

# Milestone 2

Team: Guugle

## [Milestone 2 Instructions](#)

## Team Roles

- Yu-Shen: Hardware
- Andrea: Database
- Lucas: Front-end/integration
- Kai: Back-end
- Matt: Front-end/Debugger

## Hardware and User Requirements

### Requirements:

- **Integrated Development Environments (IDE)**
  - POSTGRES and Heroku for database
  - MySQL workbase for data models
  - Code Composer Studios for hardware programming
  - Raspian or Arduino IDE
  - Eclipse
- **Hardware Components:**
  - MSP432 Microcontroller and/or Arduino Uno R3 and/or Raspberry PI 3
  - RC car chassis
  - Bluetooth Modem - BlueSMiRF Silver
  - Breadboard
  - Capacitors, Resistors, and Diodes
  - Motor Driver - Dual TB6612FNG (1A)
  - One-Wire Ambient Temperature Sensor - MAX31820
- **User Requirements:** Using this application and device, this project is a prototype for an autonomous rover device that can amass data from an unknown room or area. It displays this data on a webapp in the form of a graph. This project can be useful in application of exploration. It can travel to unknown regions and collect temperature data on that region. This could be used in caves, abandoned structures, or the vast depths of space or sea to visualize temperature patterns in an area.
  - **Functional Requirements:**
    - Autonomous functionality using ultrasonic sensors
    - Collects temperature data from an external sensor
    - Hardware runs completely on embedded C code

- External bluetooth device to transmit temperature sensor to a computer
  - PostgreSQL for database storage of temperature data
  - Website written in HTML and CSS to display collected data in the form of a graph
  - Collected temperature data will be formatted into a graph on a web app
  - Mapped out space that rover traverses over given time, and values of temperature added in
  - Streamlined functionality between user end, databases, and the rover itself
  - Automatic refresh every so often (ei. 10 sec)
- **Non-Functional Requirements:**
    - Hard reset button
    - Product is to be used as a prototype rover that collects data from unknown regions.
    - Product has low weight capacity
    - Operates mainly on flat surfaces
    - Real time data accessibility
    - Present data within a reasonable amount of time

## Three Week Sprint Plan

Out project will take all 10 weeks to finish. (End-date: December 17, 2018)

### Week 1 (10/8-10/14)

- Discuss and plan out circuit design for microcontroller interface
  - Get all required hardware components:
    - Resistors, capacitors, diodes, jumper wires, header pins, bluetooth module, microcontroller, battery pack, dc motors, and breadboard.
  - Calculate parameter values for circuit design:
    - Must determine values for resistance, capacitance, currents, voltages, and power.
  - Create Block Diagram for hardware components
- Discuss and plan out software design process
  - Gather information on the software platforms to be utilized
  - Plan out website structure
    - Plan out the back-end and front-end of web application
  - Decide on features of the web app
- Discuss and plan out database design
- Conduct an overall week 1 agile standup meeting review

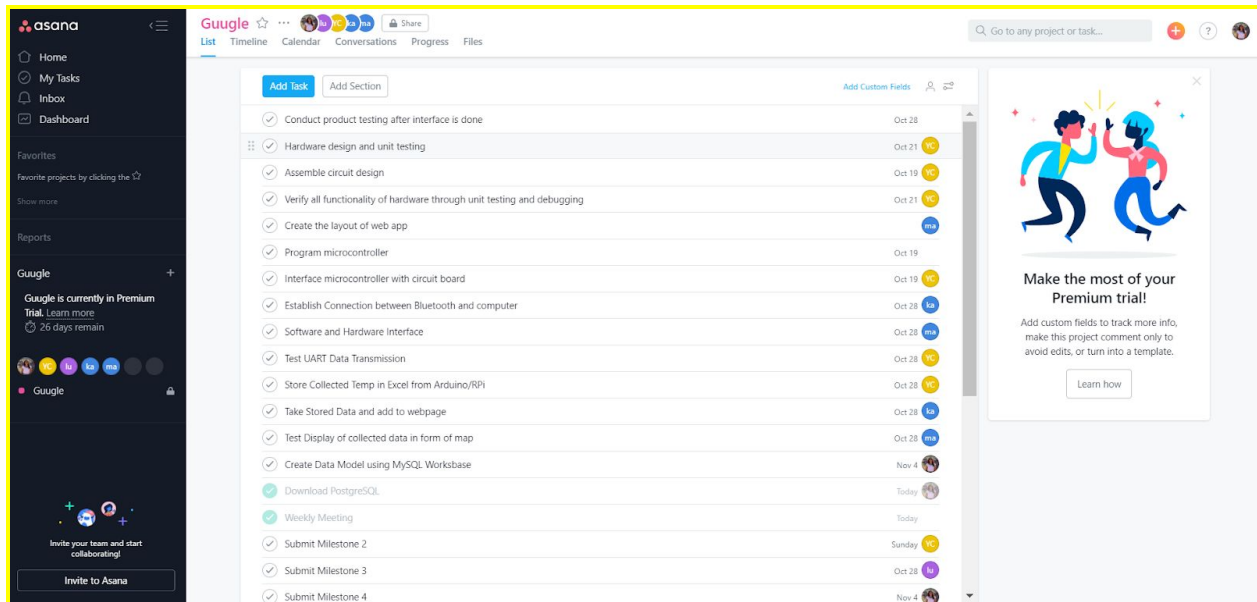
### Week 2 (10/15- 10/21)

- Hardware design and unit testing
  - Assemble circuit design
  - Program microcontroller
  - Interface microcontroller with circuit board
  - Verify all functionality of hardware through unit testing and debugging
- Create the layout of web app
  - Begin design and programming for web app
  - Program the layout of front-end and back-end of web application
    - Front-end to focus on how to use collected data and display it on web application for users
    - Back-end to focus on getting the database information on web application
    - Database role to design the database:
      - Create a Database Model using MySQL workspace
    - Figure Out Meeting Logs- Matt and Send- Kai
- Conduct an overall week 2 standup meeting review
- Weekly Meeting

### **Week 3 (10/22-10/28)**

- Hardware and software interface for prototype
  - Must establish connection between computer and microcontroller via bluetooth
  - Test UART data transmission between microcontroller and computer
  - Store collected temperature data into excel sheet from Arduino or Raspian IDE
  - Back-end will take stored data and upload it to webpage
  - Front-end will test display of the collected data in the form of a map on the web application
- Conduct overall project testing of prototype once interface between hardware and software is complete
- Weekly Meeting

# Project Dashboard



## Project Timeline PDF

Please follow the links below:

- [Calendar-view-week3-sprint](#)
- [timeline-view-week3-sprint](#)

## Agile Standup Meeting

**Kai**

1. What have you completed since the last meeting,
  - Contributed to the Milestone 2 Writeup
2. What will you complete before the next meeting,
  - I will begin to create a skeleton back end file series, along with learning more SQL
3. Describe any obstacles or roadblocks you face.
  - I don't know much of SQL or Java, but some *agile* learning will quickly catch me up to speed.

**Andrea**

1. What have you completed since the last meeting,
  - Milestone 2, Made an Asana Workspace for everyone, Downloaded PostgresSQL
2. What will you complete before the next meeting,
  - Plan out database design by making a Database model using MySQL Workbase
3. Describe any obstacles or roadblocks you face.
  - I believe collaboration is potentially a road block.

**Matt**

1. What have you completed since the last meeting,
  - I have familiarized with html
  - Experimented with web app design
  - Written out goals for myself
2. What will you complete before the next meeting,
  - I will have a design for the app
  - I will have a very primitive version coded
  - I will confer with Yushen about how we are linking the app to the car
3. Describe any obstacles or roadblocks you face.
  - I am definitely unfamiliar with the hardware
  - Collaborating on design is always hard.

#### **Yu-Shen**

1. What have you completed since the last meeting,
  - I have gathered all hardware components needed for the project.
  - I have planned out the software to be implemented for hardware design.
  - I have also came up with a plan to extract data into the database from hardware.
  - I have created and planned out the 3 week sprint.
2. What will you complete before the next meeting,
  - I will interface the microcontroller with the designed circuit.
  - I will begin coding the hardware.
  - I will test out all hardware components to verify they all function
3. Describe any obstacles or roadblocks you face.
  - I believe collaboration may be the most challenging aspect of this project.

#### **Lucas**

1. What have you completed since the last meeting,
  - Contributed to Milestone 2 .
  - Assisted in setting up project management tools for group.
2. What will you complete before the next meeting,
  - Familiarize myself with the interface protocols to connect all layers of our app
  - Assist Matt with the front end Skeleton Design
  - Assist Kai with Backend architecture
3. Describe any obstacles or roadblocks you face.
  - I am not familiar with hardware components of project
  - I am not familiar with connecting all levels of our planned application (SQL, back end, front end, hardware)
  - I have not worked in a large group on a coding project before.

## Meeting Reflection

Overall we had a very productive meeting. Although Yushen was not here, he contributed a ton to the milestone document, so it was not a big deal. Everyone else showed up relatively on time and we got a lot of things done. Everyone has been assigned a task in the overall project and now knows their role. In the future we could have a more structured meeting to improve productivity. We need to do a better job of getting on top of sprint tasks earlier for the next sprint. We admittedly did a lot of them last minute for this one, but we have taken note.