UNIVERSITY OF ALASKA FAIRBANKS

COLLEGE OF ENGINEERING AND MINES

DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING

COURSE CODE	EE F102 F01 (CRN: 32862)
COURSE NAME	INTRODUCTION TO ELECTRICAL AND COMPUTER ENGINEERING
SEMESTER	SPRING
YEAR	2023
LABORATORY LOCATION	JUB 331 (ELECTRONICS LAB)
LAB SESSION DATE AND TIME	MONDAY 06 MAR 2023
TYPE OF SUBMISSION	LABORATORY REPORT
NUMBER	7
TITLE OF SUBMISSION	ATMOSPHERIC TEMPERATURE DATA LOGGER
METHOD OF SUBMISSION	ONLINE VIA CANVAS
DUE DATE OF SUBMISSION	MONDAY 20 MAR 2023
DUE TIME OF SUBMISSION	23:59
STUDENT NAME	

MAKE THIS FORM A "COVER PAGE" FOR YOUR REPORT SUBMISSION.

FOR THE TA USE ONLY

REMARKS:

ATMOSPHERIC TEMPERATURE DATA LOGGER

Objective

In this laboratory, we will put together all the pieces of our *Atmospheric Temperature Data Logger* and **take data**. This lab is the culmination of the previous laboratory work. At the end of this lab, your lab report should be complete, and will be graded as a comprehensive lab report.

Hardware

Build up the diagram shown in **Figure 1** using your lab kit components (**Lab 4**).
Please note that you only need ***Voltage Regulator*** you created the layout (**Lab 5**) and soldered (**Lab 6**).

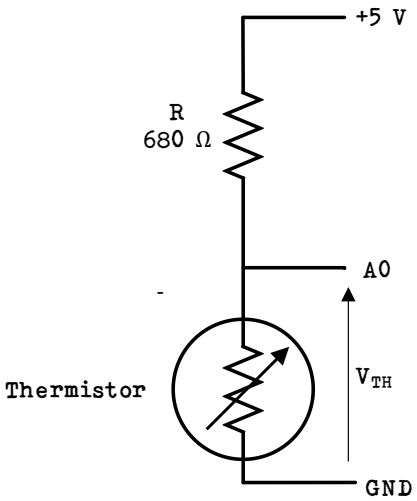

Figure 1. Circuit diagram.

The circuit should be similar to the one shown in **Figure 2**.

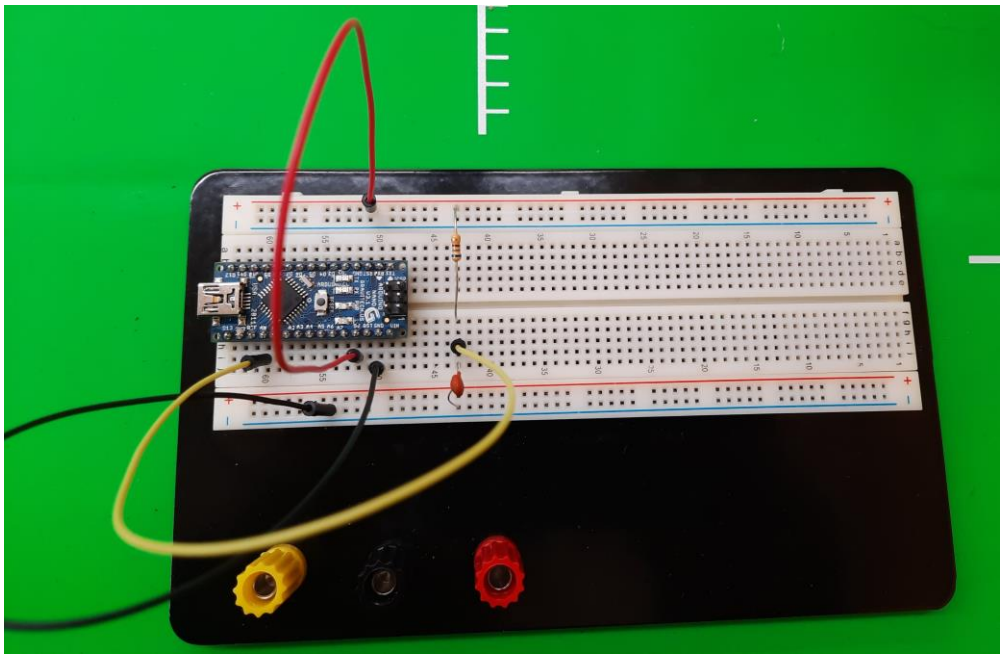

Figure 2. Built circuit.

Software
Download **Processing IDE** from https://processing.org/download/ .
Download **UART_Datalogger.ino** and **UART_Datalogger.pde** files from CANVAS!
The **.ino** file contains the necessary code for the Arduino Nano. You need to modify this file to include the code you wrote in **Lab 4**; *converting the analog input from the Thermistor Circuit into degrees Fahrenheit.* The **.pde** file contains the necessary code for the Processing IDE to log the data to a **.csv** file.

Open **UART_Datalogger.ino** and search for "// THIS IS WHERE YOU NEED TO PUT YOUR CODE FOR CONVERTING FROM ANALOG INPUT TO TEMPERATURE IN DEGREES F".

Modify the code below this line to reflect your code from Lab 4. You should use the variables as given so that additional modifications will not need to be made. If you need additional constants, include them after the line "//INCLUDE WHATEVER CONSTANTS YOU NEED HERE". Upload your revised code to your Arduino and verify that it runs. (You should be able to see temperature in Fahrenheit on the serial monitor). Close the serial monitor and determine which port you are using (COM3/COM4…) , we need this for the next step.

Open the **UART_Datalogger.pde** file. In the line "myPort = new Serial (this, "COM4", 9600);" change the COM port name you determined in the previous step. Run the sketch (**make sure that Arduino serial monitor is closed**). A new file named "**logfile.csv**" will be created automatically on the same folder which contains the **UART_Datalogger.pde**. This **.csv** file contains the temperature values with date and time. While logging the data, do not close the small rectangular window. After collecting the data for **24 hours**, you can close this window and you will be able to open the **.csv file** and view data.

Data Collection
Deploy your datalogger in a location where you intend to collect temperature data at for up to **24 hours**.
Plot the recorded temperature versus time in your lab report.
Provide a discussion of how well you believe your datalogger worked, and if there were any issues with its functionality.

FINAL LAB REPORT
The lab report shall include the following:
(a) **Title Page**: See previous lab reports for content.
(b) **Objective**: Include a statement of the purpose of the lab.
(c) **System Performance and Observation**: include a schematic with a discussion on how you interfaced the thermistor with the Arduino and an equation with a discussion that explains how the Arduino measurements are converted to temperature. There should be a discussion for the plots of the layout and built circuit. Indicate *where* and *when* the data was taken. Decode measurements to retrieve temperature versus time. Provide appropriate equations for decoding the data to temperature and figures. Indicate areas that were difficult with the design process and suggest solutions.
(d) **Conclusion**: Discuss the learning outcome of this lab and what skills you feel that you obtained by performing the lab.