Project 7

Project name: Boulder FM - Farmers Market

Team member: Qinglu Sun, Qihang Mao, Yibo Yang

Final State of System Statement

Our final state of the system is using the flutter framework which is programmed in language **Dart** to establish features of the login page where users can login to the application, and the back end is supported by Google Firebase Authentication, login fail notification update. For the login function we have three types of users: Normal User with Email/Password Authentication, login to User page, store User with Email/Password Authentication, login to Store Management Page and guest User where there is no email/password required. For the register function, users can register their account and specify their role (Customer/Store). The data is stored in the Google Firebase Firestore Database. Users need to register with required information instead of empty where the required information includes name, email, phone number, and if Store, the required information also includes the store Name, store type and store hours. The user can login to the application, and the back end is supported by Google Firebase Authentication. If the password is incorrect, the system will send a login fail notification update. When logged in as a customer, users can see all the store's listings, for the customer cart page, customers can see the products they added to their shopping cart. By using the observer pattern, customers can receive notifications from the stores they subscribed to. For the profile page, customers can view and change their information and lastly, for the store home page, the store user can manage their stores where they can add products using the Factory pattern, add news/notifications using the Observer pattern and close store and log-out. Compared with project 5 & 6, we canceled the bill part and the develiver part due to time issues, all the others were successfully implemented as we expected.

- Login Page
    - Users can login to the application, and the back end is supported by Google Firebase Authentication.
    - Users can login as store to add new products, establish a new store and set the new store information
    - Users can login as guests, so they don't have to enter all user information, but their information will not be updated to the database
    - Login fail notification update

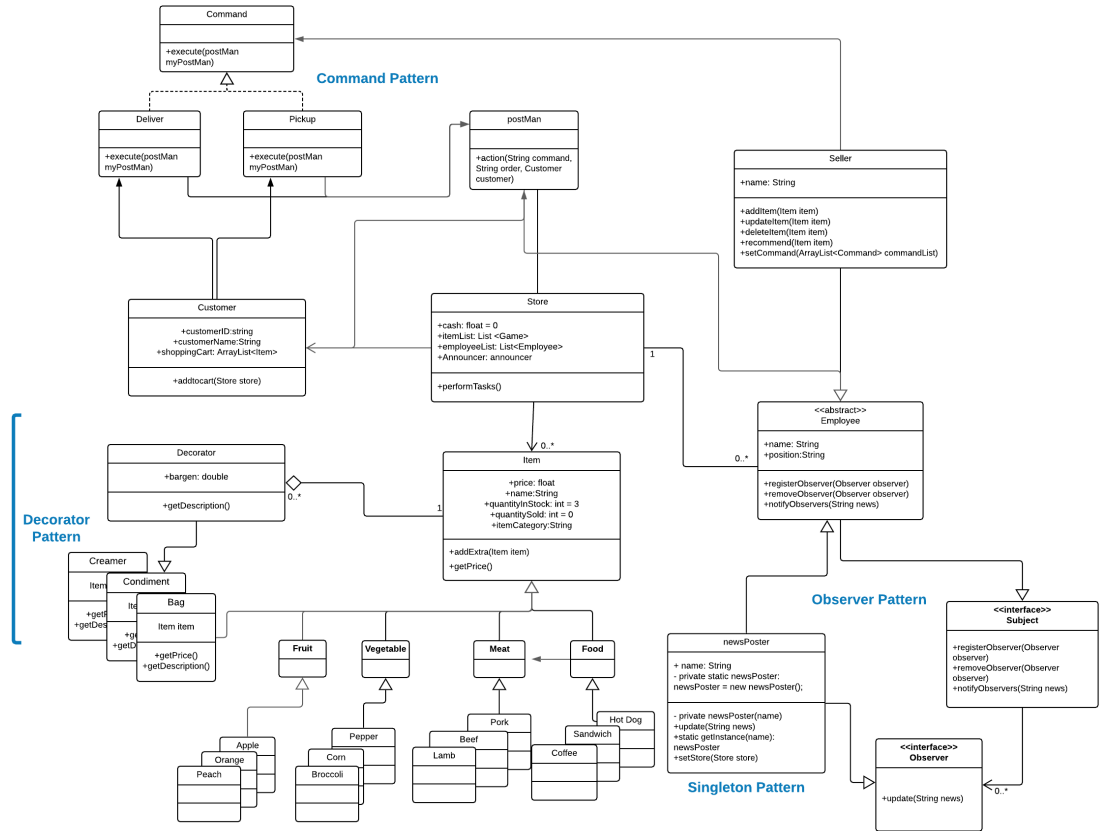
- Customer Home Page
    - When logged in as customer, users can sees all the store's listing
- Customer Cart Page
    - Customers can see the products they added to their shopping cart.
- Notification Page
    - Using Observer Pattern, customers can receive notifications from the stores they subscribed to.
- Profile Page

    - Customers can view and change their information.
- Store Home Page
    - Store User can manage their stores
    - Add Product, using Factory Pattern.
    - Add News, using Observer Pattern
    - Close Store, log-out.

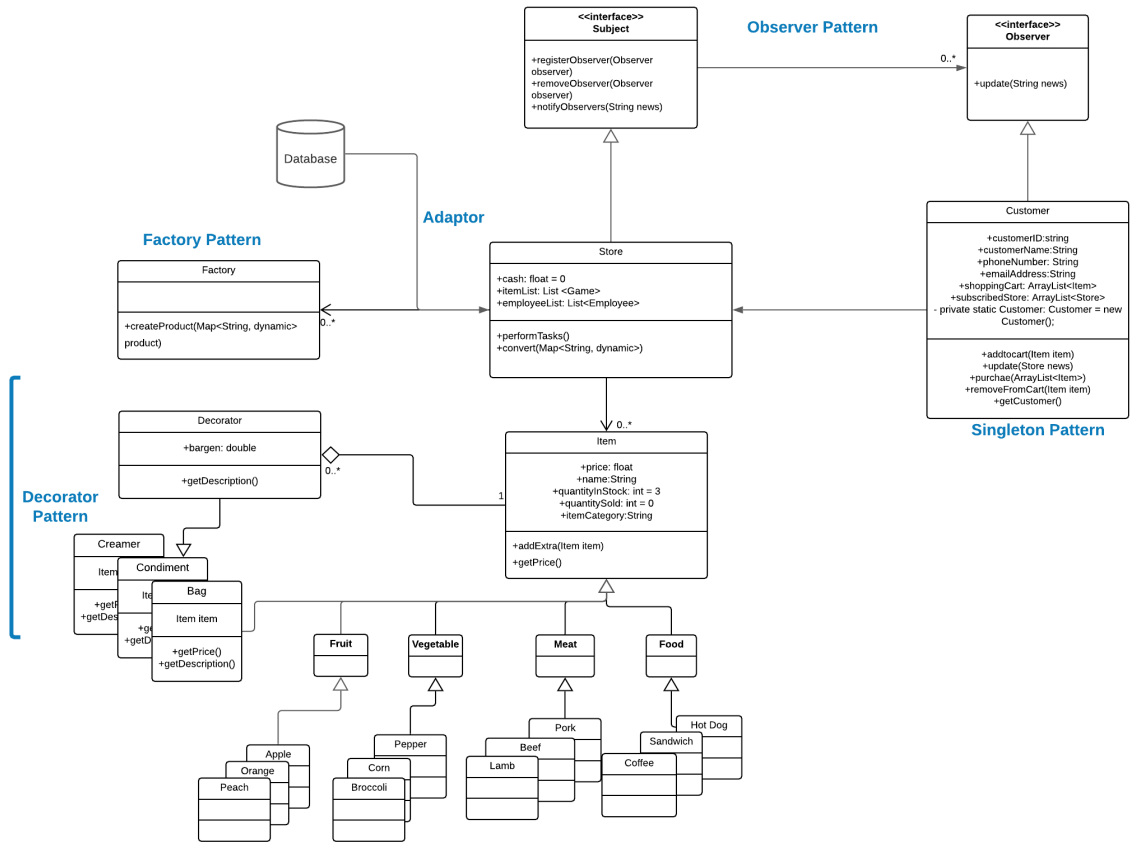
Final Class Diagram and Comparison Statement

- Observer Pattern:
    - Using Observer Pattern, customers can receive notifications from the stores they subscribed to. Stores can post updates to all the customers.
- Singleton Pattern:
    - When Login to the Store page, there should be only one customer at a time when using the app. Therefore, the main app will use Singleton Pattern to get the customer (created within the Customer class). The constructor for the Customer class is private.
- Decorator Pattern:
    - When adding items (like bags) into their cart, customers can choose additional add-ons for the product. The name and price will be adjusted when adding to cart.
- Factory Pattern:
    - When adding products to the store, using Factory Pattern to create the product.
- Adapter Pattern
    - We build an adapter that connects the Cloud FireStore Database with our app then we can use all information stored in the database and updating it based on the needs.

Project 5 diagram:



Project 7 diagram:



Key Changes:

- Adding the adaptor pattern to connect with data stored in the database
- Remove Command Pattern due to time limit.
- Adding Factory Pattern to create product for store
- Improve Observer Pattern and singleton Pattern

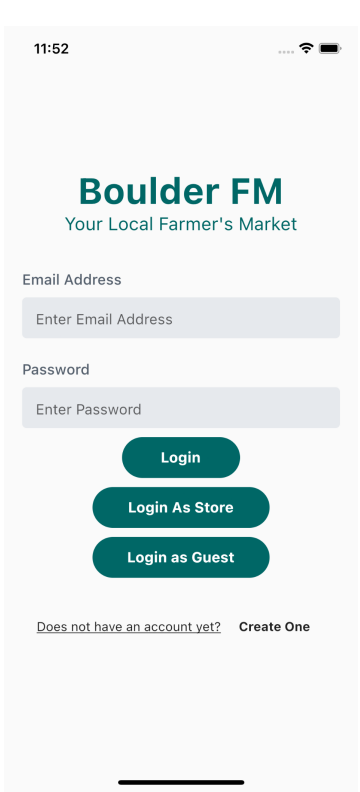
4. Third-Party code vs. original code Statement

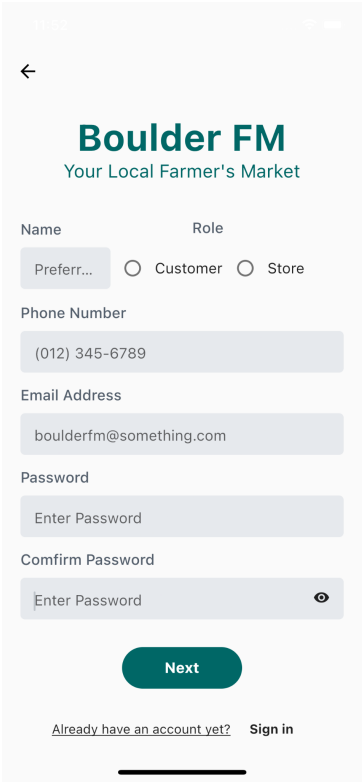
Use Flutter Document for the firebase connection:
https://firebase.flutter.dev/docs/overview
Use some UI Design from, such as Style Sheet, Card Design:
https://github.com/sopheamen007/app.mobile.flutter-foodie-app-ui
Landing Page is inspired by https://github.com/akshayejh/a_commerce:

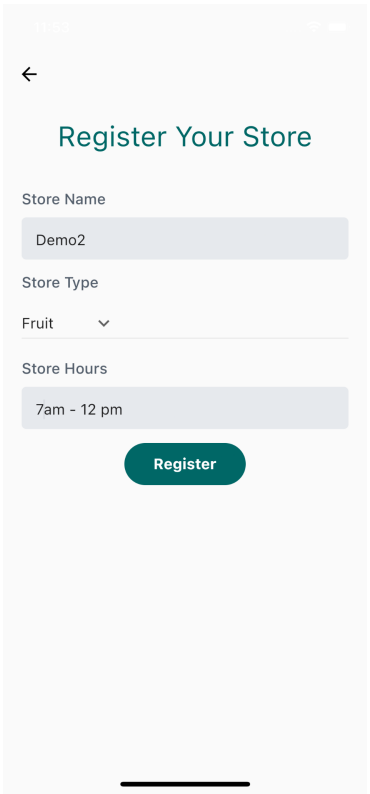
Other parts of the code are original, including all the OO Designs.

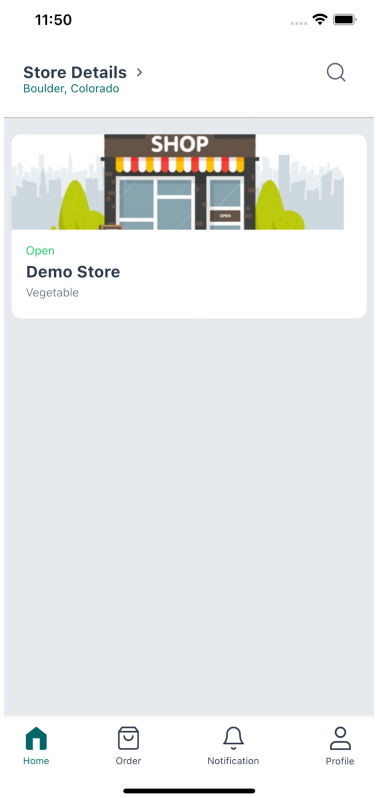
5. Statement on the OOAD process for your overall Semester Project

1. We had no prior knowledge of mobile app development, so it takes a while and a lot of effort to learn the technology (flutter). This is the first time we have used the fluent framework to develop software. We have no experience, so we have taken many detours. We have learned a lot in the process of developing and improving.
2. When connecting to the database, we had a hard time implementing the OO Design Pattern since the data is stored on the cloud and we were not sure how to manipulate the data in the program after retrieving from the cloud. At the end, we used an adapter pattern and also defined some class structures to connect the database and use these data in the application.
3. Positive: We learned a lot designing this app using the elements we learned from class such as UML, State Diagram. It allowed us to write down each function and design the flow before writing codes, which potentially saves us a lot of time rewriting code.


11:52
Boulder FM
Your Local Farmer's Market
Email Address
Enter Email Address
Password
Enter Password
Login
Login As Store
Login as Guest
Does not have an account yet?
Create One


Boulder FM
Your Local Farmer's Market
Name
Role
Preferr...
Customer
Store
Phone Number
(012) 345-6789
Email Address
boulderfm@something.com
Password
Enter Password
Comfirm Password
Enter Password
Next
Already have an account yet?
Sign in


Register Your Store
Store Name
Demo2
Store Type
Fruit
Store Hours
7am - 12 pm
Register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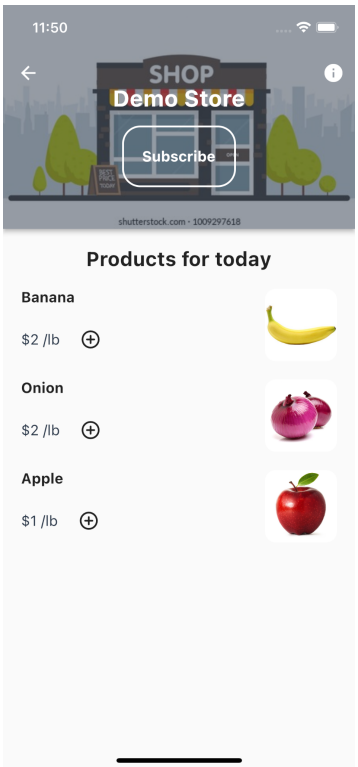
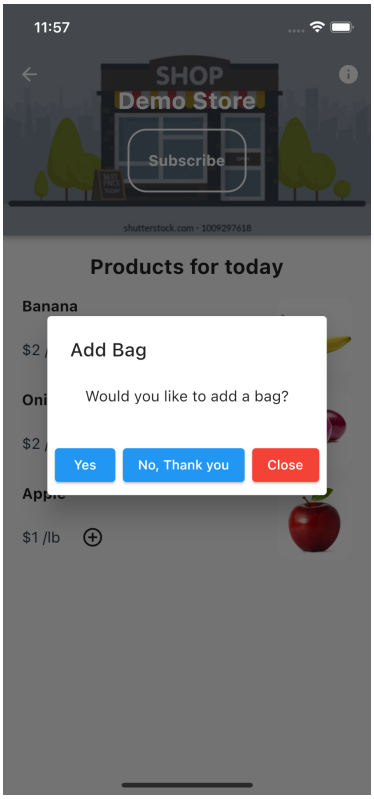
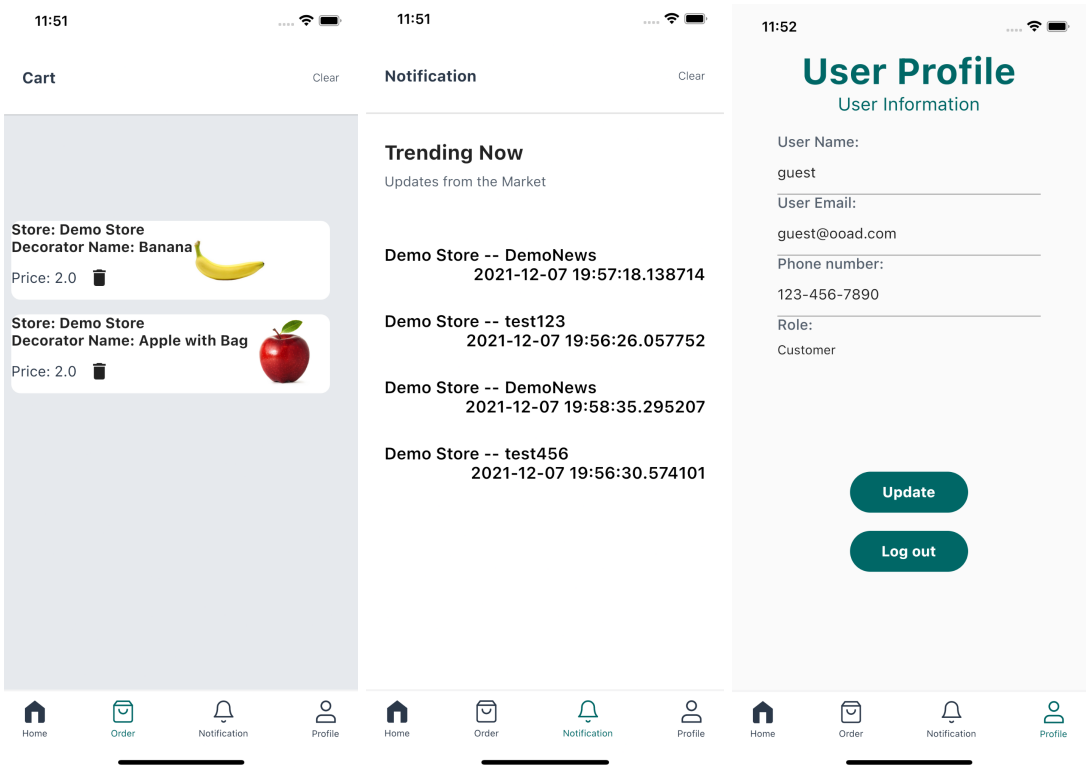
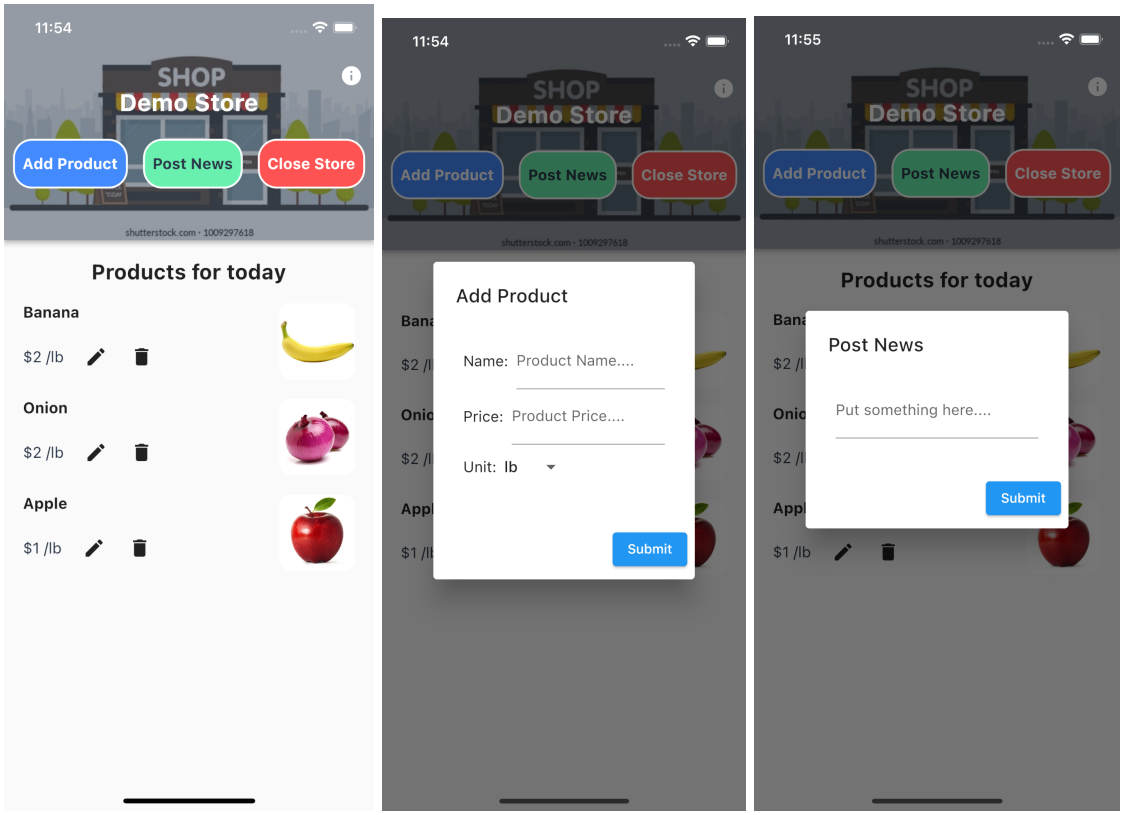
Store Details
Boulder, Colorado
SHOP
Open
Demo Store
Vegetable
Home
Order
Notification
Profile


11:50
SHOP
Demo Store
Subscribe
Products for today
Banana
$2 /lb
Onion
$2 /lb
Apple
$1 /lb


11:57
SHOP
Demo Store
Subscribe
Products for today
Banana
Add Bag
Would you like to add a bag?
Yes
No, Thank you
Close
$1 /lb



Store Management Page: