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MySQL Database:

The database is a standard MySQL database hosted on a database provider. The website is freesqldatabase.com. The database is currently operating on a 1 year subscription initiated in February 2023, and can be extended accordingly. The specifications required to establish a connection are listed below:

> Hostname: sql9.freemysqlhosting.net
> Port: 3306
> Username: sql9596235
> DBName: sql9596235
> Password: 7LCYhZVIwK

In testing, I used MySQL Workbench to submit queries manually and to use it as an easy way to view the table data. The database consists of three tables: tracked_sensors, control, & battery_sensors

tracked_sensors

This table is used to hold 5 fields of data: temperature, pressure, humidity, altitude, and time field names updated_at. Each of the sensor values are stored as a float, and the updated_at field is stored as a MySQL Time field. The time field stores the time of the transmission of the data and is used to track if the system is online or not. Below is the query which can be used to initialize the table:

```
Unset


CREATE TABLE tracked_sensors (
    temperature FLOAT,
    pressure FLOAT,
    humidity FLOAT,
    altitude FLOAT,
    updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE
CURRENT_TIMESTAMP
);
```

control

This table is used to specify the control algorithm which the system is currently operating in, and can be adjusted using the remote dashboard. This table stores 3 fields: manual, schedule, and automatic. Only one of these should store a "1" at a time, and the others will store a zero, so it essentially works as a binary high and low. These values are stored as an Int. Below is the query that can be used to initialize the table:

```
Unset

CREATE TABLE control (
    manual INT,
    schedule INT,
    automatic INT
);
```

Battery_sensors

This table is used to store the battery statistics. They are a number of floats which provide information about the battery for safety purposes. The following code can be used to initialize the database. The main stats it tracks are about the load, battery, and panel.

```
Unset
CREATE TABLE battery_sensors (
  battery_soc FLOAT,
  battery_voltage FLOAT,
  battery_charging_amps FLOAT,
  battery_temperature FLOAT,
  controller_temperature FLOAT,
  load_voltage FLOAT,
  load_amps FLOAT,
  load_watts FLOAT,
  solar_panel_voltage FLOAT,
  solar_panel_amps FLOAT,
  solar_panel_watts FLOAT,
```

```
  updated_at TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE
CURRENT_TIMESTAMP
);
```

Email:

We created an email (Gmail) that is used to register for the account on the database provider. The following are the username and password:

Username: eceseniordesign2023@gmail.com
Password: Minusone123!

In this email, there are references to the database information if needed as well.

Hosting:

The remote dashboard is a web application programmed in PHP, HTML, and CSS. Because of this, the website needs to be hosted somewhere in order for people to use the dashboard. For development of the project, we used Xaamp to locally host the website. Xaamp is free to use and is an application which allows you to turn your local computer into a server to host websites, databases, and other things. In order to view this application at a later date, listed below are the steps to get started with Xaamp:

1. Download and install XAMPP on your computer. XAMPP is available for Windows, Mac, and Linux.
2. Open XAMPP Control Panel and start the Apache and MySQL modules.
3. Create a folder in the htdocs directory of XAMPP. This folder will hold your website files.
4. Place your website files in the folder you just created. Make sure the main file is called index.html or index.php.
5. Open a web browser and go to http://localhost/your_folder_name/. This should display your website.
6. If your website uses a database, you'll need to create a new database in phpMyAdmin and import your database files. To access phpMyAdmin, click on the Admin button for MySQL in XAMPP Control Panel.

7. You may also need to configure your website settings in a configuration file. For example, if your website uses a database, you'll need to update the database connection settings.

The files for the website are located in the Website_final folder on the senior design github. The link for this is listed below:

https://github.com/Wand2843/senior-design-arduino