ECE 476/676 - Homework #8

Text Files, Temperature Sensors - Due Monday, October 27th

How Much Cooler is a Wet Towel?

Determine how much cooling you get by blowing air over a wet towel.

Software

1) Write a Python program which

- Waits until you press GP15 (start of data collection)
- Once pressed, it waits 5 seconds then beeps and starts collecting data
  - Data consists of temperature readings from a DS18B20 sensor
  - One data point every 100ms
  - For 20 seconds (200 data points)
  - Data is saved as a text file on your Pico board
  - Different names for each data run
- After 10 seconds (100 data points), it beeps again
- After 20 seconds (200 data points), it stops collecting data

Data Collection

2) Measure the temperature of a wet towel

- Soak a towel in cold water than squeeze it to dry
- Place the a DS18B20 sensor on/in the towel
- Start data collection (press GP15)
- Wait for the first beep (at 5 seconds: data collection starts)
- At second beep, start blowing air over the towel and sensor
  - Turn on a fan
  - Wave a fan over the towel
- Wait for the third beep (data collection is done)

Plot the raw data

- Display as a graph rather than 200 numbers

3) Repeat three times noting

- The temperature at 10 seconds for each run
- The temperature at 20 seconds for each run
- The temperaure drop due to cooling

Data Analysis

4) Use a student t-test to determine the 90% confidence interval for how much cooling you get from blowing air over a wet towel.