Adam Tim

Luke Trinh

Malik Luti

CECS 327 Sec 02

<center>Assignment 8 Group 13 Report</center>

GitHub Repository: https://github.com/01001100Trinh10/CECS327-Assignment-8-group-13

Summary

In our lab, we had to create an end-to-end IoT system using 3 devices with function boards and sensors. We then had to send over the data that we received from the devices into a MongoDB database which stores the metadata and virtual data of each device. From the MongoDB database, we then had to create 3 queries that get the average moisture in the fridge, the average water consumption of a dishwasher, and the device with the most energy consumption. The research that we had to conduct was to research what units we had to use for each sensor. This is because Dataniz doesn't have a preset of measurements so we had to figure out what each sensor had measured. We also had to relearn mongoDB to query each pipeline.

How Dataniz Metadata was used

We utilized the metadata in Dataniz to differentiate between the IoT devices. More specifically, we used the location and name data of the devices to filter and grab from the appropriate devices. We found locations and names satisfactory as we could filter between the three devices. For instance, if we wanted to access the kitchen fridge, we used the fridge name and the kitchen location to filter between fridges as there is exactly one fridge in the kitchen. Dataniz's metadata was crucial in filtering and accessing data from specific IoT devices.

Algorithms used

In our program, we had to pipeline the queries that we used in MongoDB to get the data that we wanted to request. In the first query, we had to get the average moisture in the last 3 hours, and to do this we imported the time function and subtracted the current time by 10800 seconds, which equates to 3 hours and we compared the time in the devices to the last 3 hours. For query 2 we fetched the query the same way but this time we used the metadata with the name "dishwasher" to grab the data of the dishwasher. We then find the average water consumption for each dishwasher cycle. For query 3, we fetched metadata of the queries, then grouped each device and found the average energy consumption of each device. We then sorted the device and then eliminated two devices so that it only shows the device with the most energy consumption.

Challenges faced

The challenges we faced mostly came from inexperience with MongoDB. Both of us haven't used MongoDB for quite some time, but looking up the documentation helped us tackle a lot of additional challenges such as fetching specific units (imperial) and times (PST). Another thing was making sure both VMs in the Google cloud were consistent with each other as both VMs were essentially blank slates that needed matching Python versions/compilers.

Feedback for Dataniz

For Dataniz, there were two issues that we would consistently run into when using the website. One was how picky the values were when creating the sensors. A quick description of what the sensors did to get a better idea of what optimal values look like for the sensors. Also, we didn't understand the use of adding pictures for the sensors.

The second suggestion was for the metadata of deleted devices should stay deleted. There were times when deleted devices were still producing data which would mess with the data of our current devices. We suggest there be a way that devices deleted should also delete metadata more consistently.