Flutter Course Project Report

Project Title: E-Commerce Shopping Application

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Course: Special/Selected Topics

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1. Introduction

This project is a fully functional Flutter-based e-commerce mobile application developed to satisfy and exceed the requirements stated in the Flutter Course Project Rubric.

The application simulates a real shopping experience, including:

- User authentication

- Product browsing

- Adding items to cart

- Managing item quantities

- Checkout and payment

- Order placement

- Order tracking with ETA

- Product reviews

- Profile management

The app uses clean state management principles and persistent storage and provides a smooth, modern, user-friendly UI.

2. Project Objectives

According to the rubric, the project must demonstrate:

- Multiple screens with navigation

- CRUD operations

- Data persistence

- State management

- Form validation

- UI composition using standard Flutter widgets

- Optional bonus features

This project meets all requirements and implements several extra enhancements beyond the minimum expectations.

3. Application Features

3.1 User Authentication

- Users can register with a username and password

- Credentials are stored securely using SharedPreferences

- Users must log in with matching credentials

- Logging out clears only the session (not the stored account)

3.2 Home Page & Product Catalog

- GridView layout showcasing multiple products

- Products include image, name, and price

- Clicking a product opens a detailed view

- Smooth Hero animations between screens

3.3 Product Details Screen

- Enlarged product image

- Description, price, and average star rating

- Option to:

    - Add or remove from cart

    - Write a review

    - View all reviews

3.4 Reviews System

- Users can submit:

    - A star rating (1–5)

    - A written comment

- Reviews are displayed with username, rating, and message

- Multiple reviews per product supported

3.5 Shopping Cart

- Fully functional cart system with:

    - Add item

    - Remove item

    - Increase/decrease quantity

- Total price dynamically calculated

- Cart badge shows number of items

3.6 Checkout & Payment

- Payment form includes:

    - Cardholder name

    - Card number (must be 16 digits)

    - CVV (must be 3 digits)

- Validation prevents incorrect input

- Upon successful payment, an order is generated

3.7 Order Placement & Confirmation

- After payment, the app:

    - Creates an Order ID

    - Stores order total

    - Calculates ETA (+3 days)

    - Records the order timestamp

- Confirmation screen displays:

    - Order ID

    - Total

    - ETA

    - "Track Order" button

3.8 Order Tracking Page

Includes:

- Progress bar showing delivery status

- Timeline steps:

    - Order placed

    - Packed

    - Shipped

    - Out for delivery

- ETA display

- Delivered status when complete

3.9 Profile Page

- View and edit username/password

- Logout functionality

- If an order is active, a "Track Current Order" button appears

4. Technical Implementation

4.1 State Management

The app uses Provider, a recommended Flutter architecture pattern.
 State objects include:

- Products

- Cart (with item quantities)

- User session

- Reviews

- Active order

All screens reactively update when state changes.

4.2 Data Persistence

The app uses SharedPreferences to store:

- Registered account data

- Login session

This allows the user to close and reopen the app without losing their account.

4.3 CRUD Functionality

Create

- Add reviews

- Add items to cart

- Create new order

Read

- View products

- View reviews

- View cart contents

- View order tracking data

Update

- Increase/decrease quantity

- Update profile information

Delete

- Remove items from cart

5. UI/UX Design

The app uses:

- Card widgets

- GridView

- ListTiles

- Form widgets

- ElevatedButtons

- Snackbars for feedback

- Hero animations

- Linear progress indicators

The UI is clean, readable, and consistent with modern app design.

6. Conclusion
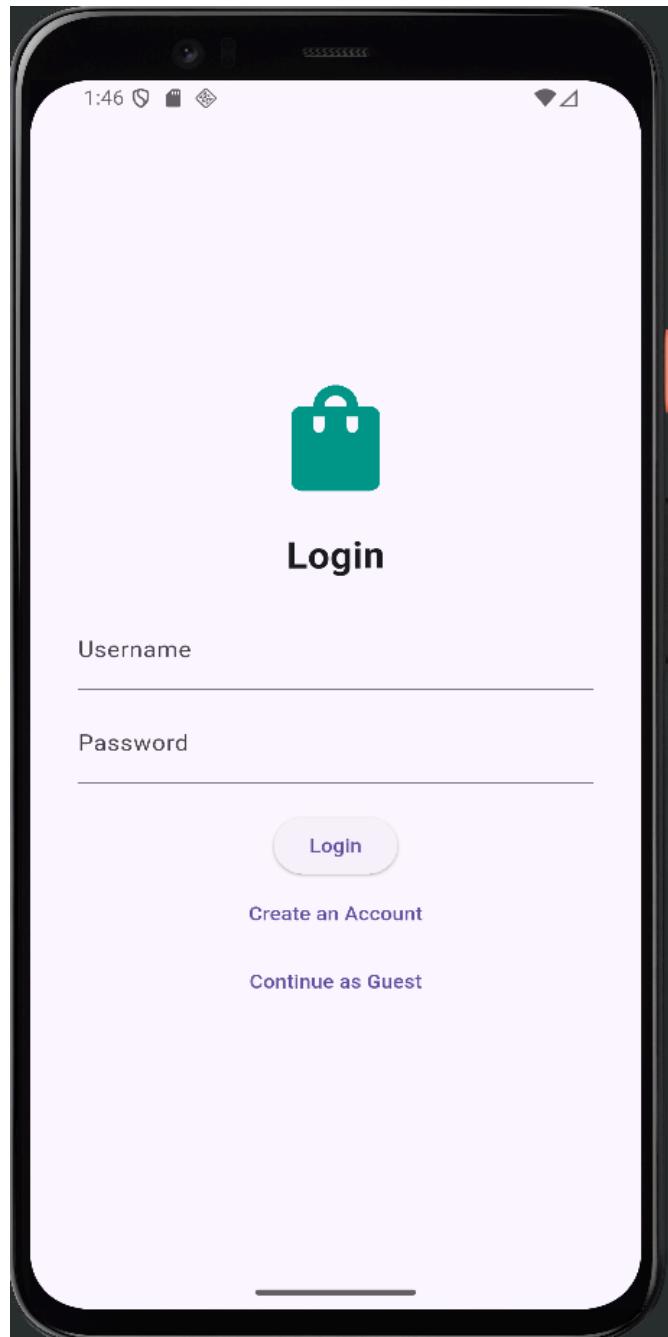
This Flutter application is a complete, polished, feature-rich mobile shopping system.
 It not only meets but exceeds course expectations through enhanced functionality such as reviews, order tracking with ETA, animations, and a professionally structured user flow.

Appendix A – Application Screenshots
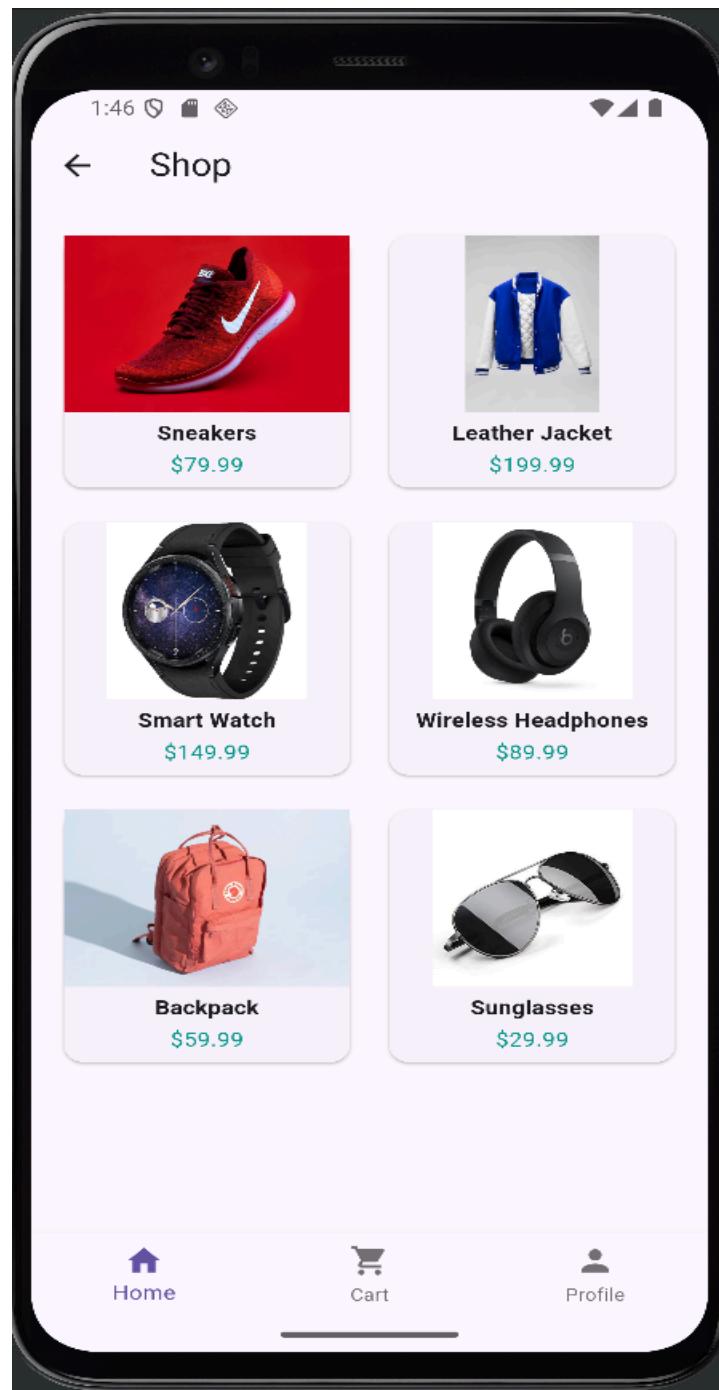
Figure 1: Login Page

This screen allows users to log in using their saved account credentials or proceed to registration or guest mode.
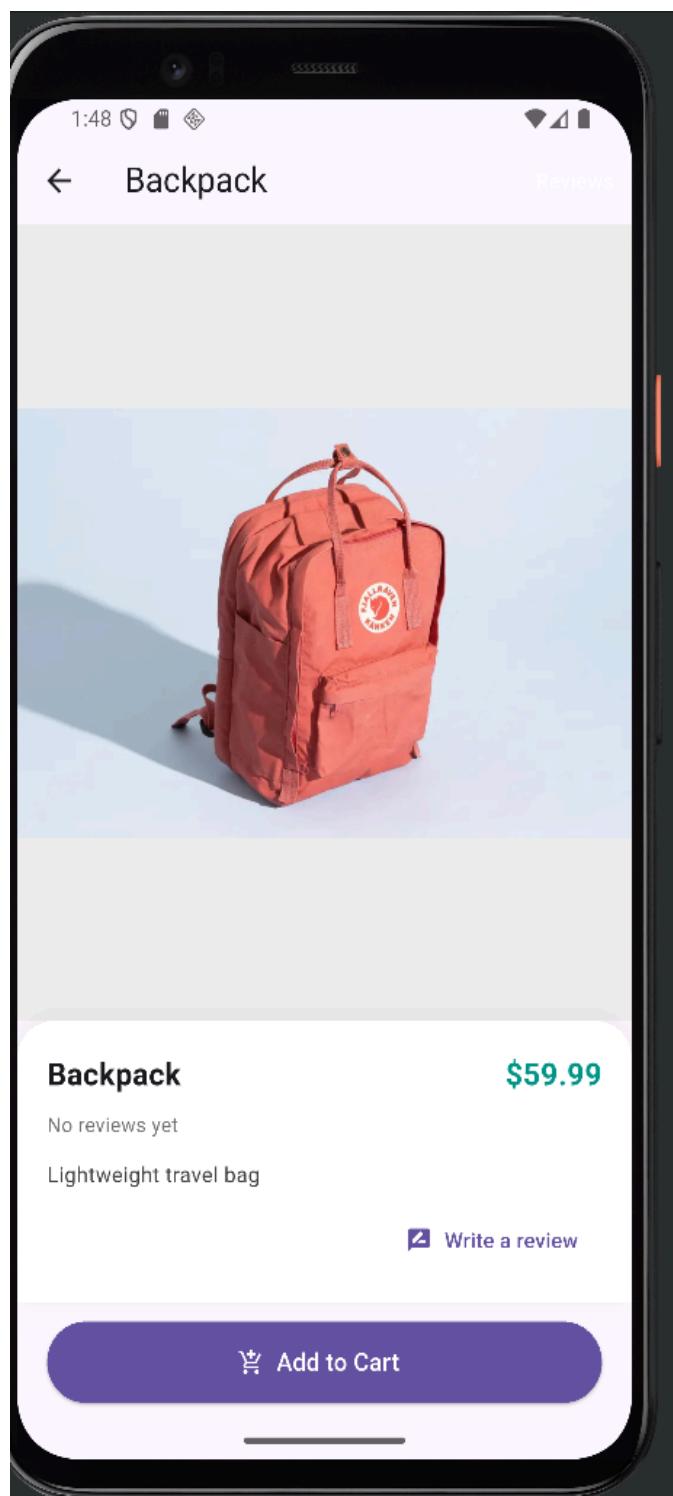
Figure 2: Home Page

Displays the product catalog using a clean grid layout, with images, names, and prices of all available items.
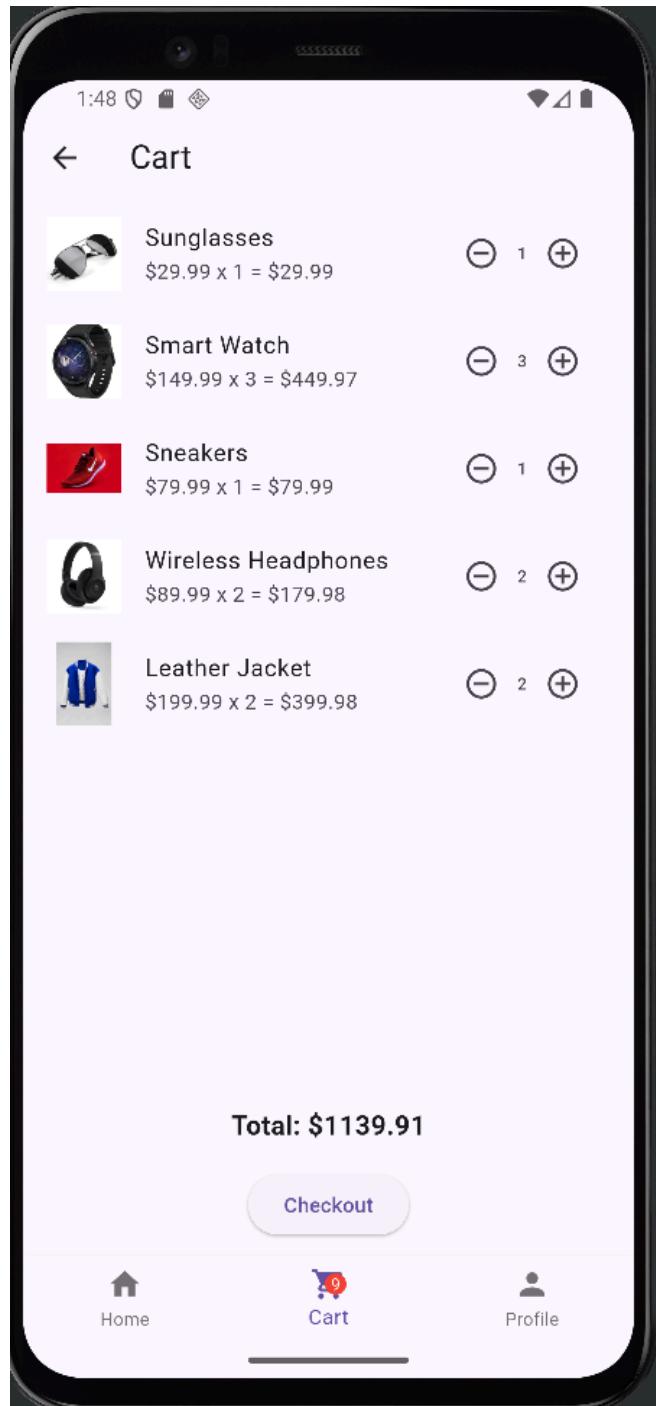
Figure 3: Product Details Page

Shows detailed information about a selected product, including its price, description, and review options. Users can add the item to their cart from this page.
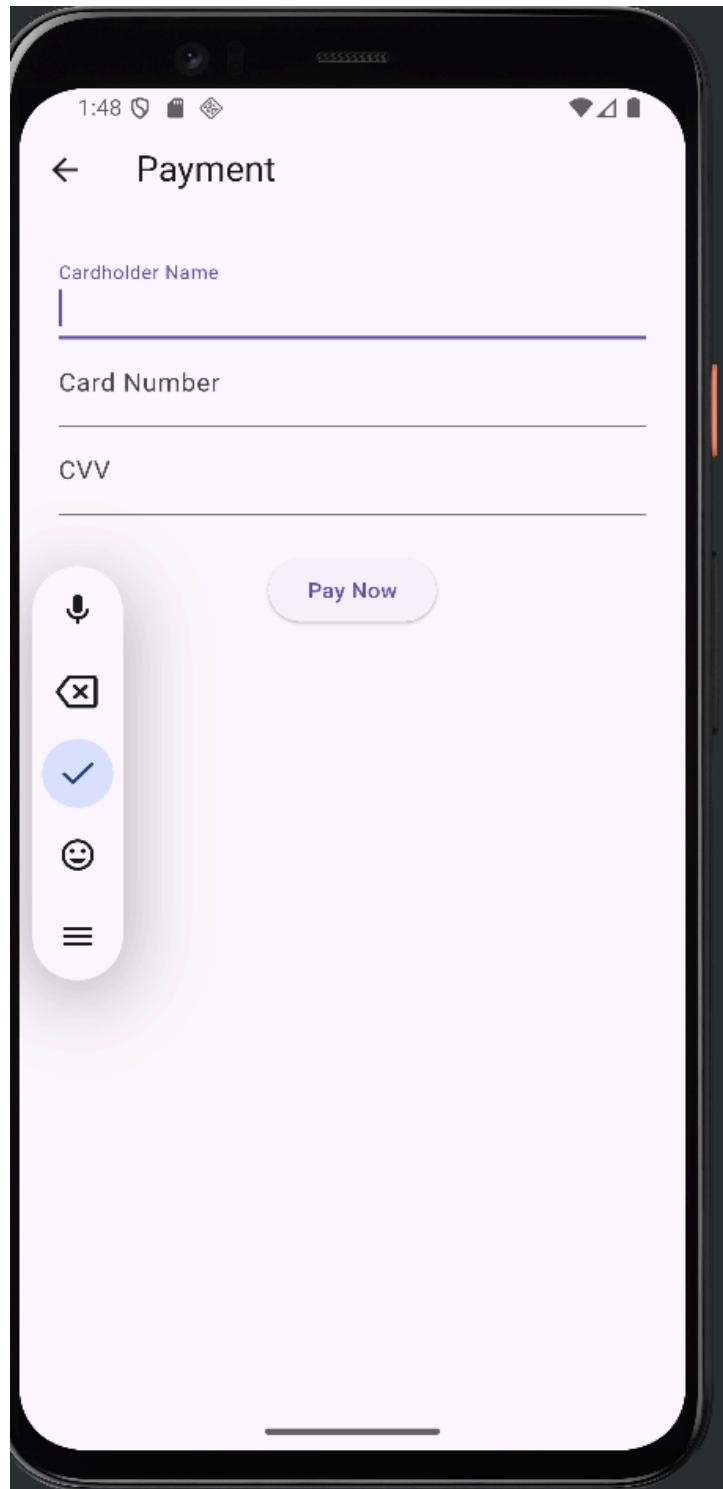
Figure 4: Cart Page

Shows all items added to the cart with quantity controls and the total price. Users may increase, decrease, or remove items and proceed to checkout.
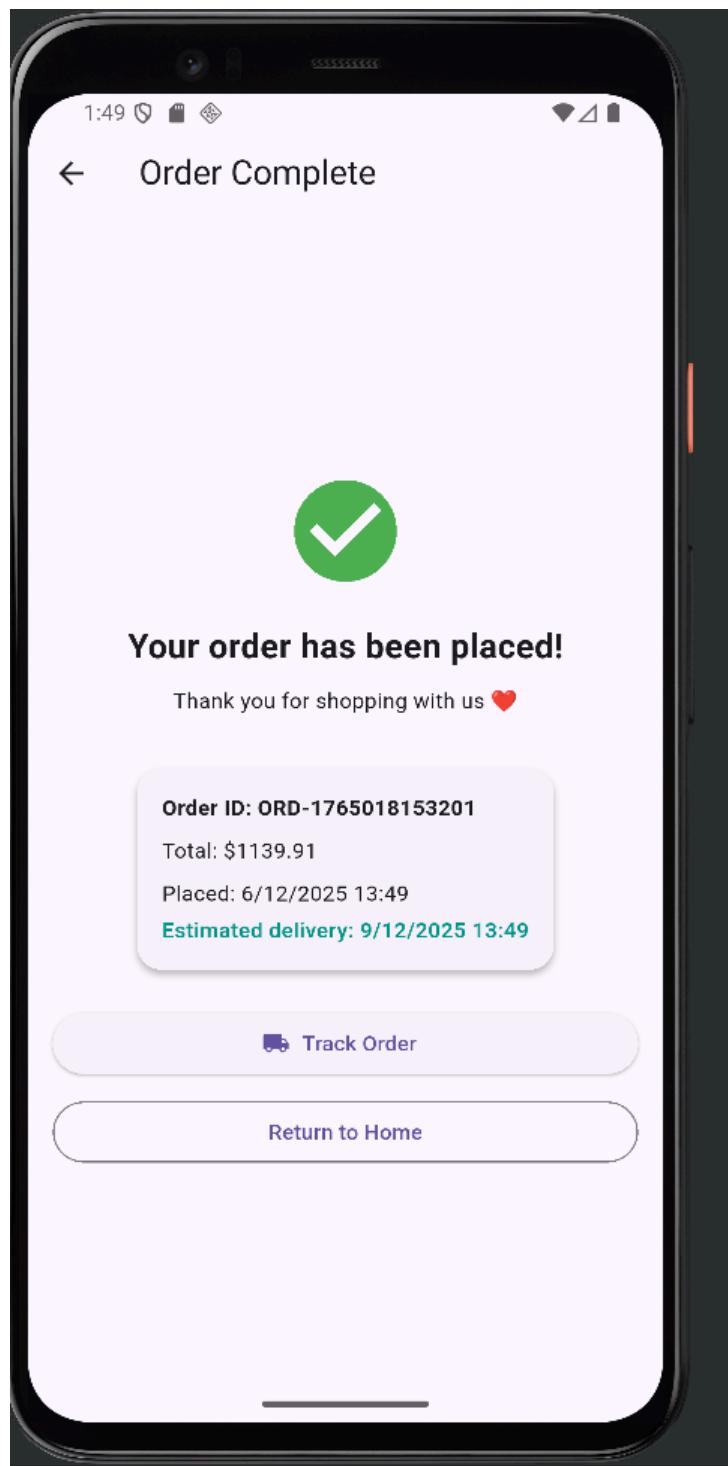
Figure 5: Payment Page

This form accepts cardholder name, card number, and CVV with built-in validation to ensure correct input before processing payment.

Figure 6: Order Confirmation Page

After a successful payment, this screen confirms the order, displays the order ID, total, placement time, and ETA. Users may return home or proceed to order tracking.

Figure 7: Order Tracking Page

Displays the current order's status with a progress bar and a step-by-step delivery timeline (Order placed → Packed → Shipped → Out for delivery). Includes ETA and order date details.