**EET 4250 Lab 5**

**Using Systick Interrupts for Audio Output on the TM4C/LM4F**

**Functional Description**

In this lab you will output a digital wave from the TM4C by using Systick Interrupts to output a number from 0 to 15 over four pins on an output port. This wave will then be converted to analog using a simple resistor pattern acting as a digital to analog converter. Finally, the wave will be sent to a headphone speaker so that it can be heard audibly. Because much of the software has already been provided, please find a sequence of at least 5 notes to play over the speaker. There will also be a switch input which acts as a play/pause button.

**Instructions**

1. Use the Lab 5 starter project and make the necessary modifications and add a play/pause button.
2. Modify songs.h to play your own sequence of notes.
3. Show the instructor when completed. Use the functional description above as a measure of completeness. Use the deliverables below to know what to turn in.

**Deliverables**

With your code, turn in a professional report which includes the following information:

* Cover sheet with name(s), course number, lab number, and project title.
* Description of what the program aims to accomplish.
* How the program works or ideas on why it doesn’t work. Include any limitations of the algorithm, implementation, or other related hardware/software limitations.
* Choose one of the following options to display a general overview of execution flow.
  + Flowchart
  + Data flow graph
  + Circuit diagram
* A summary or thoughts on experiences while doing the lab. Suggestions for the future are welcomed.

**Lab Submission**

1. Close uVision to release any file locks.
2. Compress this lab’s folder into a .zip file.
3. In the labs section of Blackboard, click on the title of this lab, and you will be taken to a submission form.
4. Attach your lab’s .zip file here as well as your lab report.