Lab 7 Report

Introduction

This lab has tasked us with creating a voltage divider circuit using a normal resistor and an LDR. The circuit will detect the difference in voltage using voltage division across the LDR, which will change depending on the luminosity of the surrounding environment. The MSP430 will then display the voltage on the LCD and change the pitch of the attached Piezo buzzer. The user can press BTN 1 to turn the buzzer off or on.

Microcontroller Concept

- GPIO 1.3, 2.0
- LCD
- BTN 1

GPIO 1.3 is used to divide the voltage between the LDR and 1kΩ resistor. It is used because it is connected to the ADC which is needed to convert the analog signal to digital which will be the output to both the Piezo buzzer and LCD. GPIO 2.0 is used as the output to the Piezo buzzer, which will display the voltage and change according to the output of the voltage divider circuit.
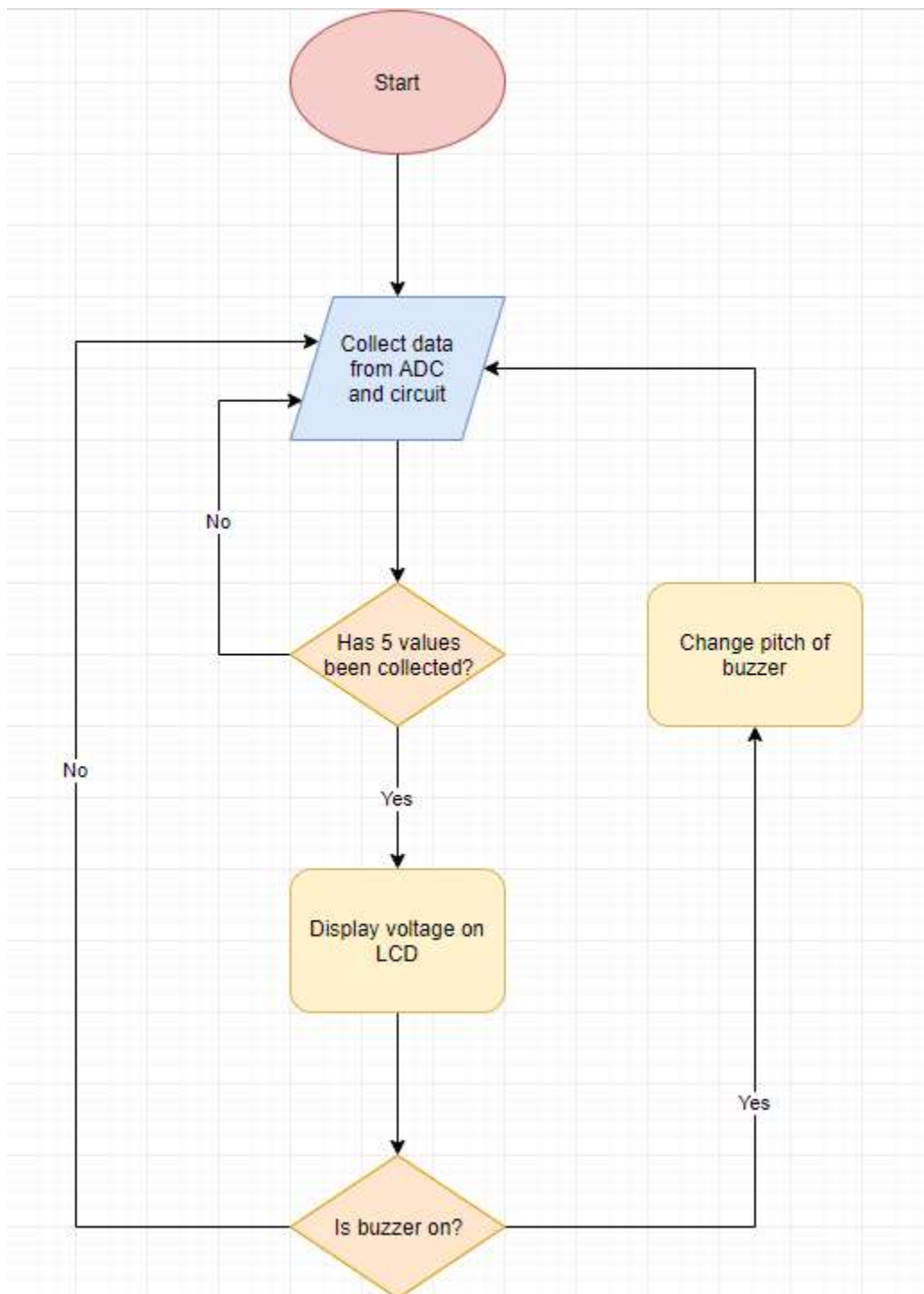
The LCD is used to display the numeric value of the voltage that the voltage divider circuit will provide. The LCD is used because it is the best way to display numeric data to the user.

BTN 1 is used to turn off or on the Piezo buzzer. It is used because it is the most readily available button to use.

Hardware Design
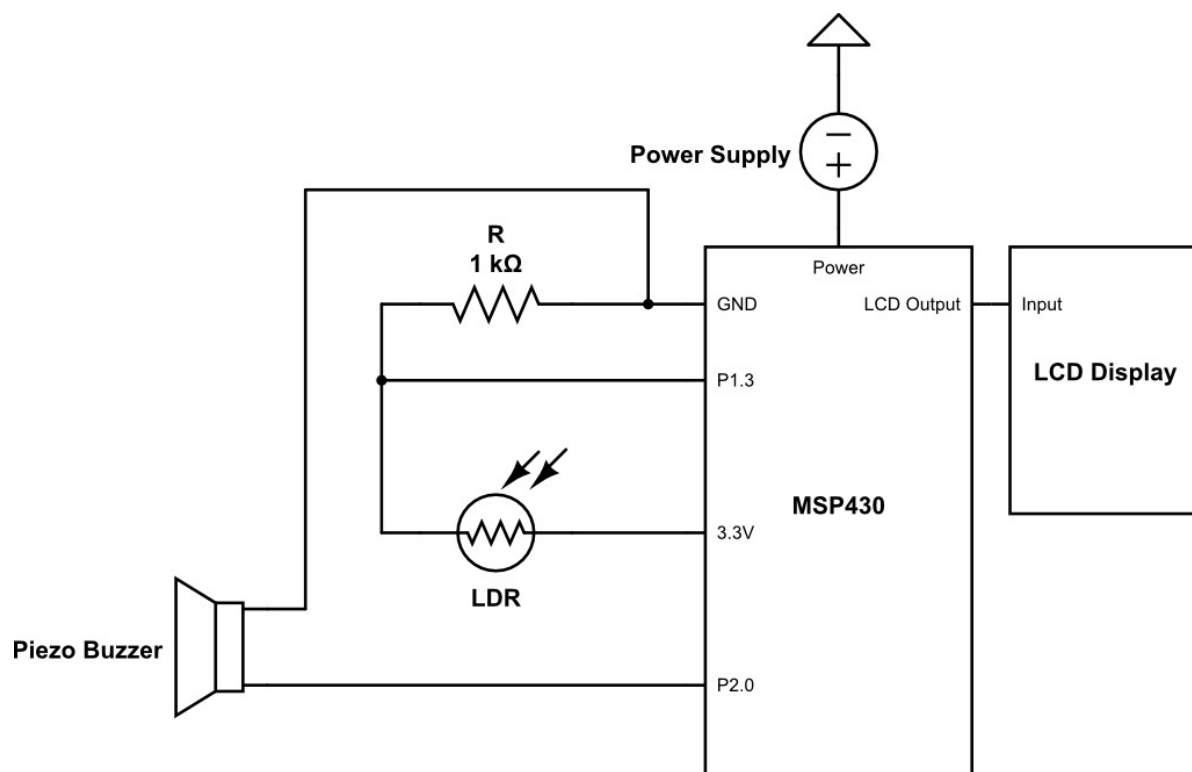
Software Design

Conclusion

I successfully implemented a voltage divider using an LDR and ADC. The LDR is used to dynamically change the voltage between the 3.3V and GND pins with GPIO 1.3, which is tied to the ADC, reading the resulting voltage. The LCD displays the voltage and the Piezo buzzer, connected to GPIO 2.0, outputs a frequency, when it is toggled on, whose pitch is controlled by the voltage divider circuit. All functionalities are implemented.