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**TO:** Dr. Winikus  
**FROM:** Katherine Stock  
**Subject:** Project 2 Stage 2 Midpoint Memo  
**Date:** 10/14/21

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**PURPOSE:**

The task of creating a count-down alarm clock is being approached using C++ and a Nucleo-L4R5ZI. The program is currently broken into many stages based on rows and columns for the 4x4 matrix keypad. The content will explain progress made so far and the plan for the next three weeks of work.

**SUMMARY:**

Project 2 is a bare-metal, count-down alarm system. The system uses a 4x4 keypad for input and LEDs and an LCD as output. The LCD displays the time remaining and signals when the timer is up. One LED will light up when inputs are received from the keypad and all will light up when the time is up.

**UPDATE ON PROGRESS:**

So far, the keypad and keypad LEDs have been implemented with a corresponding LED lighting up on output from a key in that column. Each column has an outlined ISR defining which specific key was pressed – more will be added to this implementation to handle bounce in relation to the clock, accumulating the timer value, and working with the clock.

**CONCERNS:**

A concern is handling bounce so that each key press is only registered once in a certain time frame. Currently, the value of the pressed key is being stored in a volatile variable and is being printed to verify the read key; however, when a key is not being pressed, the value floats between many keys and is unpredictable.

**RECOMMENDATION:**

The next phase of work includes further reading of documentation for the LCD and finishing set up for this peripheral. Information for a future phase of work will be provided in lecture and work on the clock will begin after this.