

Hydroinformatics

Assignment 2

Datalogger Programming and Data Collection

Due Date: September 29 (electronic copy in Canvas and hard copy for grading submitted before class starts)

Learning Objectives

1. Determine the dimensionality of a dataset, including the scale triplet of support, spacing, and extent
2. Create basic programs for data collection using dataloggers and environmental sensors

Computer and Data Requirements

1. The Arduino Interactive Development Environment (IDE) for writing Arduino sketches is available for download for Windows, Mac, and Linux at:
<https://www.arduino.cc/en/Main/Software>
2. Complete wiring instructions and diagrams for the Arduino, MicroSD Card Breakout board, and the temperature and relative humidity sensor are provided in the lecture materials
3. Example Arduino sketches were provided with the lecture materials

The Problem

Develop a fully functional data logging sketch for your Arduino Uno and the temperature/relative humidity sensor in your kit. The example sketches that we provided in class show examples of all of the component pieces you need, but you need to put them all together into a functional sketch. Once you have a working sketch, do the following:

1. Select an interesting environment within which to deploy your logger and sensor to collect data.
2. Select an appropriate scanning and recording interval for data collection that is consistent with the conditions you are measuring.
3. Deploy your datalogger and sensor to your selected environment and collect data for a period of at least one full day. You may power your sensor from the provided AC power supply or from the 9V battery adapter in your kit. Both plug into the barrel adapter on the Arduino. Depending on the environment you choose, you may also need to come up with a way to protect your datalogger from the environment in which it is deployed.
4. Download the data from the MicroSD card to your computer. Then, using the data visualization/analysis environment of your choice, produce one or more visualizations (plots) and/or summary tables of the data you collected. You may also want to take a photo of your deployment.
5. Write a 1-page summary of your work that describes the data you collected. Your visualization(s) or tables may be included as an appendix to your 1-page write-up. You should cover the following in your write-up:
 - a. What is the environment you chose measure and why?
 - b. What scanning and recording intervals did you select and why? Were they appropriate for your selected environment?
 - c. What is the time support, spacing, and extent of the data you collected?
 - d. What do the data show about the environment you measured (e.g., discuss the visualization(s) of the data you develop)? What did you learn from the data?

Deliverable

Submit a one-page report that addresses the above questions and includes your data visualization(s), tables, photos, etc. as an appendix. Additionally, submit the Arduino sketch that you developed (the .ino file) **as an electronic file** upload to Canvas.