

**California Polytechnic State University Pomona**

DEPARTMENT OF ELECTRICAL & COMPUTER ENGINEERING

IINTRO TO MICROCONTROLLERS LAB

ECE 3301L.03

Report #4

**LAB 5 – A/D Converter, Temperature Sensor & Light Sensor**

Prepared by

**Kelly Williams**

**and**

**Isaac Bernal**

Presented to

Felix Pinai

October 2, 2024

# TABLE OF CONTENTS

[TABLE OF CONTENTS 2](#_Toc178863425)

[INTRODUCTION 3](#_Toc178863426)

[Objective 3](#_Toc178863427)

[Summary 3](#_Toc178863428)

[DATA AND RESULTS 3](#_Toc178863429)

[CONCLUSION 3](#_Toc178863430)

# INTRODUCTION

## Objective

This lab will encourage students to come up with their own unique approach at accomplishing the required tasks. Students will write their own C code to create an analog/digital converter that will take an analog voltage input, convert it to a digital temperature reading, and that temperature will be outputted to a 7-segment display.

## Summary

This lab is back to coding in C, however students must come up with mostly their own code instead of using a given template for a majority of the code required. There is the addition of new hardware, including a transistor, temperature sensor, and 7 segment display that students must interface with and collect data from/output data to. Individual approaches to solving these challenges are required, ensuring that students have a full understanding of the complexities of the code and requirements so they can determine how to make those requirements a reality. This includes knowing when to make the program wait one second before outputting to the display, and so on. Critical thinking will be challenged as the labs become more complex with less guidance.

# DATA AND RESULTS

Unfortunately our screenshots of the Tera Term outputs didn’t save correctly so we do not have any pictures.

# CONCLUSION

In this lab, students successfully engaged in hands-on coding and hardware interfacing, culminating in the creation of a functioning analog/digital converter that outputs temperature readings to a 7-segment display. By taking ownership of their coding process, students demonstrated critical thinking and problem-solving skills, navigating the complexities of integrating various components such as transistors and temperature sensors. The emphasis on individualized approaches not only enhanced their understanding of the underlying concepts but also fostered creativity in tackling programming challenges.