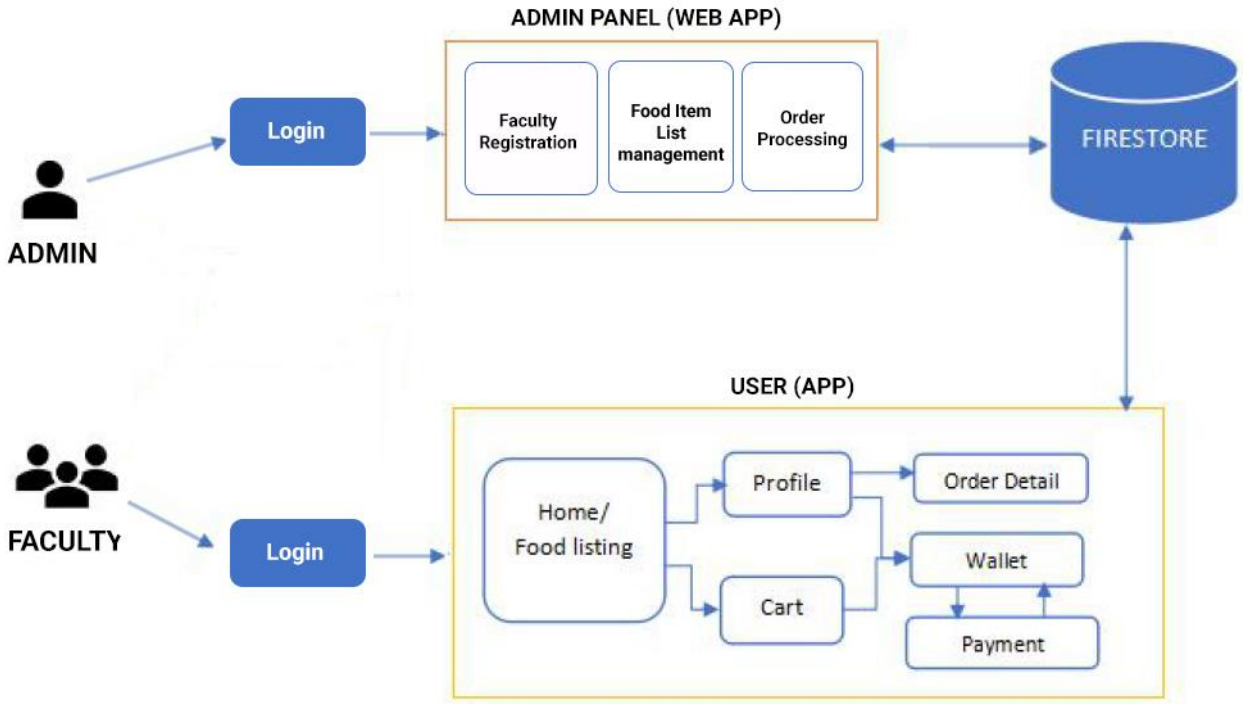
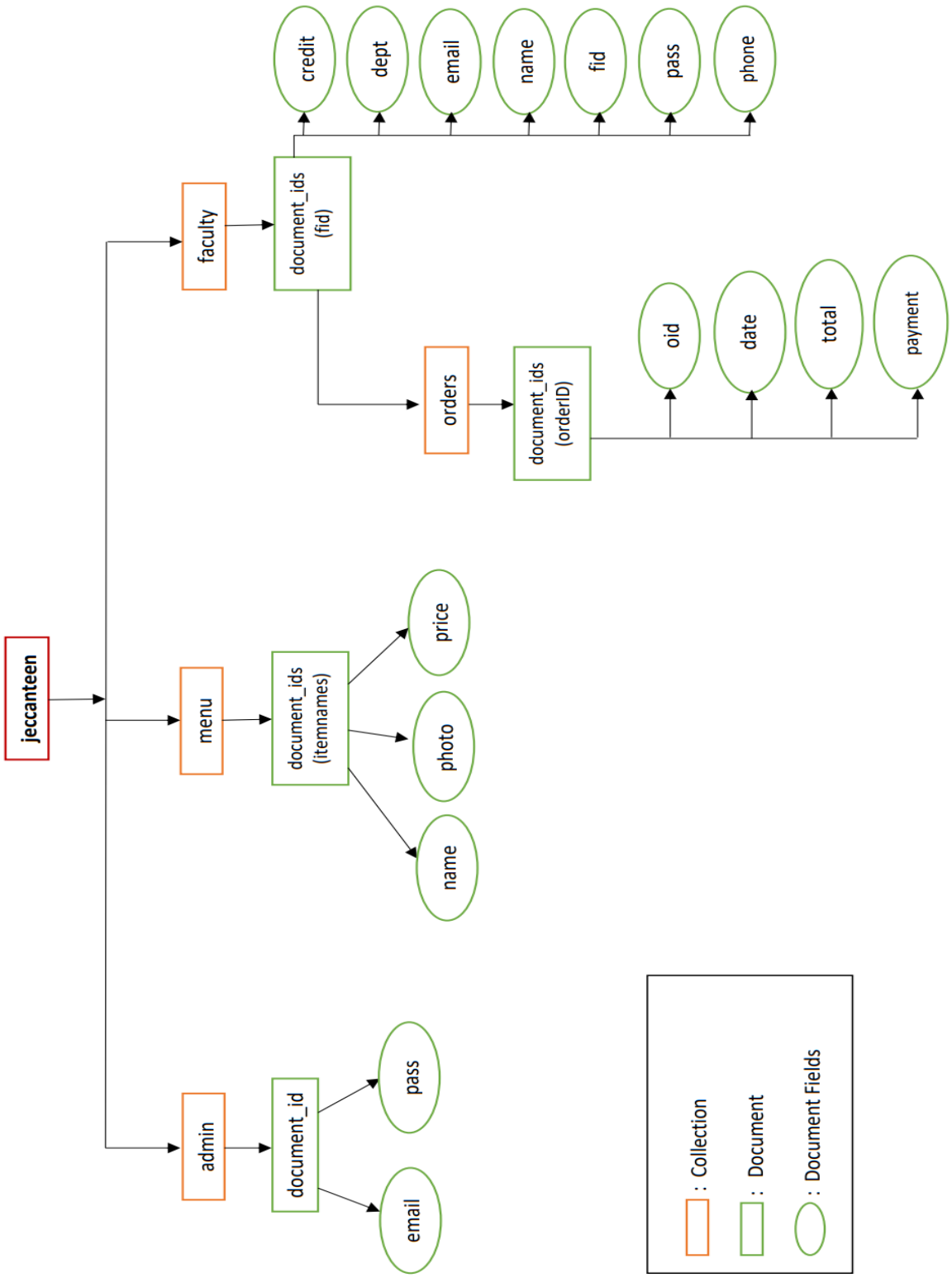
PROJECT ARCHITECTURE:



FIRESTORE DATABASE STRUCTURE:



FIREBASE :

Google Firebase is a Google-backed application development software that enables developers to develop iOS, Android and Web apps. It is also known as Google Cloud Messaging it was developed by Andrew Lee and James Tamplin 26 in 2011.

Firebase provides cloud service, server and real-time backend server. API for the clients also helps to develop high quality applications. Most importantly, Firebase is a **NoSQL** database in which data is stored in a cloud.

When full-fledged application is built, we have to rely on the backend service as well. Therefore, Firebase is a good choice because it saves time and allows us to focus on development. It stores the data in JSON file or JSON objects and we do not need to write any server codes, but it is ready-made API for developing and implementation of applications.

Features of Firebase:

1) **Real-time Database:** It synchronizes the sender´s data to Firebase which updates instantly, and client receives the updated data on real-time on any connected device. It is initialized by the Firebase's initialize () function as used in the Jec Canteen App as below:

```
const app = initializeApp(firebaseConfig);
```

2) **File storage:** Firebase enables the file storage directly from the client to Google's Cloud Storage and syncs across all devices in real time and Data in the cloud is highly protected by Firebase's own security system. It is implemented in the Jec Canteen App as below:

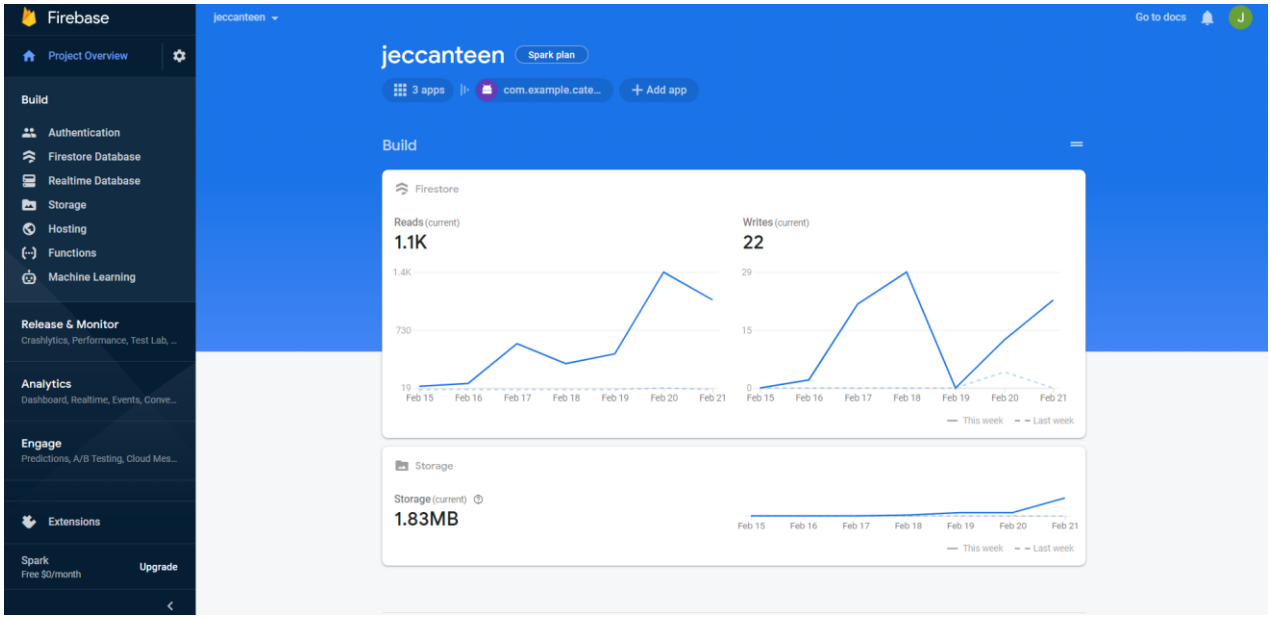
```
const storage = getStorage();

const storageRef = ref(storage, 'images/'+filename);
const uploadTask = uploadBytesResumable(storageRef, file);
```

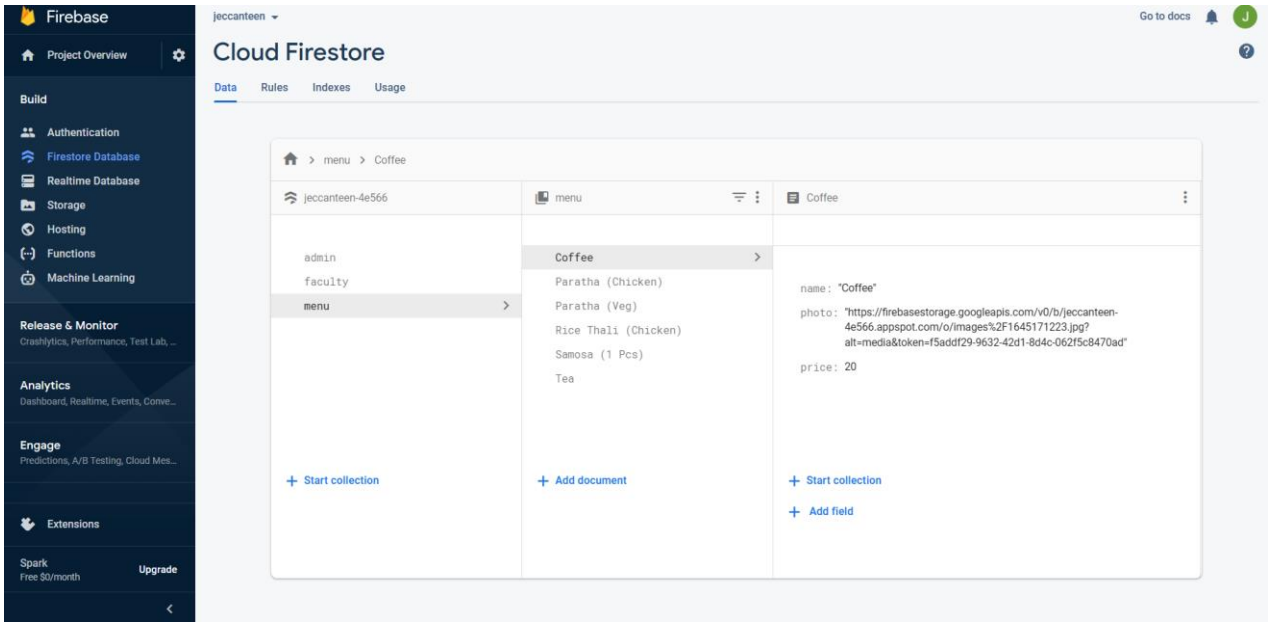
3) **Authentication:** Firebase provides its own pre-built or custom UI authentication or sign-in method either email / password, phone number, google id, Facebook id, yahoo or Apple id.

4) **Hosting service:** Firebase offers the implementation of static websites and single page applications which is built with HTML, CSS and JavaScript. It uses HTTPS and SSL protocols for the security of files and data delivery. It does not require Content Delivery Network (CDN), which is built in function in Firebase.
5) **Free of cost:** Firebase does not require payment for providing databases service to client to some extent. On the other hand, the client has to pay if the database memory is not enough for the specific services.

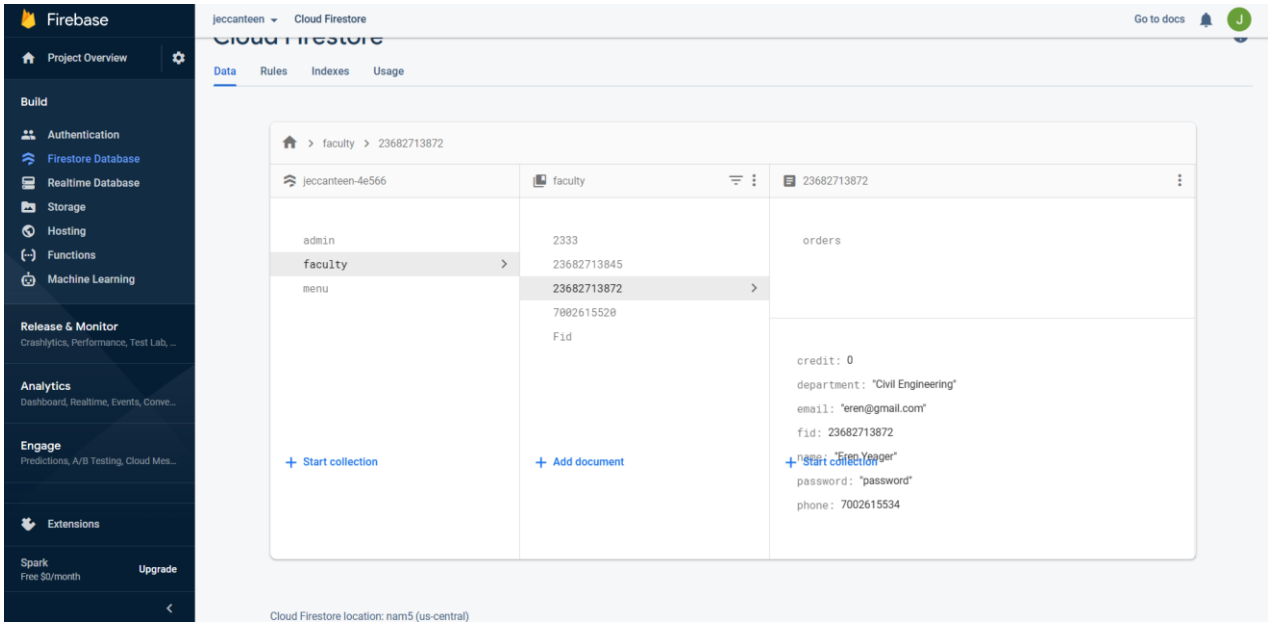
SOME SCREENSHOTS OF THE FIREBASE DASHBOARD:



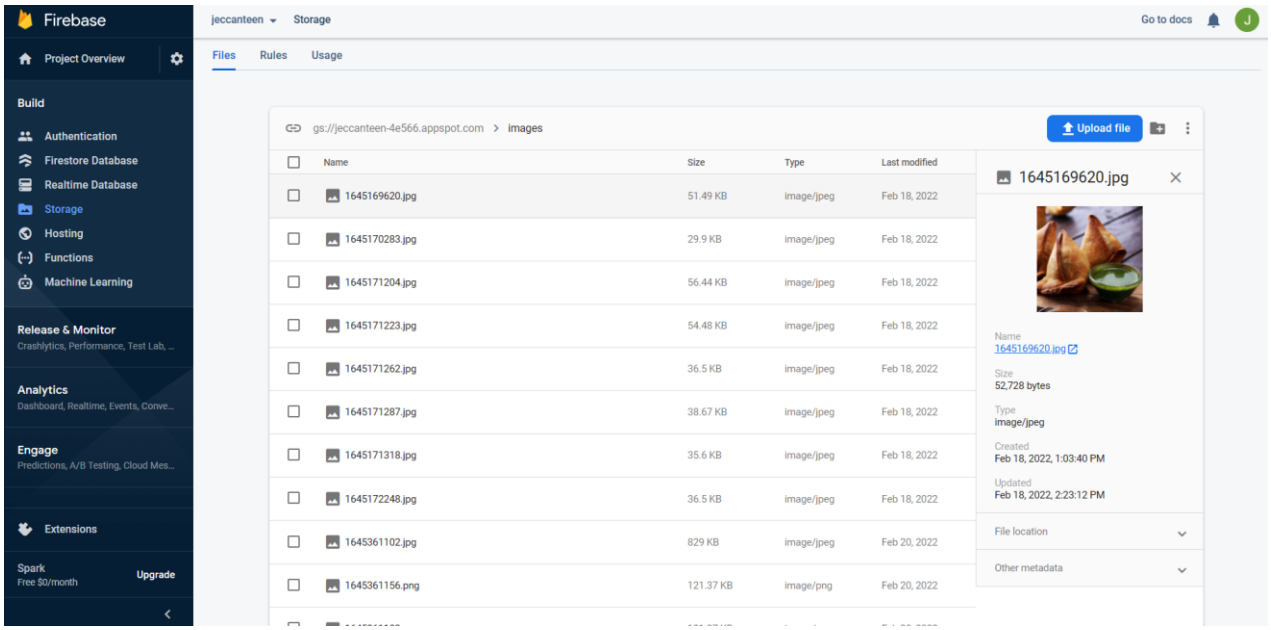
Firebase Dashboard



Cloud Firestore Database of Collection - menu



Cloud Firestore Database of Collection – faculty



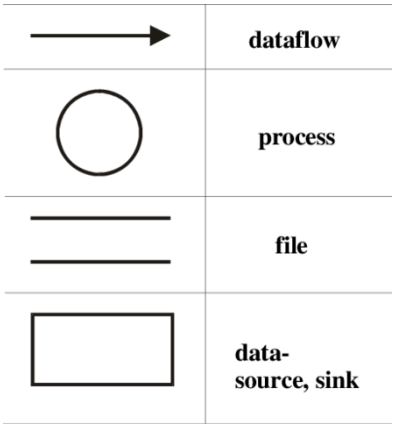
Firebase Cloud Storage for storing files and images

REFERENCES

- docs.flutter.dev
- dart.dev/guides
- firebase.google.com/docs
- w3schools.com
- javatpoint.com
- stackoverflow.com
- github.com
- tutorialspoint.com

DATA FLOW DIAGRAM

A data flow diagram (DFD) maps out the flow of information for any process or system. It uses defined symbols like rectangles, circles and arrows, plus short text labels, to show data inputs, outputs, storage points and the routes between each destination.



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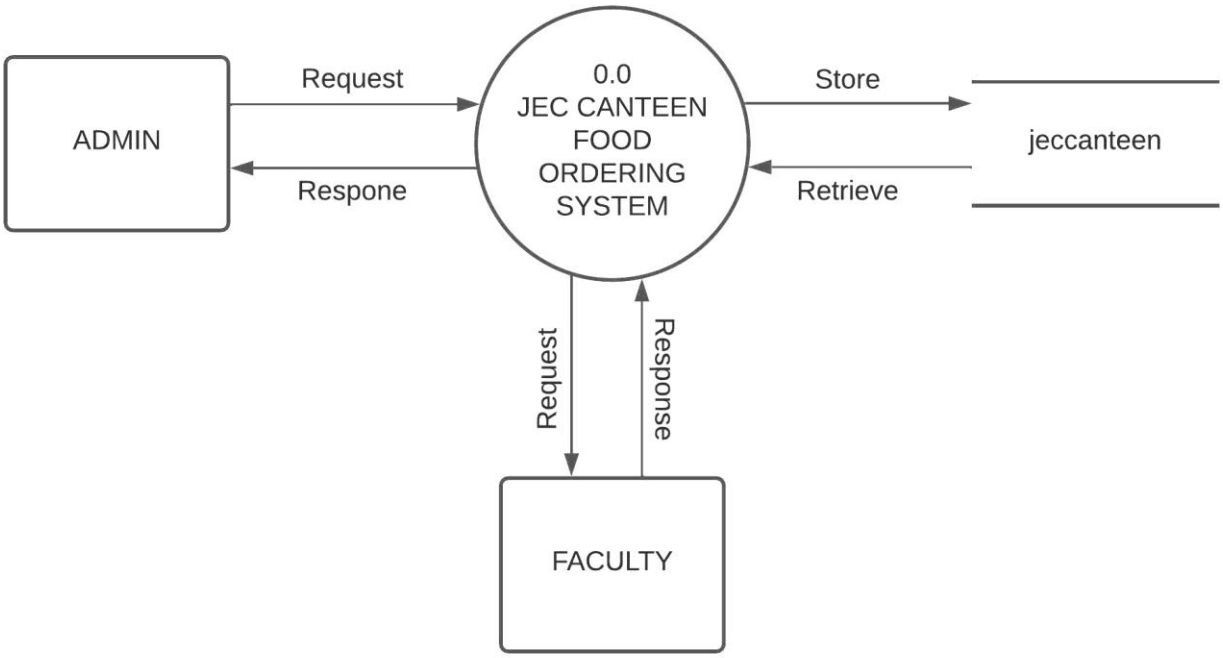
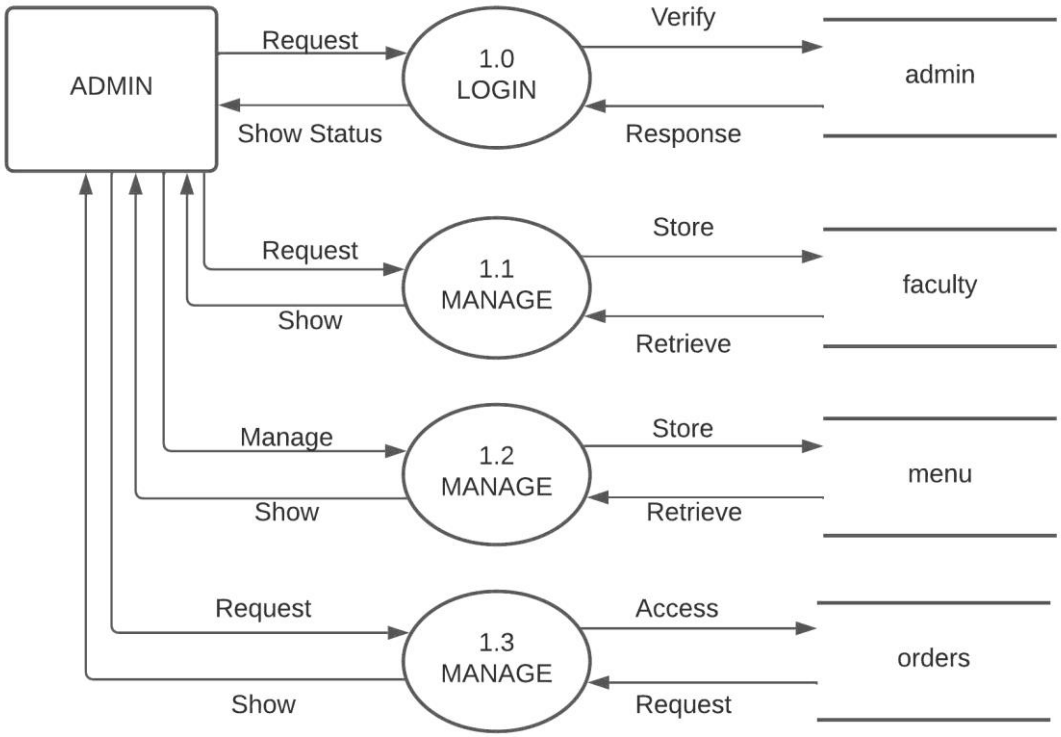
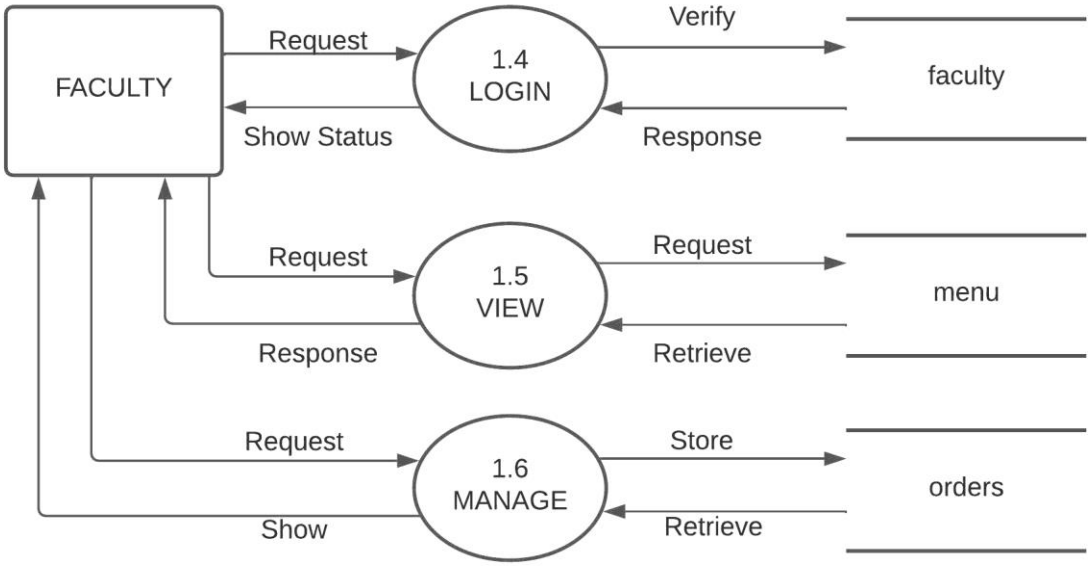


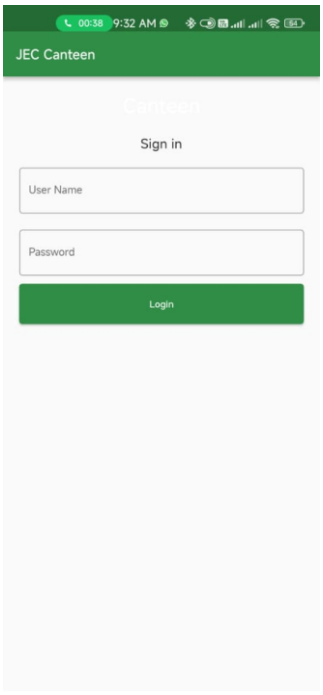
LEVEL 1:

ADMIN:



FACULTY:

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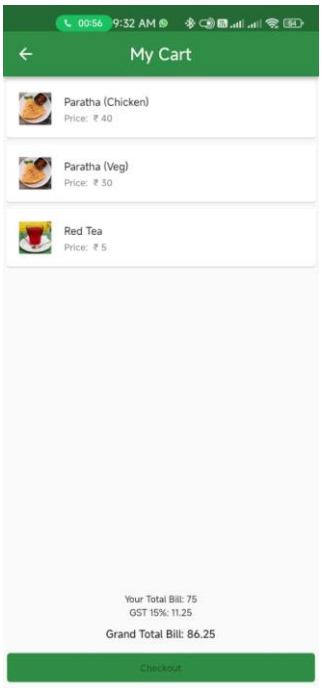
JEC Canteen
Canteen
Sign in
User Name
Password
Login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My Cart
Paratha (Chicken)
Price: ₹ 40
Paratha (Veg)
Price: ₹ 30
Red Tea
Price: ₹ 5
Your Total Bill: 75
GST 15%: 11.25
Grand Total Bill: 86.25
Checkout