Oakland University
School of Electrical & Computer Engineering
Winter 2023
ECE 4721/5721
Professor Phares A. Noel, II Ph.D., PE

Lab #1
Due on Friday February 3,2023
Laboratory located in EC 461

Note: *All students in this course have access to the Lab with OU ID card. Enter last 4 digits of your G number and press enter.*

Objectives:

1. Download the Software tools to your laptop.

- Get Started with the FRDM-KL25Z- Click the link below for a simple video of the NXP software platform and initial

  https://www.nxp.com/document/guide/get-started-with-the-frdm-kl25z:NGS-FRDMKL25Z

- Overview of the FRDM-KL25Z Development board and code examples. https://os.mbed.com/platforms/KL25Z/

- Keil - Integrated Development Environment (IDE) for the ARM Processor http://www2.keil.com/NXP/ Arm Keil MDK and MCUXpresso

2. Follow the document on Moodle titled "Using keil MDK – 30 page PDF" and read parts 1-8 to configure Keil and run the Blinky example on the FRDM-KL25Z.

Use the debugger to create a breakpoint on Line 43 of the Blinky example and note in your report which color the LED displays for each value of 'led_num'. Information on using the debugger is provided in steps 9-13 of the guide.

3. Learn to create a project, write a simple program in C, compile, run, and debug.

Follow "Using keil MDK – 30 page PDF" part 24 to create a new Keil project from scratch and create a simple counter to run on the KL25Z. Use the debugger to verify it is running properly.

Note: Keil may optimize the loop to remove the counter code in the while loop, preventing the debugger from adding a breakpoint or adding the counter to the watch window. *If this happens navigate to* ***Target Options > C/C++ (AC6)*** *and set Optimization to -O0 under Language/Code generation then hit the rebuild button.*

Note: All work should be submitted according to the guidelines published in Moodle for this class. Failure to do so will result in points being deducted from your grade.

Report Grading Rubric:

Note: *Submission must have mandatory Title Page with Name/Date, etc. per syllabus. 5 points will be deducted from final score if not present in submission.*
Title Page with Name/Date (5%)

Part 1, Installing Keil (10%)

Part 2, Blinky Example (Total 50%)
- 20% - Values of led_num for each LED color
- 10% - Image of debugger window showing led_num
- 10% - Source code
- 10% - Description of experiment

Part 3, Creating a project (Total 40%)
- 10% - Screenshot showing counter value in debug window
- 10% - Source Code
- 10% - Flow Diagram of Program
- 10% - Description of experiment