Temperature and Humidity Sensor Capstone Project Proposal

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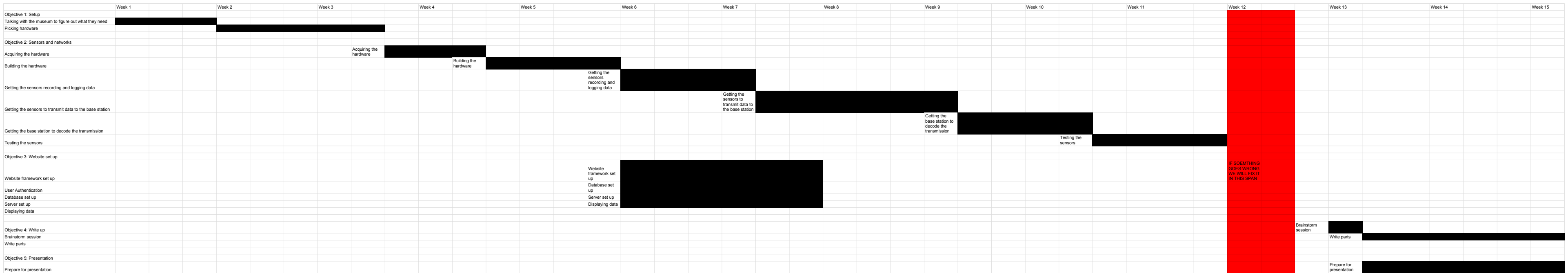
1. Our project will consist of creating a network of battery powered temperature and humidity sensors that transmit their data to a powered base station. The sensors will need to be low powered enough that they can run on batteries for a reasonable amount of time (>1 month?). They will need to then be able to transmit their information over a low powered network (radio?) to a base station that will display the data on the web.
2. Challenges
    a. Hardware: We will need to learn about the different hardware components that our project will use. Sensors, batteries, and small computers.
    b. Software: We will need to learn about the different softwares that will be running on our sensors and base station. Likewise, we will need to learn about ways to display the information on the web.
    c. Networks: We will need to learn about the networking protocols involved so that the data from the sensors can be transmitted back to the base station.
    d. Calibration: Do our sensors even work? We will need to spend time testing to make sure our data is accurate.
    e. Testing: We will need to test how long the batteries are going to last. We will need to test our code thoroughly so that it is stable enough that no one will never have to touch it again.
3. This project will, at the minimum, be able to measure humidity and temperature levels in each of the cases at the museum, and transmit that data to some base station. Users can then interact with a simple one page website to view the data. Some stretch goals are listed below:

Stretch Goals

- Data visualization
    - Graphs
    - Special Metrics (e.g. # “bad” days in a year)
- Other measurements
    - UV Light Sensors
    - Air Pollutant Detectors
    - Acid/Oils sensors (is this even possible?)
- Hardware alert systems (e.g. warning lights)
- Making the system stable. For example, when the battery on a sensor dies you can just connect a new battery and click a “reset” button that gets everything working.
- Error logging/ notifications about dead sensors or batteries.
- Notification emails about temperatures and humidities out of the normal range
- The ability to easily connect new sensors to the network.


Week 1
Week 2
Week 3
Week 4
Week 5
Week 6
Week 7
Week 8
Week 9
Week 10
Week 11
Week 12
Week 13
Week 14
Week 15
Objective 1: Setup
Talking with the museum to figure out what they need
Picking hardware
Objective 2: Sensors and networks
Acquiring the hardware
Building the hardware
Getting the sensors recording and logging data
Getting the sensors to transmit data to the base station
Getting the base station to decode the transmission
Testing the sensors
Objective 3: Website set up
Website framework set up
User Authentication
Database set up
Server set up
Displaying data
Objective 4: Write up
Brainstorm session
Write parts
Objective 5: Presentation
Prepare for presentation
Acquiring the hardware
Building the hardware
Getting the sensors recording and logging data
Getting the sensors to transmit data to the base station
Getting the base station to decode the transmission
Testing the sensors
Website framework set up
Database set up
Server set up
Displaying data
IF SOEMTHING GOES WRONG WE WILL FIX IT IN THIS SPAN
Brainstorm session
Write parts
Prepare for presentation