CECS 347 Lab 1. PLL

Preparation: You will need a LaunchPad.

Starter project: SysTickPLL

Reference Projects: SysTickPLL, HelloLaunchPad, EdgeInterrupt, PeriodicSysTickInts

Purpose:
The purpose of this lab is to learn how to use PLL to generate a specified high frequency system clock.

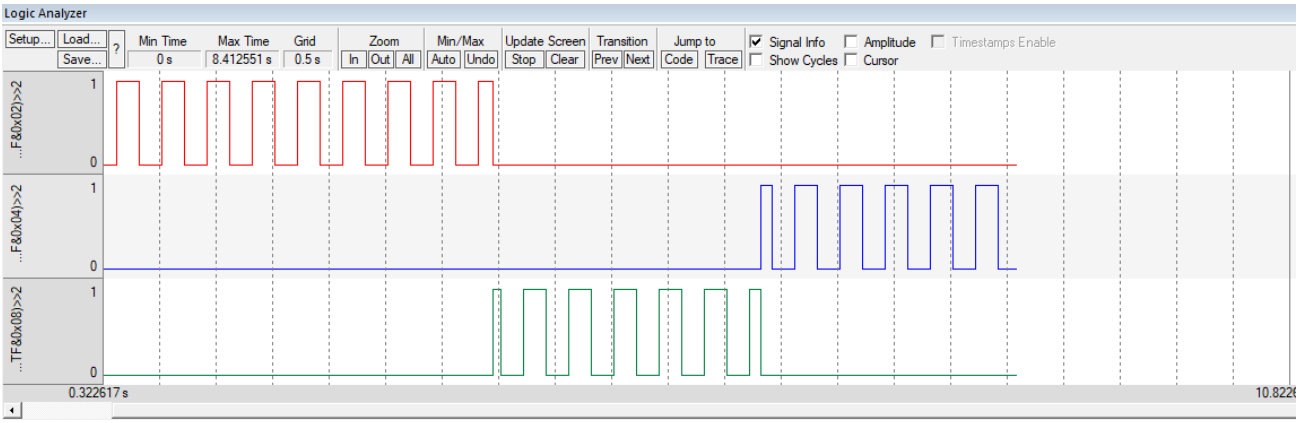
System Requirements:
In this lab, you will use the built-in PLL circuit to generate a 40MHz system clock, then use SysTick timer with interrupt to control the blinking of an onboard LED. The specified LED will blink at a frequency of 2Hz (0.25 seconds on, 0.25 seconds off). You will use the onboard push buttons to control the blinking of the onboard three LEDs. You are required to use edge-triggered interrupts for the onboard push buttons. The functionalities of your embedded system are given below:

1) Push button 1 (left push button) will be used to toggle LED blink/off. The default setting of the LED is off. (Start the system with LEDs off)
2) Push button 2 (right push button) will be used to select which LED to blink. The system will start from red LED. Press button 2 once will change the blinking LED to green, press button 2 twice will change the blinking LED to blue. Keep pressing button 2, will change the blinking LED in a round robin order.
3) Assume push button 1 and push button 2 will not be pressed at the same time.

Deliverable:
1) Simulate your system at Keil, capture all three possible outputs from the three LEDs, and submit a screenshot of the logic analyzer outputs. Make sure to show the grid of the logic analyzer outputs in your screenshot. Setup the grid of the logic analyzer to be 0.25s. Show the logic analyzer outputs to the instructor.
2) Demonstrate on board and video record your demonstration for the following operation:
   a. Test push button 1: press the reset button to start with LED off, press push button 1 multiple times to toggle LED blink blink/off.
   b. Test push button 2: while an LED is blinking, press push button 2 multiple time to observe the color of the LED changes in a round robin order, start from red color.
3) Submit a link to your demonstration video.
4) Software source code.

Please attach delivery items 1 & 3 to the end of this document and submit them in one document. You can choose to have one .c file as your source code or multiple .c and .h files as your source code.

Note: Please submit each required file separately. Do not submit a zip file.



Demo Link: https://youtu.be/XPK3pkShJRQ