# Higher National Diploma in Software Engineering

## Mobile Application Development

## 2023.3F


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**Name of the Program** : Higher National Diploma in Software Engineering

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**Date** : 14/08/2024

## Declaration

We hereby declare that the project entitled "Food Ordering Mobile Application" is an original work carried out by the undersigned and does not incorporate, without acknowledgment, any material previously submitted for a diploma in any institution. To the best of our knowledge, the work presented does not contain any material previously published or written by another person or ourselves, except where due reference is made.

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# PREAMBLE

## Abstract

This report outlines the development of a mobile application designed to facilitate food management for a food delivery shop. The application provides functionalities for both administrators and registered users, enabling efficient order management, user profile maintenance, and data analytics. Key features include user authentication, order customization, local data storage with SQLite, camera access for profile and order images, and Google Map integration for shop locations.

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# 1.Introduction

The Food Management System is a mobile application designed to streamline the food ordering process for customers and enhance administrative capabilities for food delivery shops. This app aims to simplify interactions by offering user-friendly features like browsing menus, customizing orders, and receiving real-time notifications. By ensuring a smooth user experience, the application caters to the growing demand for convenient and efficient food delivery services.

For administrators, the system provides robust tools for managing menu items, tracking orders, and analyzing sales trends, allowing for better operational control and decision-making. The integration of SQLite for local storage ensures efficient data management, while Google Maps integration helps users locate nearby shops easily. Promotional notifications and discount codes further enhance customer engagement and loyalty.

Customers benefit from an intuitive interface that supports user authentication, order history tracking, and profile management, including uploading profile pictures. Email notifications keep users informed of order status, and the use of promotional codes allows for cost savings. Overall, the Food Management System aims to improve customer satisfaction and operational efficiency, making it a valuable asset for modern food delivery businesses.

## 2.System Design

**Architecture Summary**:

The Food Mart mobile application's system architecture is based on a client-server architecture in which the central server acts as an interface that clients can use to make orders, retrieve data and perform user interactions. Moreover, the design has enabled scalability so that processing of transactions can continue even with more users joining. Some of these layers include the user interface layer, business logic layer and data access layer.

The system is designed with the following components:

System Components

1. User Authentication:
    - Registration and login functionality for both users and administrators.
    - Different interfaces for each user role.
2. Order Management:
    - Menu browsing with customization options.
    - Order history for registered users.
3. Database Integration:
    - SQLite database for storing user data, order history, and menu items.
4. Camera Access:
    - Capture images for user profiles.
    - Upload images for customized orders.
5. Google Map Integration:
    - Display shop locations.
    - Suggest nearest branches for users.
6. Email Notifications:
    - Automated emails for order confirmation and updates.

Customer User Interfaces

1. Welcome Page:
    - Introduction to the system with options for first-time users to register and existing users to log in.
2. Register Page:
    - Form for new users to provide their basic information for registration. Provides access to features like order tracking and personalized offers.
3. Login Page:
    - Secure access point for customers and administrators, with options to navigate to the sign-up page if users don't have an account.
4. Menu Page:
    - Users can explore the menu, customize orders, and add items to the cart.
5. Items & Prices:
    - Comprehensive list of items with detailed descriptions and prices, allowing users to make informed choices.
6. Contact Page:
    - Provides contact information for users to reach the admin team with questions or concerns.
7. Food & Branch Ratings Page:
    - Allows customers to rate their food items and provide feedback, helping the restaurant maintain quality standards.

Admin User Interfaces

1. Admin Login Page:
    - Secure access for administrators to manage the backend of the application, including menu and order management.
2. Admin Login Error Page:
    - Error page displayed when incorrect login credentials are entered, or other login issues arise.
3. Admin Dashboard:
    - Centralized control panel for managing all aspects of the food ordering system, from menu items to sales statistics.

4. Admin Add Items Page:
    - Interface for adding new food items to the menu, including options for adding images and setting prices.
5. Admin View Users:
    - Admins can view, update, or disable user accounts, ensuring effective user management and security.
6. Admin Send Promotional Emails:
    - Tool for creating and sending promotional emails to customers to boost engagement and sales.

Database Design

The database design facilitates efficient data management and connectivity between the application and the SQLite database. Key tables include:

- Users: Stores user details like name, email, password, and contact information.
- Orders: Tracks orders placed by users, including order details, status, and history.
- Menu Items: Lists available food items, prices, and descriptions.

## Customer User Interfaces

**User Interface No**: 01

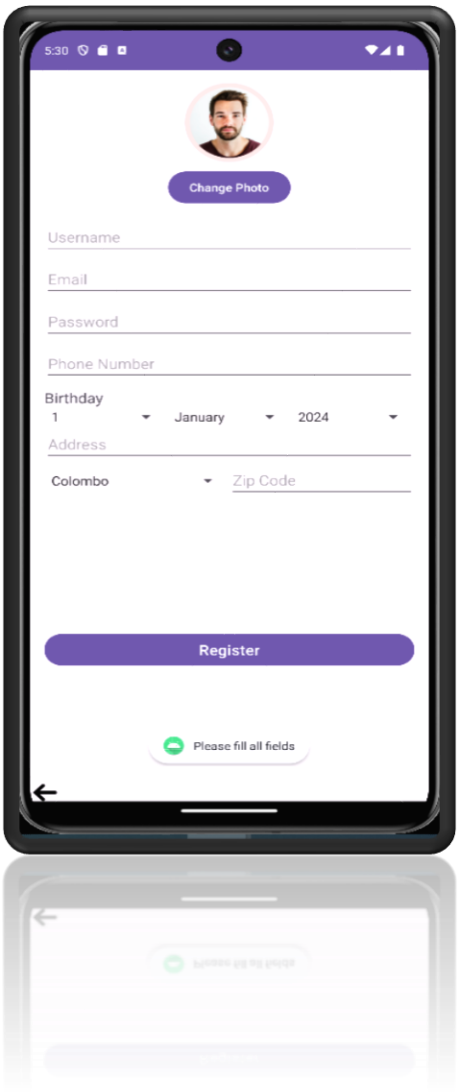
## **User Interface Name:** Welcome Page

- **Design:** The screen has a vibrant orange background, creating a warm and welcoming vibe. The top portion is decorated with images of various fast-food items like pizza slices, burgers, fries, soft drinks, and more, arranged in a playful pattern.
- **Text:** The center of the screen features the text "Welcome to AIDIA" in white, bold, and easy-to-read font. Below this is a subheading that reads, "Experience the taste of freshness with every bite – our meals are prepared with the finest, freshest ingredients, just for you."
- **Navigation:** At the bottom, there are two buttons: "Register" on the left and "Next" on the right, allowing the user to either sign up or proceed.

**User Interface No**: 02

## User Interface Name: User Register Page

- Design: The screen is designed with a soft lavender background, which complements the darker purple accents used for the buttons and borders. This color scheme creates a visually pleasing and cohesive look throughout the interface.
- Registration Form:
    - Profile Photo: At the top, there's a circular avatar placeholder with an option labeled "Change Photo," allowing the user to upload or update their profile picture.
    - Form Fields: Below the avatar, the form includes editable fields for:
        - Username: A text field where the user can enter their preferred username.
        - Email: A text field for the user's email address.
        - Password: A field for setting or updating the user's password.
        - Phone Number: A field to input the user's contact number.
        - Date of Birth: A dropdown menu or calendar picker where the user can select their birthdate.
        - Location: Fields for entering the user's address, including city and zip code.
- Convenience Features: The registration form is designed to streamline the user experience. If this were a Profile Update Screen, the user's existing data would automatically populate the fields, reducing the need for manual input and making it easier for users to update their information.
- Register Button: Below the form fields, there's a prominent purple "Register" button that users can click to submit their details.
- Validation Message: At the bottom of the screen, a green notification box provides feedback, such as "Please fill all fields" if required information is missing, ensuring that users complete the form correctly before submission.


5:30
Change Photo
Username
Email
Password
Phone Number
Birthday
1
January
2024
Address
Colombo
Zip Code
Register
Please fill all fields

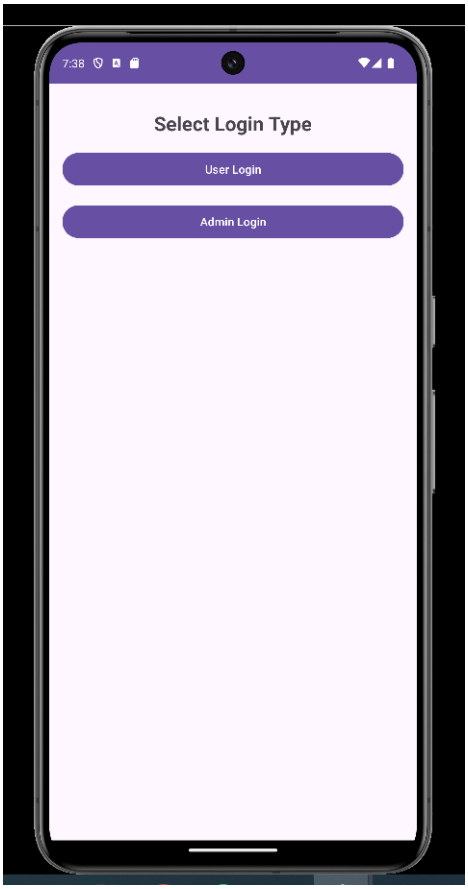
**User Interface No**: 03

## User Interface Name: Login Selection Page

• Design**:** The screen has a soft lavender background, creating a calm and inviting user experience. The darker purple accents for the buttons stand out against this soft background, drawing attention to the interactive elements.
• Login **Options:**

- The screen is centered around two large, rounded buttons for login options: "User Login" and "Admin Login."
- These buttons are prominently displayed in a bold purple color, making it clear where the user needs to interact.

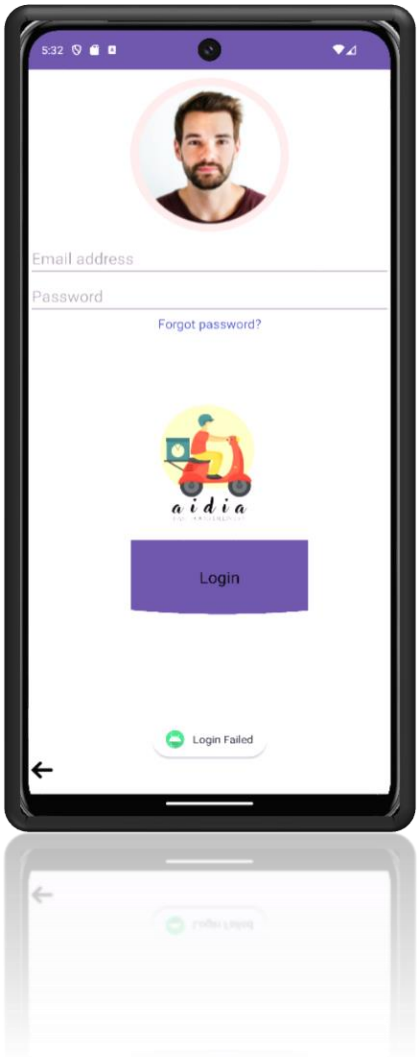
• Functionality**:** This screen serves as the initial point of interaction, allowing users to select their login type easily. The simplicity of the design ensures a straightforward user experience, with minimal distractions.



**User Interface No**: 04

## User Interface Name: Login Page

**Description**: The login page provides secure access for both customers and administrators of the Food Management System. If users do not have an account, they can easily navigate to the "Sign Up" page to create a new account and start using the app. The login page is designed for ease of use, ensuring a seamless experience for all users to access the features they need.



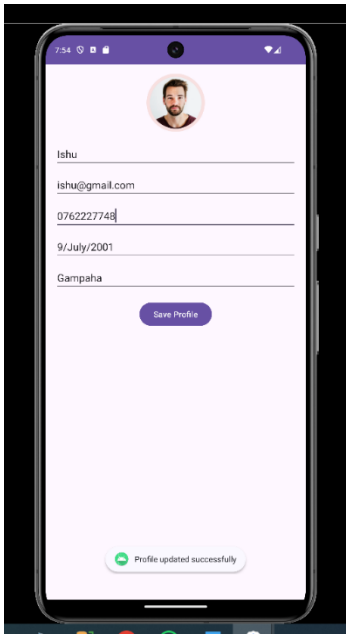
**User Interface No**: 05

## User Interface Name: Profile Update Screen

- Design: The screen has a soft lavender background, which contrasts well with the darker purple accents used for the buttons and borders.
- Profile Details: The top section features a circular avatar placeholder, followed by editable fields for:
    - Name:
    - Email:
    - Phone Number:
    - Date of Birth
    - Location:

Profile Update Screen has a feature where the logged-in user's data is automatically filled into the profile fields, making it convenient for the user to update their information without needing to enter it from scratch. This feature enhances the user experience by saving time and reducing effort.

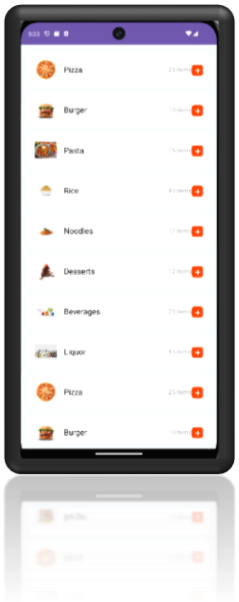
- Save Button: Below the form fields, there's a prominent purple "Save Profile" button.
- Confirmation Message: At the bottom, a green notification box confirms that the profile has been updated successfully.



**User Interface No**: 06

## User Interface Name: Menu Page

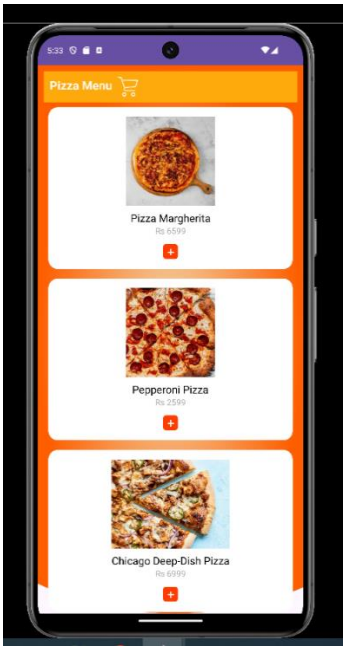
- **Design**: The menu screen continues the theme with a soft lavender background, providing a neutral canvas that highlights the vibrant images of the food categories. Each menu item is displayed in a card-like structure with rounded edges, consistent with the overall design language.
- Food Categories:
    - The screen showcases a list of food categories, each with an associated image, title, and the number of items available in that category.
    - Categories include "Pizza," "Burger," "Pasta," "Rice," "Noodles," "Desserts," "Beverages," and "Liquor."
- Add to Cart:
    - Each card features an orange "+" button on the right side, allowing users to quickly add items to their cart.
- User Experience: The design is intuitive, with the easy-to-read layout and visually appealing images making it simple for users to browse and select their desired items.



**User Interface No**: 07

## User Interface Name: Pizza Menu Screen

- **Design:** This screen follows a similar, orange-themed color scheme. The top banner, labeled "Pizza Menu," is in orange, with a shopping cart icon on the right, likely indicating a way to view the cart.
- **Menu Layout:** The menu items are displayed in a clean, scrollable list format. Each item features a high-quality image of the pizza on the left, the name of the pizza, and its price below the name.
- **Items Displayed:**
    - **Pizza Margherita:** Priced at Rs 6599.
    - **Pepperoni Pizza:** Priced at Rs 2599.
    - **Chicago Deep-Dish Pizza:** Priced at Rs 6999.
- **Action Button:** Each pizza item has a red "plus" button underneath, likely for adding the item to the cart.



**User Interface No**: 08

## User Interface Name: Cart View

**Description**: The Cart page provides a detailed view of the selected items in the user's cart, including the item names, prices, and quantities. The top of the screen shows the total amount calculated based on the items in the cart. Each item can be incremented or decremented using the purple buttons beside each item. The cart is easy to navigate, with large buttons for modifying item quantities and clear visibility of the total price.

**Purpose**: This screen is designed to give users control over their selected items, allowing them to review and adjust their orders before proceeding to checkout

**User Interface No**: 09

## User Interface Name: Contact Page

**Description**: If you have any questions, concerns or need help with your orders don’t hesitate to contact our admin team. We’re here to make sure you have best experience with our app.

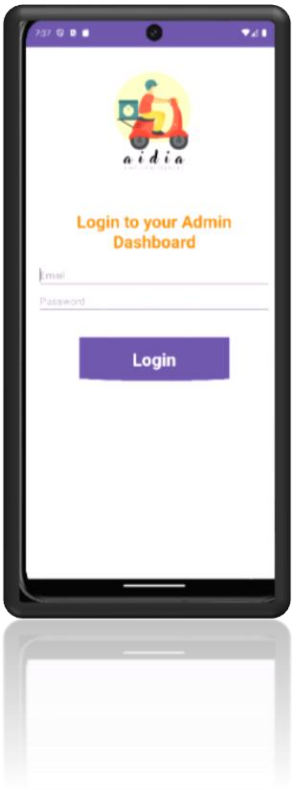
## Admin User Interfaces

**User Interface No**: 01

## User Interface Name: Admin Login Page

**Description** While creating food order, the admin login feature of the application enables authorized members to securely access its back-end. This login allows administrators to manage orders, change food items, regulate restaurant's menus and monitor usage by people. The login using secure authentication process ensures that only the entitled people can access the administrative features.

**Purpose**: The purpose of this screen is to restrict access to the admin dashboard, ensuring that only authorized personnel can manage and view the application's administrative functions.



**User Interface No**: 02

## User Interface Name: Admin Dashboard

**Description** Administrators may oversee and keep an eye on every part of the meal ordering app from a single location with the help of the Admin Dashboard. Managing menu items, taking orders, monitoring client comments, and seeing sales statistics are some of the important functions. The user-friendly interface guarantees effective navigation and management, enabling administrators to maintain the seamless operation of the application at all times.

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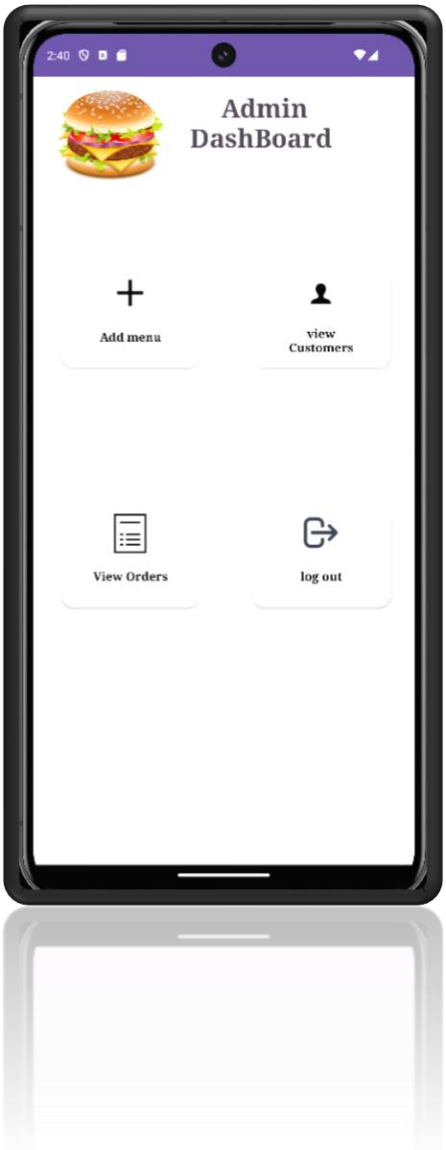
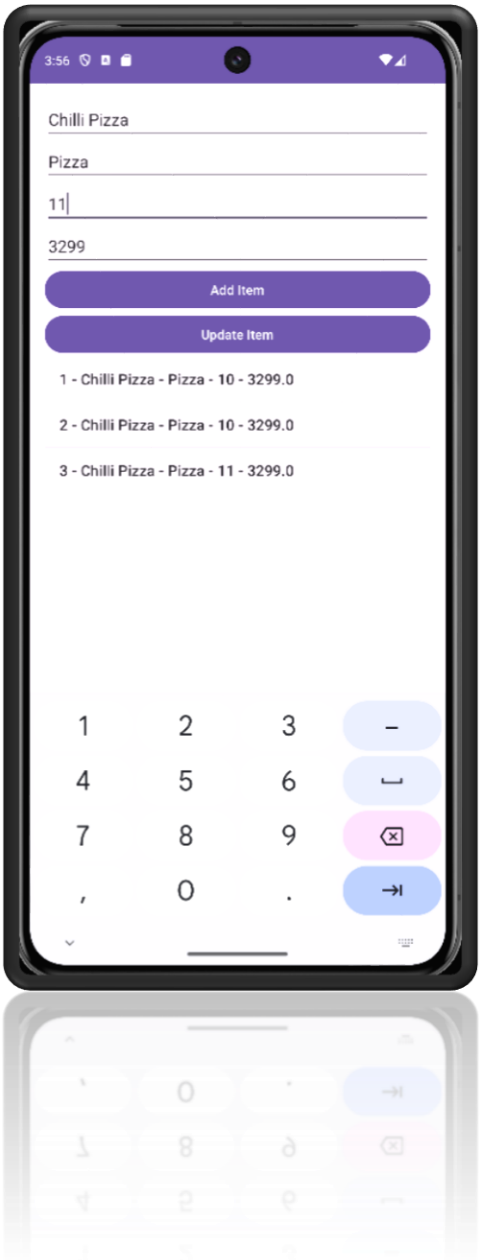


**User Interface No**: 03

## User Interface Name: Admin Add Items Page

**Description** Admins may add new food items to the app and modify the menu using the "Admin Add Items" page. In addition to the opportunity to submit a photo, this page has areas for entering the item's name, description, price, and category. Admins may simply and rapidly edit the menu, keeping the options current and relevant for users, thanks to the simple layout.

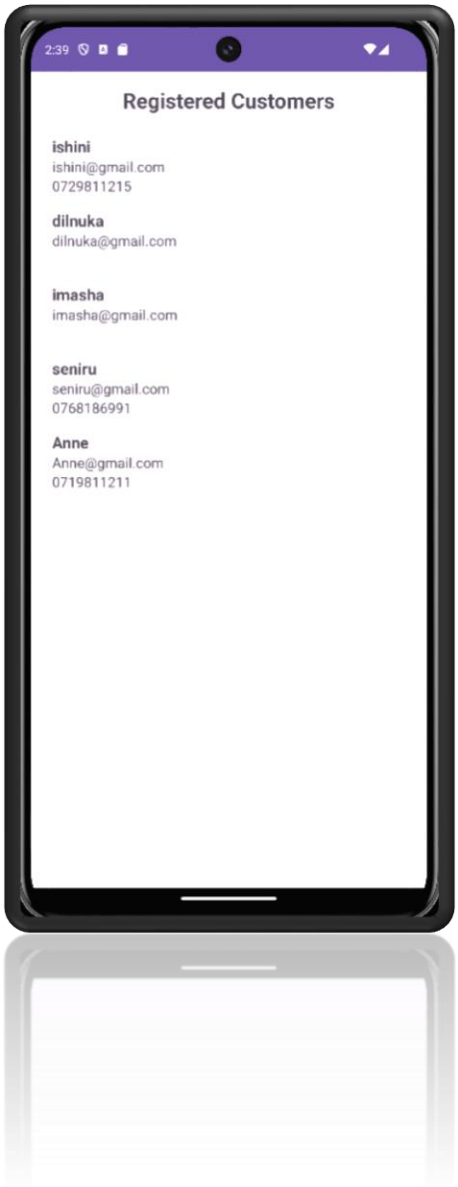


**User Interface No**: 04

## User Interface Name: 3. Registered Customers View

**Description**: The Registered Customers page displays a list of all users who have registered within the application. Each entry includes the customer's name, email address, and phone number, arranged in a clean, vertical list format. The page follows a minimalist design, ensuring that the admin can quickly scan through the list of registered users.

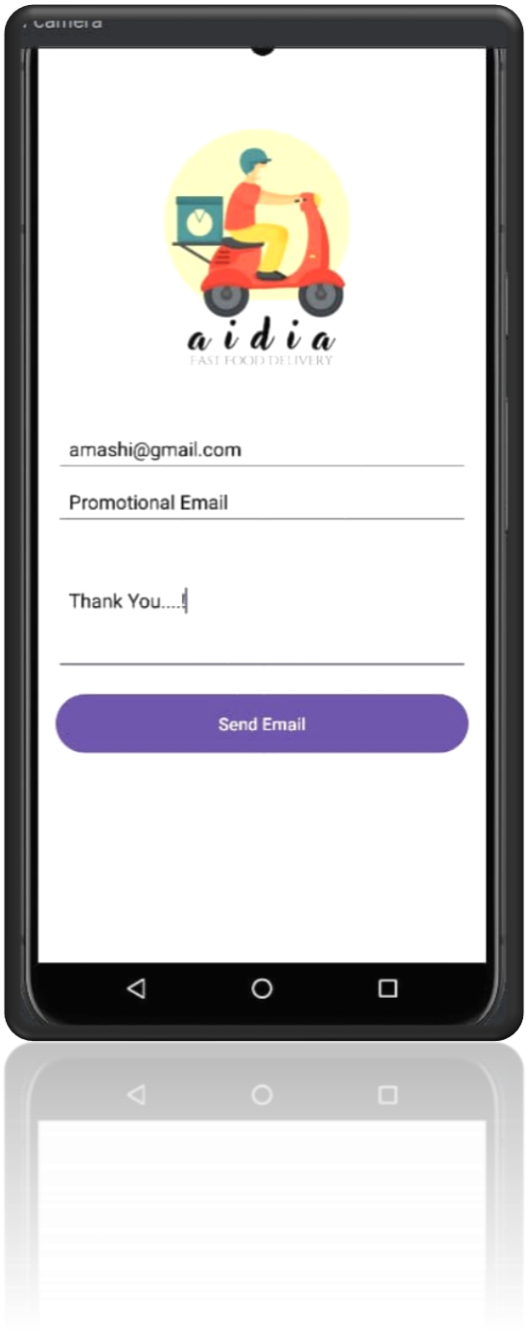
**Purpose**: This page is designed for administrative oversight, allowing the admin to easily view and manage customer data.



**User Interface No**: 05

## User Interface Name: Admin Send to Promotional Emails

**Description** The administrator may design and send promotional emails to clients with ease thanks to this capability. It promotes discounts, new menu items, and special deals straight to customers' email inboxes, increasing consumer interaction and improving revenue.

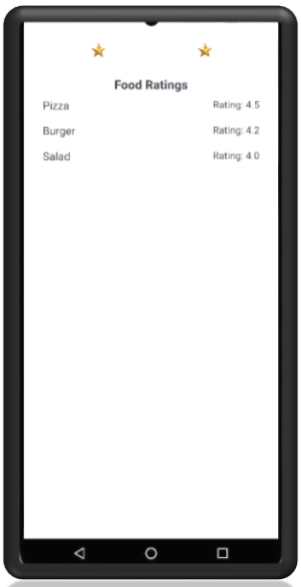


**User Interface No**: 06

## User Interface Name: Foods & Brach Ratings Page

**Description**: Administrators can review ratings and comments provided by customers about food items and shop experiences on the Admin Ratings page. This allows admins to monitor customer feedback, highlighting popular meals and identifying areas needing improvement to ensure quality and customer satisfaction.

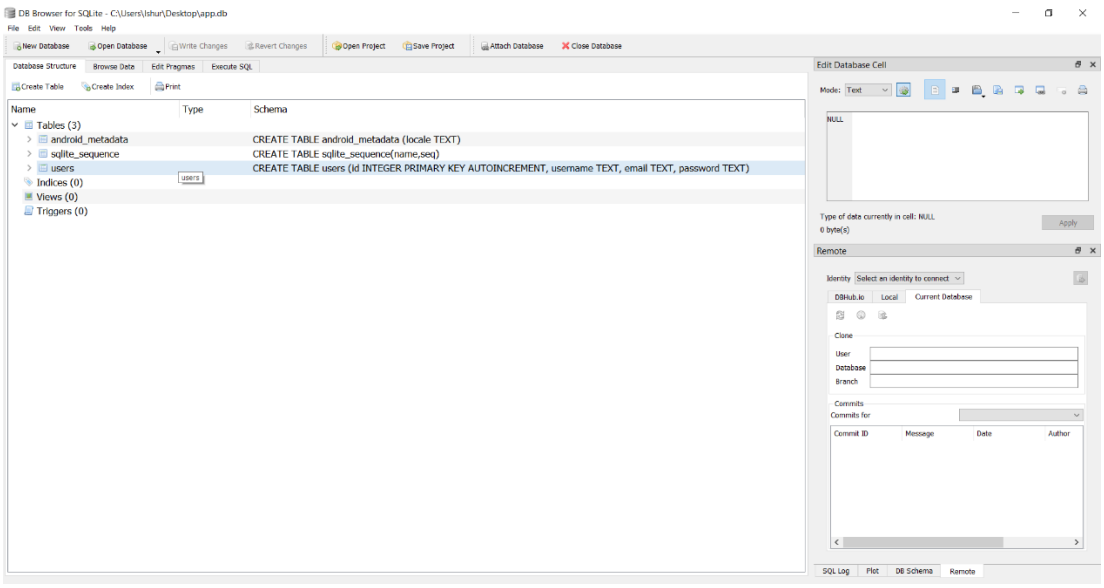
Additionally, admins can access monthly data analytics, such as high-demand food items and highly rated shops.


Food Ratings
Pizza
Rating: 4.5
Burger
Rating: 4.2
Salad
Rating: 4.0

Shop Ratings
Shop B
Rating: 5.0
Shop A
Rating: 4.0

## Data Base Design

The process of creating a link between an application and a database system so that data may be exchanged is known as database connectivity. For it to do this, a connection string must be configured containing information such the database name, credentials, and server address. Applications can run SQL queries to retrieve, insert, update, or remove data once they are linked. In order to connect databases with software applications and enable dynamic data operations, connectivity is necessary.

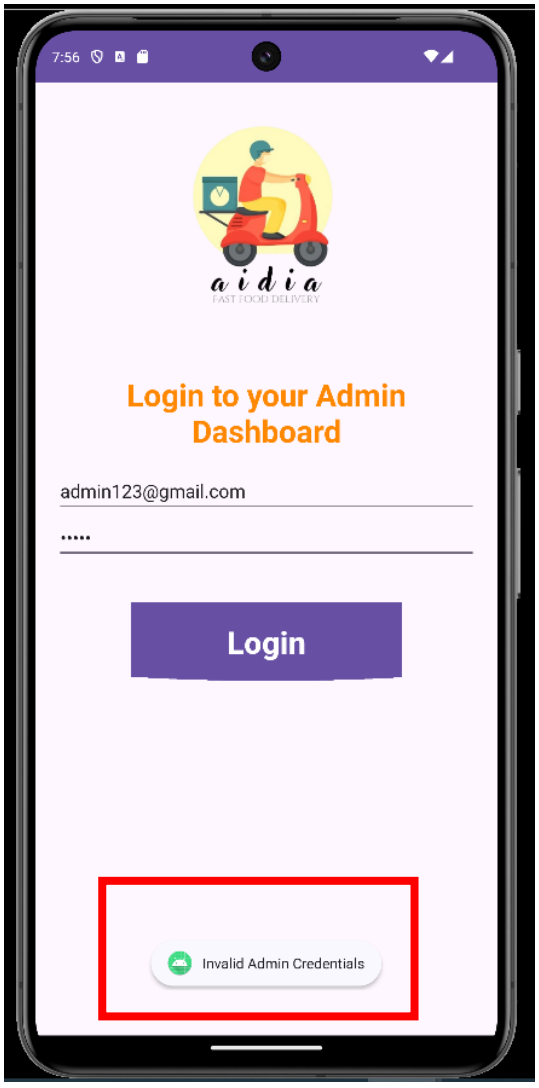


## Exception Handling

**User Interface No**: 01

## User Interface Name: Invalid Admin Login Attempt

Description: In the Invalid Admin Login Attempt page, the admin user attempts to log in using the credentials admin123@gmail.com and a password. Upon pressing the login button, an error message "Invalid Admin Credentials" appears at the bottom of the screen, indicating a failed login attempt. The design remains consistent with the login screen but adds a feedback mechanism for incorrect credentials.

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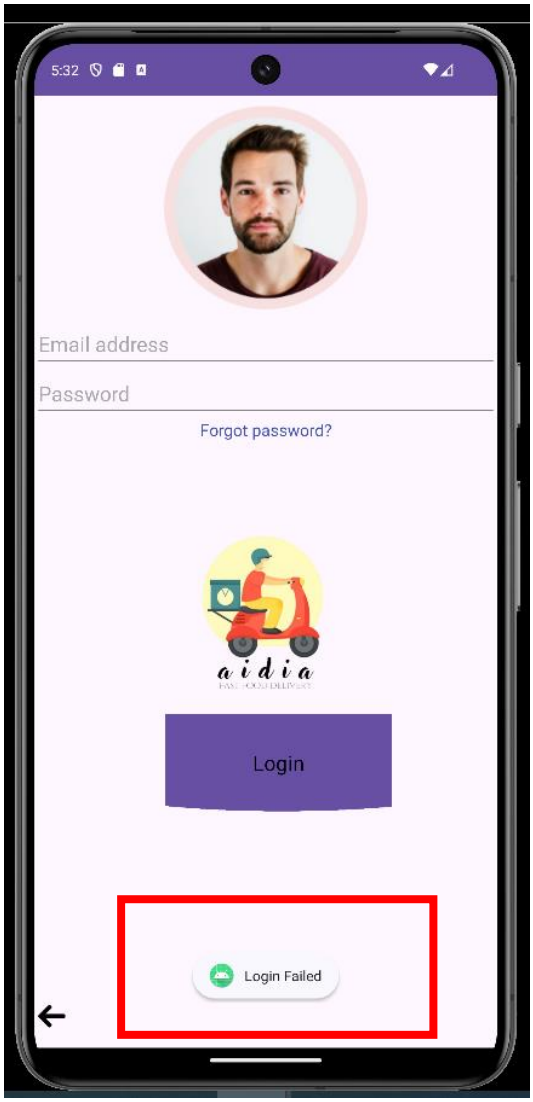
**User Interface No**: 02

## User Interface Name: Invalid User Login Attempt

Description:
In the Invalid User Login Attempt page, the user tries to log in using credentials that are either incorrect or not registered. If the user has not completed the registration process or if the credentials are inaccurate, the login attempt will fail. Upon pressing the login button, an error message, such as "Login Failed" will appear at the bottom of the screen. This message alerts the user that their login attempt has been unsuccessful due to unrecognized or non-existent credentials.



**User Interface No**: 03

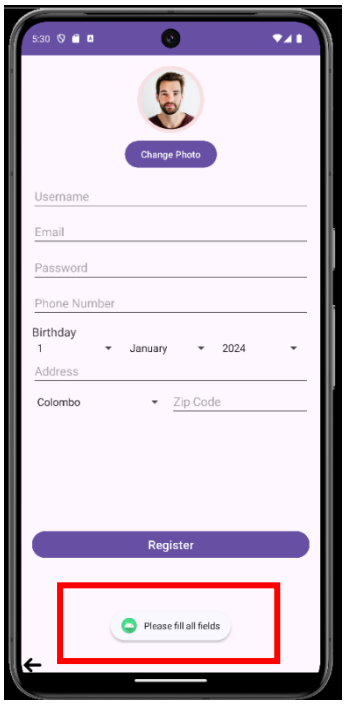
## User Interface Name: Invalid User Login Attempt

Description:

The design of this page remains consistent with the main login screen but includes an enhanced feedback mechanism to guide users. If a user attempts to log in without prior registration, they will be prompted with an error message that clearly states the requirement to register before logging in.

To prevent invalid login attempts, the registration process is emphasized as mandatory for all users. The registration page enforces that all fields—such as username, email, password, birthday, address, district, zip code, and phone number—are required and must be filled out correctly. This ensures that only fully registered users can successfully log in, maintaining the integrity and security of the application.

The purpose of this design is to encourage users to complete the registration process before attempting to access their accounts, reducing the likelihood of login errors and enhancing overall user experience.



## 3.Results

**Functional Implementation:**

- Login and registration systems were successfully integrated.
- Order management features, including customization and order history, were operational.
- SQLite database effectively handled local data storage.
- Camera access and image upload functionalities were tested and verified.
- Google Map integration displayed accurate shop locations and nearest branch suggestions.

## 4.Discussion

The development process involved several challenges, particularly in integrating various functionalities like camera access and Google Map services. The team collaborated effectively to resolve issues and ensure a cohesive application. User feedback from initial testing indicated high satisfaction with the application's usability and features.

**Challenges and Solutions**

1. Design of User Interface and Experience (UI/UX)

**Challenge**: Creating a user-friendly and captivating user interface/user experience that guarantees a smooth ordering process.

**Solution**: To learn about the preferences and procedures of your target audience, conduct user research. To improve the interface, apply the principles of user-centered design and carry out usability testing. Make use of a simple, intuitive layout with obvious calls to action.

2.Order tracking in real time

**Challenge**: Providing real-time order status and delivery tracking information

**Solution**: Use delivery providers' APIs and GPS to integrate real-time location tracking. Make that the backend of the app can effectively manage real-time data updates.

3.Controlling Purchases and Stock

**Challenge**: Managing orders and inventories effectively to prevent mistakes and guarantee on-time delivery

**Solution**: To integrate an order management system that continuously monitors inventory levels. Integrate inventory management software if at all feasible, and use automatic notifications for low inventory.

4.User Feedback and Support

**Challenge**: Responding to concerns and customer comments while offering prompt assistance.

**Solution**: Include a feedback system in the app and offer customer service channels that are responsive (e.g., email). Utilize user feedback to fix frequent problems and make ongoing app improvements.

## Customer comments and enhancements

The final product is shaped in large part by user feedback. In order to pinpoint problems and areas that needed work, the development team ran user testing and gathered feedback. The team is able to enhance by optimizing the order preparation process and accelerating the project thanks to this innovative technique. Increased levels of engagement and recurring business from satisfied customers attest to the efficacy of this strategy.

## Response

In summary, the Food Mart mobile application has satisfied the demands of customers and business owners in the food delivery industry. The project's thorough planning, creative ideas, and sensitivity to user input have improved operating efficiency and improved the user experience significantly. In order to keep the software successful and satisfy user demands, it will be essential to keep improving existing features and looking into adding new ones.

# 5.References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## 6.Acknowledgement

We extend our heartfelt thanks to our project supervisor for their continuous support, valuable guidance, and feedback throughout this project. Their insights and experience have been instrumental in overcoming challenges and ensuring the successful development of our food management software.

We also wish to express our appreciation to each member of our group. This project was a true team effort, with each member taking on significant responsibilities, from designing user interfaces to handling database integration and implementing key functionalities. The collective dedication, skill, and enthusiasm of the group were essential to delivering a high-quality solution.

Lastly, we are grateful for the constructive feedback and suggestions received throughout the project. These contributions were crucial in refining our ideas and improving our work.

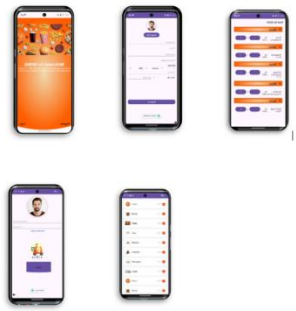
# 7.Appendices

- Technical Specifications

  gives comprehensive details and demonstrations of the Food Management System's database structure, API integrations, and system design.

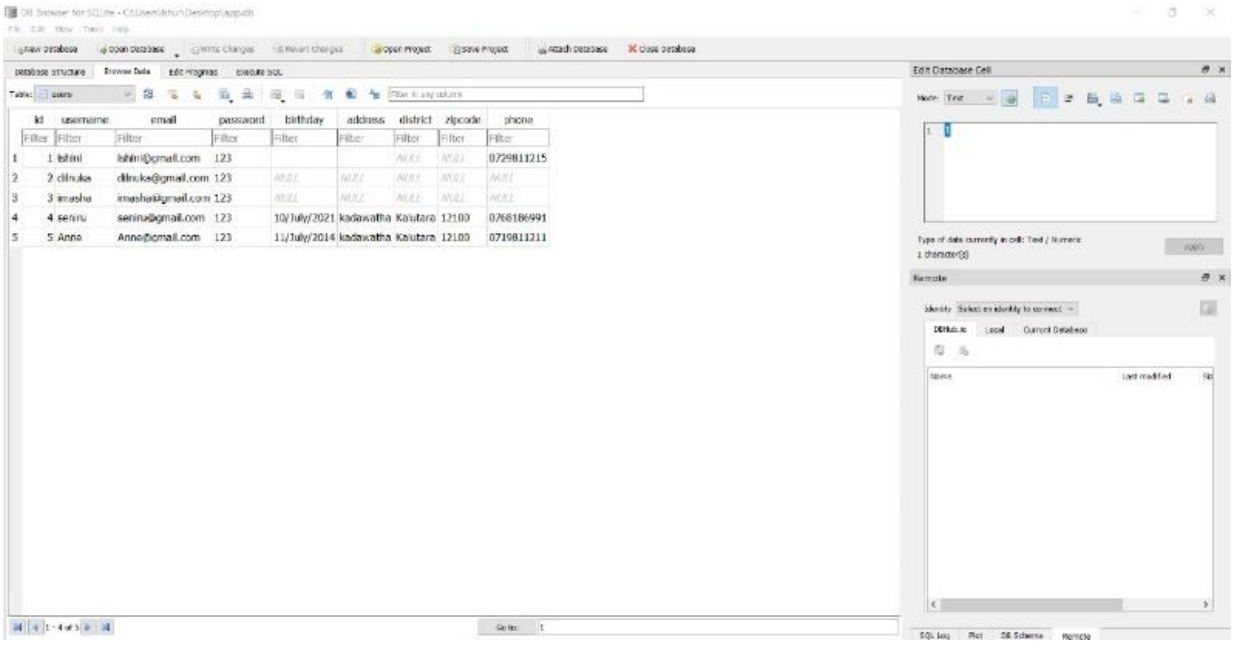
- Mockup of the User Interface

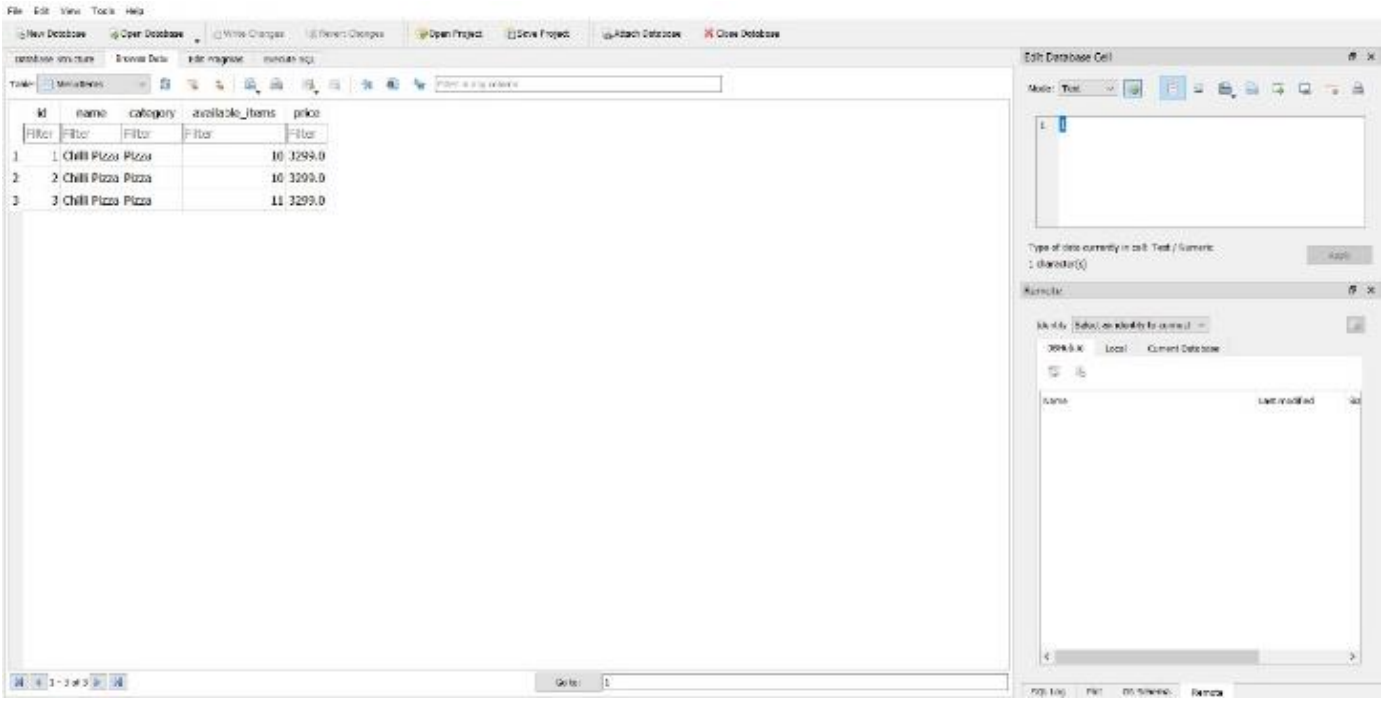
  Features essential features and layouts of the admin and customer interfaces in the form of design mockups and screenshot.

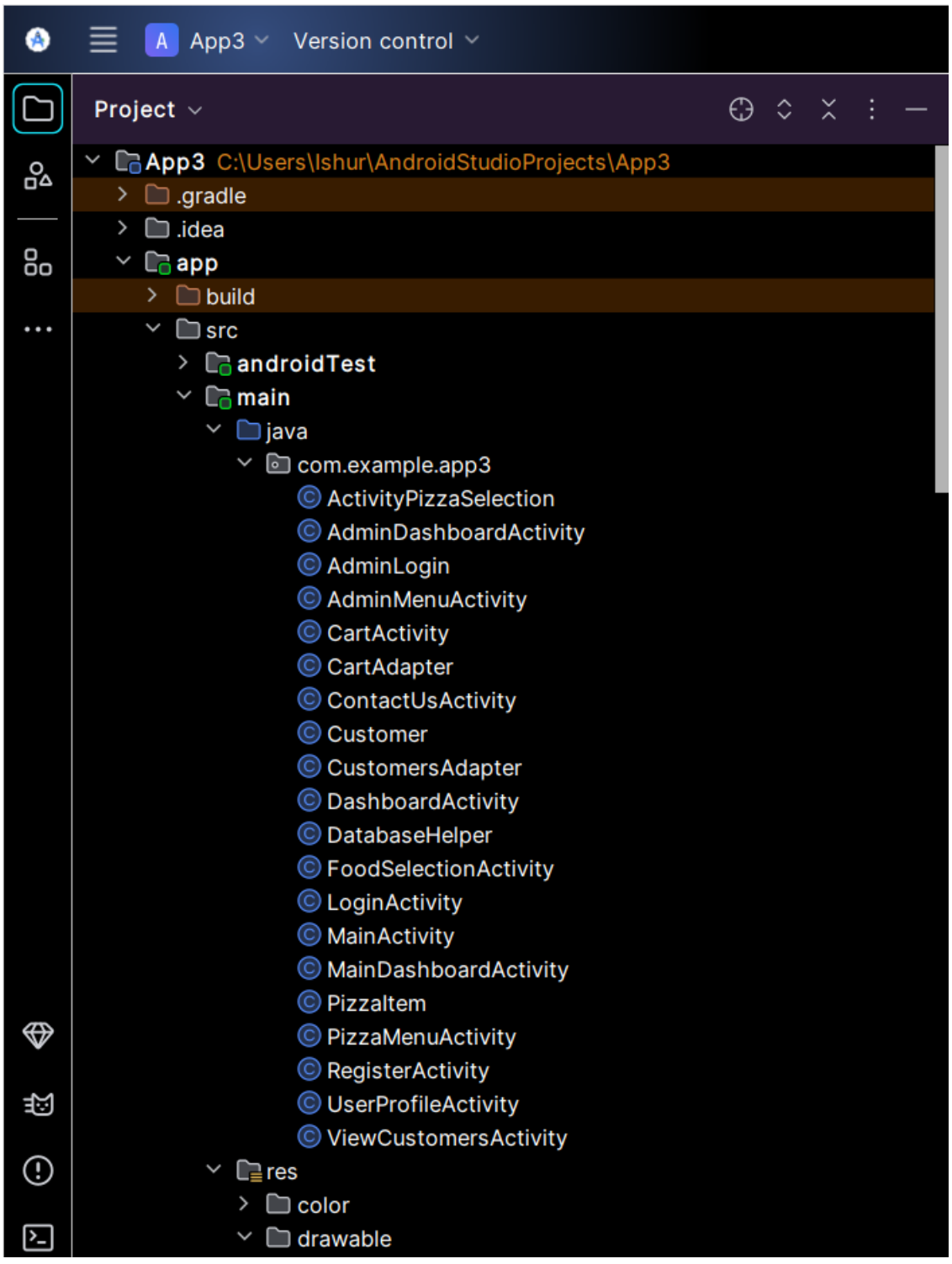


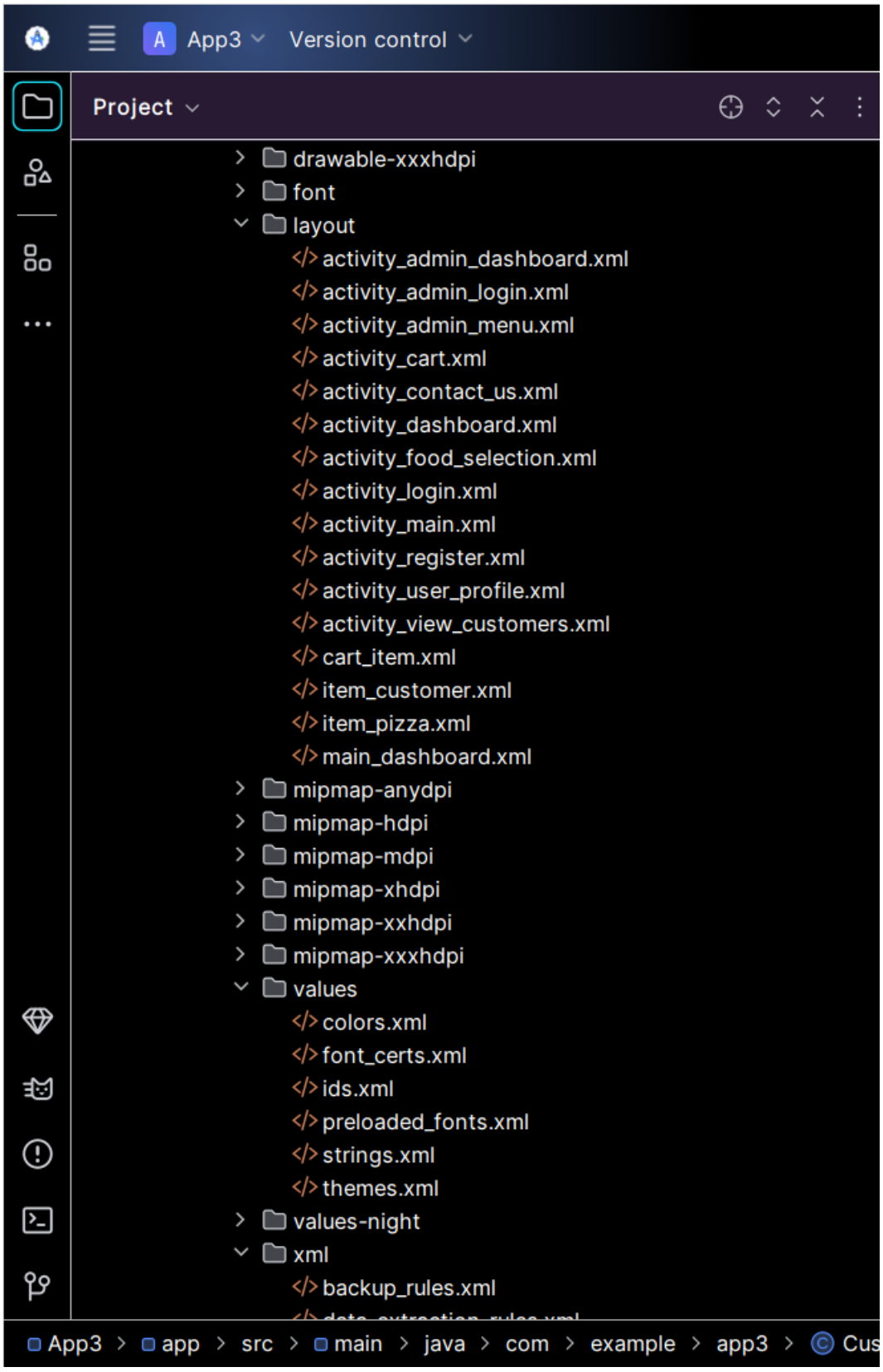
- Sample Code

  This section includes code samples for the application's notification systems, database connections, and API user interface




File Edit View Tools Help
New Database
Open Database
Write Changes
Revert Changes
Open Project
Save Project
Attach Database
Close Database
Edit Database Cell
id name category available_items price
1 1 Chilli Pizza Pizza 10 3299.0
2 2 Chilli Pizza Pizza 10 3299.0
3 3 Chilli Pizza Pizza 11 3299.0


App3
Version control
Project
App3 C:\Users\Ishur\AndroidStudioProjects\App3
.gradle
.idea
app
build
src
androidTest
main
java
com.example.app3
ActivityPizzaSelection
AdminDashboardActivity
AdminLogin
AdminMenuActivity
CartActivity
CartAdapter
ContactUsActivity
Customer
CustomersAdapter
DashboardActivity
DatabaseHelper
FoodSelectionActivity
LoginActivity
MainActivity
MainDashboardActivity
PizzaItem
PizzaMenuActivity
RegisterActivity
UserProfileActivity
ViewCustomersActivity
res
color
drawable


App3
Version control
Project
drawable-xxxhdpi
font
layout
activity_admin_dashboard.xml
activity_admin_login.xml
activity_admin_menu.xml
activity_cart.xml
activity_contact_us.xml
activity_dashboard.xml
activity_food_selection.xml
activity_login.xml
activity_main.xml
activity_register.xml
activity_user_profile.xml
activity_view_customers.xml
cart_item.xml
item_customer.xml
item_pizza.xml
main_dashboard.xml
mipmap-anydpi
mipmap-hdpi
mipmap-mdpi
mipmap-xhdpi
mipmap-xxhdpi
mipmap-xxxhdpi
values
colors.xml
font_certs.xml
ids.xml
preloaded_fonts.xml
strings.xml
themes.xml
values-night
xml
backup_rules.xml
App3 › app › src › main › java › com › example › app3 ›