EE/CprE/SE 491 Weekly Report 3

10/11/19 - 10/18/19

Group Number sdmay20-23

Project Title: Multi-Context Shopping Optimization

Client & Advisor: Goce Trajcevski, Ashfaq Khokhar

Team Members/Role: Max Garton, Arnoldo Montoya-Gamez, Ethan Shoemaker, Karla Montoya, Jesrik Gomez, Nate Wernimont (team member titles TBD)

Weekly Summary

This week, the team continued to develop individual components of the project. We experimented with the raspberry pi (specifically the use of the GPIO module and HTTP libraries). We decided which parts need to be ordered based on features we need to implement for our project. Some team members experimented with Android application development (creating user interfaces and using the Volley networking libraries). We also further developed recommendation algorithm pseudocode and database schema. Additionally, we finished setting up a containerized NodeJS server in order to start API design and implementation. Overall, the team has made progress developing individual components of the project. We are now ready to order parts from ETG and prototype the hardware component of the inventory sensor module.

Past Week Accomplishments

Accomplishments during the week of 10/11-10/18:

- Experimented with the Raspberry Pi GPIO module and making HTTP requests in Python (Max)
- Determined which parts to order for raspberry pi sensor module (Max and Ethan)
- Experimented with local NodeJS server and Android Volley libraries. Got server to communicate with Mobile Devices through http. (Arnoldo and Karla)
- Polynomial pseudocode for routing algorithm (Nate)
- More complete database schema (Nate)
- Finished setting up basic containerized NodeJS server

Pending Issues

- Max Garton: Waiting on approval from our advisor to order parts with ETG.
- Arnoldo Montoya-Gamez: N/A
- Ethan Shoemaker: Research power supply options, how to set up a “factory” RPi to connect to the user’s WiFi
- Karla Montoya: N/A
- Jesrik Gomez: Need to discuss API design with team
- Nate Wernimont: N/A

Individual Contributions

Arnoldo:

- Created a local NodeJS server on my machine, and connected it to my android phone using HTTP and Volley android libraries.

Ethan:

- Documented different models for data collection system design for in home
    - Sensor -> R/T pair -> sensor hub
    - Sensor -> dedicated micro controller
    - Sensor -> dedicated micro controller -> sensor hub
- Urged communication of progress on Gitlab issue progress
- Compiled a list of items to purchase for prototyping
- Updated and created Gitlab issues for relevant topics of all aspects of project

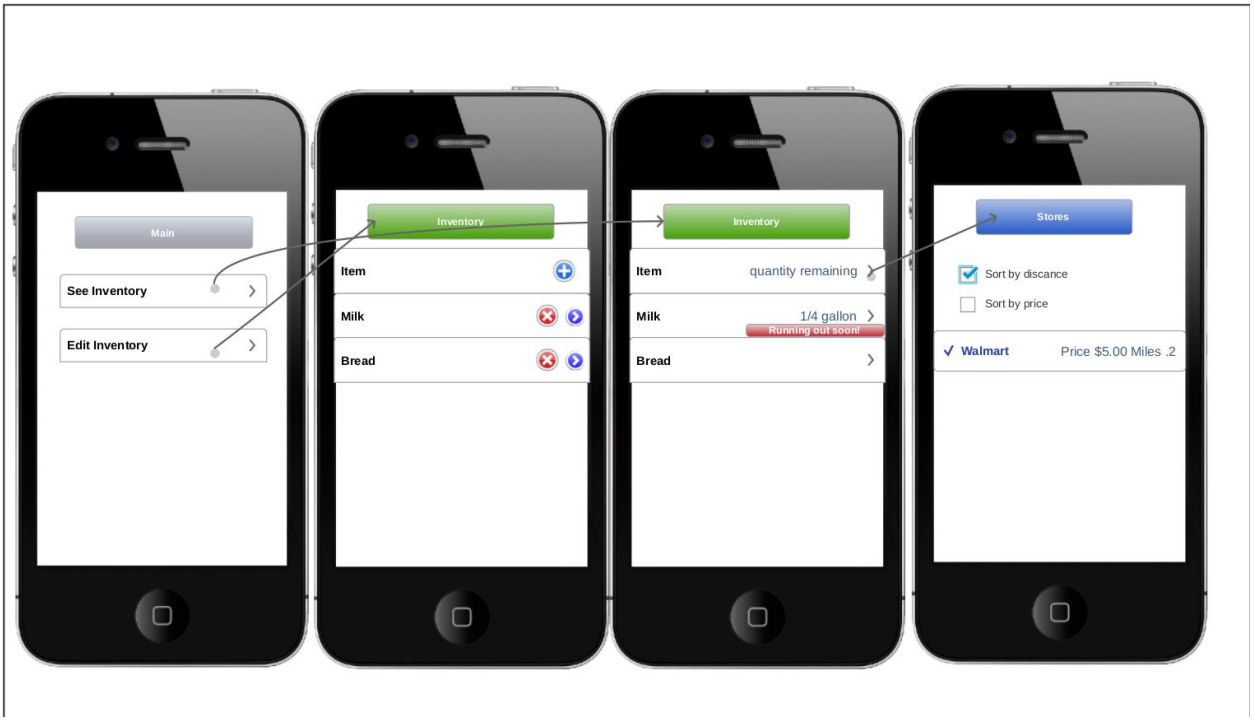
Jesrik:

- Finished setting up containerized NodeJS server
- Need to start discussing API design with team
    - Application

- Sensor
- Data storage

Karla:

- **Did additional Android research on UI and notifications**
  - Finished basic screen sketches.
    Researched
  - Work with SQLite via Room
  - Work with ListView
  - Work with multiple Activities
  - Work with Menus



Max:

- Experimented with Raspberry Pi
  - Set up with Raspbian buster
  - Digital outputs in GPIO using Python
  - Digital inputs in GPIO using Python
  - HTTP Requests in Python
- Determined which parts will be needed for the sensor module
  - Raspberry Pi & Raspberry Pi Zero W
  - Weight sensor
  - ADC (if not built into the weight sensor)
  - Power supplies
  - Cases for microcontrollers

- Documented how to remotely connect to the raspberry pi via SSH
    - Added instructions on how to write a Python script and run it on the raspberry pi

Nate:

- Drafted pseudocode for routing algorithm (determining which stores to get which items from given the user's initial location)
- Iterated on the database schema, added additional tables for physical device metadata

Name	Individual Contributions (Quick list of contributions. This should be short.)	Hours This Week	Cumulative Hours
Arnoldo	Created Lightning Talk Video, Researched Matching Algorithms.	5	22
Ethan	Compiled list of purchase items, mocked up data collection designs	10	20
Jesrik	Finished setting up containerized NodeJS server	3	18
Karla	Sketches, Researched ways to store data	3	19
Max	Raspberry pi GPIO experimentation, documentation on development with the pi	8	30
Nate	Polynomial pseudocode for routing algorithm, iterated on database schema	3	20

Plans for Next Week

- **Arnoldo**: Will create a basic Shopping list app on android phone.
- **Ethan**: Research Python RPi BT libraries for connecting the RPi to the user's WiFi. Discuss data collection options with whole team
- **Nate:** Look at how to retrieve an item's stores and price. Help finalize an API for the servers.
- **Max:** Prototype inventory sensor modules (assuming parts arrive from ETG). Work with Ethan to develop the user flow for connecting the raspberry pi to a user's wifi (via an Android app). Research bluetooth in Android application development.
- **Karla:** Start working on the sequence diagram
- **Jesrik:** Discuss API design, and start API documentation.

Summary of Weekly Adviser Meeting

In this week's meeting (10/17/2019), Goce answered some questions that were not so clear to us, and he helped us understand that the questions will be answered once we are further in

development. We are focused on developing the ground scenario for now (minimum viable product) without worrying about the details until we have reached the minimum functionality. Dr. Goce also helped us come up with a simple scenario for pitching our product that makes sense to any customer. We Discussed the ground scenario, which just means the very basic product and how we will be using the ground scenario to grow our app/product. We left the meeting with a goal of being able to better sell our project to audiences.