this lab in assembly.

For this lab use one of the LED's (you pick) on the Launchpad board for the heartbeat indicator.

1. Program the microcontroller using something similar to the "fastloop" example program provided. This is the delay loop approach. Modify that program so that the LED is flashing at 0.5 Hz (1 sec on, 1 off). **Get signed off.**

2. Rewrite your code to using the timer module by modifiying the prescaler for the same flash rate. **Get signed off.**

3. Set the prescaler to "1" and modify the timer interrupt to have the required flash rate. Remember you can count the number of tiems the timer module overflows. **Get signed off .**

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6. Your project grade will be based on the memo report that you hand in during this or subsequent lab sessions and your demonstration of your code written for this lab.

Your **Memo Report** must include:

a. A memo report summarizing the methods you used to solve the problem for each section above.. Your memo report should include a flow chart for your program. See the "Example Lab Report" folder for an example. Please upload a single pdf to the Lab0 Dropbox on D2L that includes your memo report and flow charts.

b. Each student should upload their commented code to the Lab0 Dropbox on D2L. For this lab only upload your main file for part 3.

Memo Report Date: Thursday, January 23, 2020 (by 6 PM)

Code Demonstration:

c. A sign-off from the instructor or a TA indicating that your program performed as required and the required circuit modifications were completed. **Each lab team member must build and demo a hardware circuit to receive a sign off for their own circuit**. A sign-off sheet will be kept by the instructor and TA indicating completion of the lab.

1. Sign off for fast-loop modified

2. Sign off for prescaled timer overflow

3. Sign off for non-prescaled timer overflow

Demo Due Date: Tuesday, Jan 21, 2020 (by end of your lab time)