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

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

Semester: Spring 2024

Course: ECE445L

A) ***Objectives*:**

1. Describe in a few sentences what the purpose of this lab is.

B) ***Hardware Design Deliverables:***

1. Deliverable 1: Using KiCad or pen & paper, draw the circuit used to produce the analog voltage you measured (See figure 2.1).

C) ***Software Design Deliverables:***

1. I have pushed my code to Git Hub for grading (Check box if true).

D) ***Measurement Data:***

1. Deliverable 2: Picture of analog AC RMS or peak-to-peak noise on scope.
2. Deliverable 3 (2pt EC): Picture of analog amplitude vs frequency noise on scope.
3. Deliverable 4: Measurements of ISR execution on logic analyzer.
4. Deliverable 5: Timer2A jitter measurement.
5. Deliverable 6: Hardware averaging pictures for SAC=0, 2, 4, and 6.
6. Deliverable 7 (2pt EC): ADC resolution estimation.
7. Deliverable 8: Evaluate Critical Sections

## Deliverable 9 (10pt EC): Floating and Fixed Point Comparison

E) ***Analysis and Discussion Questions:***

1. Define “minimally intrusive”.
2. The ISR toggles PF2 three times. Is this debugging intrusive, nonintrusive or minimally intrusive? Justify your answer.
3. In this lab we dumped strategic information into arrays and processed the arrays later. Notice this approach gives us similar information we could have generated with a printf statement. In what ways are printf statements better than dumps? In what ways are dumps better than printf statements?
4. What are the necessary conditions for a critical section to occur? In other words, what type of software activities might result in a critical section?
5. The PMF results should show hardware averaging is less noisy than not averaging. If it is so good, why don’t we always use it?