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ECE 447-203

Lab 8 Report

Introduction

This lab has tasked us with improving upon the previous lab's design. We are to display the voltage from a voltage divider and the temperature from the MSP430's internal temperature sensor; they are both to be displayed on a TFT display using buttons to alternate between displaying one or the other. The voltage divider will made using and LDR and a resistor of any nominal value. The temperature sensor is already built in, so all we need to do is just read it. An additional button was added to allow the user to switch between Fahrenheit and Celsius while reading the temperature.

Microcontroller Concept

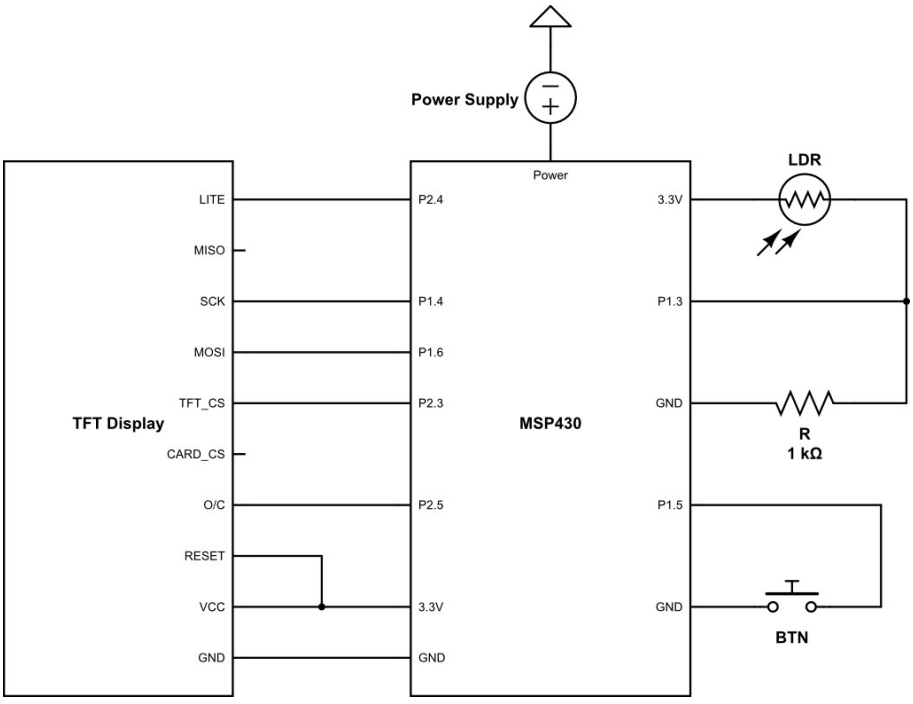
- GPIO 1.3,4,5.6 + 2,3,4,5
- Temperature Sensor
- BTN 2

GPIO 2.4, 1.4, 1.6, 2.3, and 2.5 are used for communicating with the TFT display. These pins are used because it was given to us.
GPIO 1.3 is used for the LDR. This pin is used because the ADC, which is needed to convert the analog signal to digital data, is connected to pin 1.3.
GPIO 1.5 is used for the external button. Any pin would have sufficed; a random pin was selected.

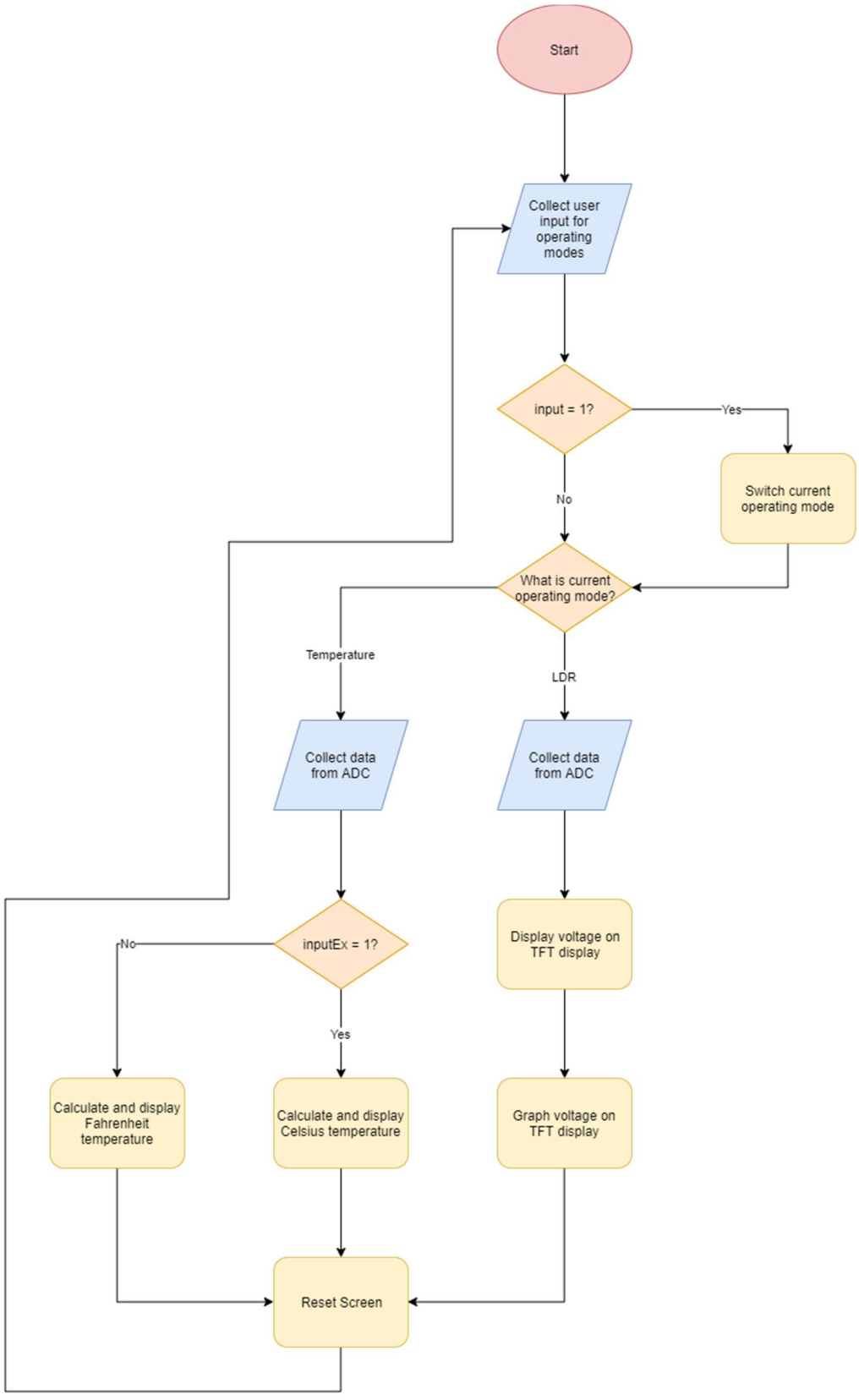
The temperature sensor is used to collect the temperature at given intervals. The ADC is used to convert the analog data into digital.

BTN 2 is used to switch between displaying the LDR voltage and the current temperature. It is used because it is readily available to use.

Hardware Design



Software Design



Conclusion

I successfully implemented a voltage divider and temperature sensor on the TFT display. While the program is in “Vo” mode, the TFT will display the voltage across the LDR and graph it. While the program is in “Te” mode, the TFT display the temperature. The user can press the external button to make the TFT switch between Fahrenheit and Celsius. All functionalities are implemented, including the extra credit.