Name: \_\_Replace with your name(s)\_\_\_\_

EID: \_\_Replace with your EID(s)\_\_\_\_\_

Semester: Spring 2025

Course: ECE445L

1. ***Objectives*:**

1. In a few sentences, describe the purpose of the lab and the features of your system.

2. ***Hardware Design Deliverables:***

1. Deliverable 1: Using KiCad, create a schematic or figure showing all external components connected to the TM4C123 board. You do not need to show hardware components on the TM4C123 LaunchPad board. Include a screenshot below.

3. ***Software Design Deliverables:***

I have pushed my code to GitHub for grading (Write yes if true): \_\_\_\_

1. Briefly describe the system design. Include a data flow and call graph if your system is different than Figure 9.1 and 9.2.
2. Describe your message encoding scheme. Include any diagrams or graphs.
3. A list of unit and integration tests written for the lab, pointing to the full source code in the GH classroom.

4. ***Measurement Data:***

1. Deliverable 2: Quantized waveform of DAC output dump and relevant context.
2. Deliverable 3: Quantized waveform of ADC input dump and relevant context.
3. Deliverable 4: System module encoder and decoder CPU utilization.
4. Deliverable 5: Quantification of system performance.

5. ***Analysis and Discussion Questions:***

1. What is the Nyquist Theorem and Valvano Postulate and how do they apply to this lab?
2. How did you eliminate noise in the sampled audio?
3. How does your protocol allow (or doesn’t allow) communication in the presence of background noise?
4. How could you improve the bandwidth or baud rate of your system?