Project Design and Architecture

Project Overview

After completing some market research around IoT applications our group noticed that there was a gap in the market for a simple web application that has one main function, turning smart lights on and off all while controlling their state. Existing applications in the market are complicated and are not user friendly for example Apple's home app, Philips Hue, Samsung's SmartThings, etc. Therefore, we decided to come up with LightSmart.

LightSmart provides a user with 2 main functionalities. These include:

1. Turning a light on and off from our web application

2. Introducing an automatic mode which makes use of a photoresistor to set the state of the light based on the ambient light in the room

Project Design

For our project we created a simple web application, using Heroku to host the Django code, that allows users to turn on and off their lights. We used the NodeMCU/Arduino as our controller hub, which connects to our LED diode light. The user will enter our web app. From there they will be able to turn on/off the light or turn on automatic mode. Once the user changes the lights state, via web app toggle switch. The NodeMCU/Arduino then makes a GET request from the Heroku API to change the lights state from on/off.

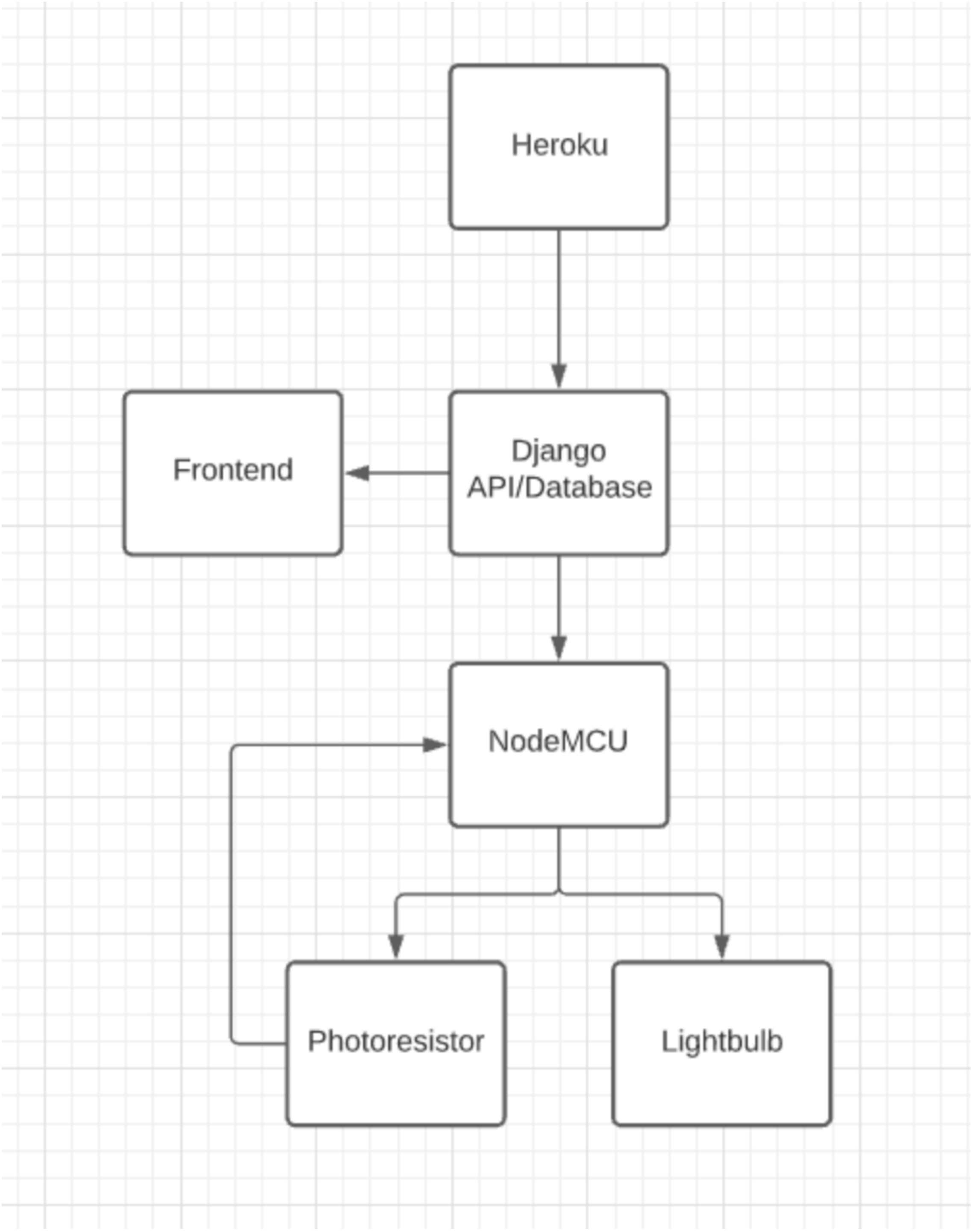
System Architecture

- **Django REST Framework for API/Database**
    - For our API, we used Django to manage and store the light states, as well as the mode, and then serialize and display the data in a JSON format for the API.

- **Heroku to host API and Frontend**
    - Heroku allowed us to host the API on the web so that users can access their light's frontend from virtually anywhere, but also so that the Arduino can make GET requests from anywhere as well.

- **HTML/CSS/JS for Frontend**
    - Since we used Django, we were able to style our Frontend using a combination of HTML/CSS/JS

- **NodeMCU/Arduino as controller for Light and Photoresistor**
    - All the hardware was controller using a NodeMCU that ran Arduino code. This would pull the data from the API and make the necessary changes.


Heroku
Frontend
Django API/Database
NodeMCU
Photoresistor
Lightbulb