TRIBHUVAN UNIVERSITY

Institute of Science and Technology

Bhaktapur Multiple Campus

Dudhpati, Bhaktapur (NEPAL)

A

Project Report

On

"Rupali Beauty Point"

For

E-Commerce (CSC370)

6th semester Case study submitted in the partial fulfillment of the requirements for the degree of Bachelor of Science in Computer Science and Information Technology

Under the supervision of
Mr. Suraj Thapa Magar

Submitted By:

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Submitted to:

Department of Computer Science and Information Technology

CERTIFICATE OF APPROVAL

The undersigned certify that they have read and recommended to the respective subject teacher and external teacher for acceptance, a project report entitled as " Rupali Beauty Point " submitted by **Yumesh Ban and Rupesh Aacharya** for the partial fulfillment of the requirement for the degree of Bachelor of Science in Computer Science and Information Technology

……	…….
External Examiner	Suraj Thapa Magar
Tribhuvan University	Supervisor

ACKNOWLEDGEMENT

Our report is based on “Rupali Beauty Point” that has been prepared with intensive research and dedication. An optimum effort has been made while preparing this documentation and presenting it in front of you. I would like to thank each and every person who directly and indirectly helped in this report. It’s my duty to place a sincere gratitude towards Bhaktapur Multiple Campus and administration team for imagining beautiful environment and enriching me with equipped facilities to convert our imagination into reality. Furthermore, we would like to thank our supervisor **Mr. Suraj Thapa Magar** and other mentors for helping me with each and every problem related to this report.

With respect,

Rupesh Aacharya,

Yumesh Ban.

ABSTRACT

Rupali Beauty Point is a full-stack e-commerce web application developed to streamline the online shopping experience for beauty and personal care products in Nepal. With the rapid digitalization of retail and the increasing interest in skincare, makeup, and self-care products, there exists a gap in localized online platforms dedicated solely to this niche. This project aims to address that gap by providing a feature-rich, responsive, and user-friendly website built using modern full-stack development technologies. Hosted via **Vite** in **Visual Studio Code**, the platform includes modules for product browsing, user authentication, category filtering, cart management, and secure checkout. Through this report, we detail the system's design, architecture, challenges faced, and future potential as a scalable digital marketplace for the Nepali beauty industry.

Table of Contents

CHAPTER 1: INTRODUCTION

1.1 Background

With the growth of digital commerce, consumer behavior is shifting toward the convenience of online shopping. The beauty and personal care industry, in particular, has seen significant global expansion, driven by product diversity, brand awareness, and influencer marketing. However, in Nepal, this sector lacks a dedicated online platform that caters exclusively to beauty products.

Rupali Beauty Point is a full-stack e-commerce solution designed to fill this niche. It focuses on delivering an accessible, organized, and efficient shopping experience for skincare, makeup, haircare, and wellness items. The project embraces modern web technologies to empower local beauty vendors and meet the demands of digital-first consumers.

1.2 Problem Statement

While general e-commerce platforms exist in Nepal, they often provide a broad range of products and lack specialization. This results in limited categorization, poor product discoverability, and unsatisfactory user experiences for beauty-focused consumers. Additionally, many small to medium-scale beauty product sellers lack the resources or technical expertise to establish their digital presence. These businesses face challenges such as:

- Lack of targeted online platforms for beauty products
- Difficulty reaching digital customers
- Inability to provide smooth checkout experiences
- Absence of product-specific search and filtering mechanisms

Rupali Beauty Point addresses these problems by offering a specialized, full-stack web application that centralizes beauty products into a user-friendly interface with tailored features.

1.3 Objective

The primary objective of this project is to design and develop a functional, scalable, and user-friendly e-commerce platform specifically for beauty products. The detailed objectives include:

- To create an online storefront focusing on beauty and personal care items
- To implement category-based product filtering and search functionality
- To design a responsive and mobile-friendly user interface
- To provide a secure cart and checkout experience

1.4 Scope and Limitations

Scope:

- The platform will focus on beauty products such as skincare, haircare, and makeup.
- Users can browse products, create accounts, add items to cart, and place orders.
- Admin users can manage inventory, orders, and product listings.
- The application is hosted locally using **Vite** in **Visual Studio Code**, with scalability in mind for future live deployment.

Limitations:

- The platform currently supports only local hosting and lacks live payment gateway integration.
- Delivery management and real-time order tracking are not included.
- Limited product analytics and customer review systems are implemented at this stage.
- Mobile app integration is not part of this phase.

1.5 Development Methodology

The project follows the **Agile Development Methodology**, which enables iterative development, continuous feedback, and quick adaptation to changes. Key features of this approach include:

- **Sprint-Based Development:** The work was broken down into small, manageable sprints focusing on individual features like authentication, product display, and cart logic.
- **Regular Testing:** After each sprint, functionality was tested across different screen sizes and browsers.
- **User Feedback Integration:** Feedback from test users was used to enhance usability and fix minor bugs.
- **Version Control:** Git was used for version management and collaboration.

This approach allowed efficient collaboration, early identification of issues, and progressive enhancement of the application.

CHAPTER 2: LITERATURE REVIEW

2.1 Current Status

Nepal's E-commerce, or electronic commerce, has revolutionized the way businesses and consumers interact. The rise of online shopping has allowed customers to access products and services anytime, anywhere, using digital platforms. The beauty and personal care sector, in particular, has been significantly influenced by this shift, with consumers increasingly relying on online sources for their cosmetic needs.

2.2 E-Commerce in the Beauty Industry

Globally, beauty products have become some of the most searched and purchased items online. Consumers look for convenience, product variety, and the ability to compare brands and prices. According to multiple studies, a specialized approach in e-commerce—where platforms are designed for specific industries—enhances the overall shopping experience by offering focused product selections, better categorization, and relevant content.

In Nepal, platforms like Daraz have made online shopping more accessible, but they cater to a wide range of products and do not offer a niche shopping experience for beauty-focused customers. This creates a gap in the market for a dedicated platform tailored to skincare, makeup, haircare, and wellness..

2.3 Local Context and Relevance

While Nepal's e-commerce adoption is still growing, the demand for niche platforms is rising. Consumers seek specialized marketplaces that offer quality, reliability, and trust—especially in sectors like beauty, where authenticity and product descriptions are critical. Rupali Beauty Point is designed to meet this demand, drawing on global best practices while tailoring the experience to local expectations.

CHAPTER 3: SYSTEM ANALYSIS AND DEVELOPMENT TOOLS

3.1 System Analysis

Before initiating the development of **Rupali Beauty Point**, a comprehensive system analysis was conducted to ensure technical feasibility, operational clarity, and market relevance. The analysis involved evaluating user needs, market gaps, technology choices, and scalability considerations.

Feasibility Analysis:

Aspect	Details
Technical	Developed using a full-stack approach with **React.js** for frontend, **Node.js** and **Express.js** for backend, and **MongoDB** as the database.
Operational	Easy management via admin dashboard, minimal training required.
Financial	Built using open-source tools and libraries, keeping development cost low.
Market	Addresses a niche in the Nepali market lacking specialized online beauty platforms.
Legal	Complies with local digital commerce norms; ready for integration with local payment APIs like eSewa.

3.2 Development Tools and Best Practices

Development Tools:

- **Version Control: Git & GitHub**
  - Git was used as the primary version control system to track changes in source code.
  - GitHub hosted the repository, enabled collaboration, and managed issues via branches and pull requests.

- **Testing Tools**
  - Manual testing was conducted regularly in Google Chrome and Mozilla Firefox to ensure cross-browser compatibility.
  - Basic test cases were written and executed for features like login, cart management, and API response handling.
- **Deployment Platforms (Planned)**
  - Vercel (or Netlify) was selected for frontend deployment due to its ease of use and continuous deployment features.
  - Render was planned for backend hosting, offering a reliable environment for Node.js and MongoDB integration.
- **Project Management: Agile Methodology**
  - The team adopted Agile principles, using Kanban boards and sprints to break development into manageable tasks.
  - Regular reviews and task assignments promoted better planning and continuous improvement.

Best Practices Followed:

- **Modular Architecture**
  - The project was designed using a modular structure, separating concerns across components, pages, services, and APIs.
  - Backend followed the MVC (Model-View-Controller) pattern to improve code organization and scalability.
- **Responsive Web Design**
  - Mobile-first design principles were followed to ensure that the UI adapts well across devices.
  - Guidelines were referenced from MDN Web Docs and Google's Material Design, ensuring accessibility and usability.
- **Security Standards**
  - **Security was a key focus area:**
    - Used JWT (JSON Web Tokens) for secure authentication and route protection.
    - Implemented input sanitization and form validation to protect against XSS and injection attacks.
    - Referenced OWASP security best practices for API development and data protection.
- **Code Quality**
  - Clean code principles were followed, with consistent naming conventions and reusable components.
  - Comments and documentation were included in key areas to enhance readability and maintainability.

CHAPTER 4: SYSTEM DESIGN AND FEATURES

4.1 INTRODUCTION

It provides a detailed overview of the system design and features implemented for the Rupali Beauty Point e-commerce website. It focuses on the architecture of the application, the design choices made for the frontend and backend, and the user-centric features that enhance the shopping experience. The goal of this chapter is to showcase how the system's design aligns with the requirements of the users and ensures a seamless, secure, and scalable platform.

System Design

The platform architecture follows a modular full-stack structure that separates the frontend, backend, and database layers. This ensures easier debugging, faster updates, and better scalability.

Frontend:

- Developed using **React.js** with **Vite** as the build tool for faster development and hot module replacement.
- Styled with **CSS modules** and component-based design to ensure responsiveness and clean UI across all screen sizes.
- Utilizes **Axios** for RESTful API calls between frontend and backend.

Backend:

- Built using **Node.js** and **Express.js**, providing REST APIs for user authentication, product management, cart, and order handling.
- JWT-based **authentication** system for secure login and route protection.
- Integration-ready for local payment gateways.

Database:

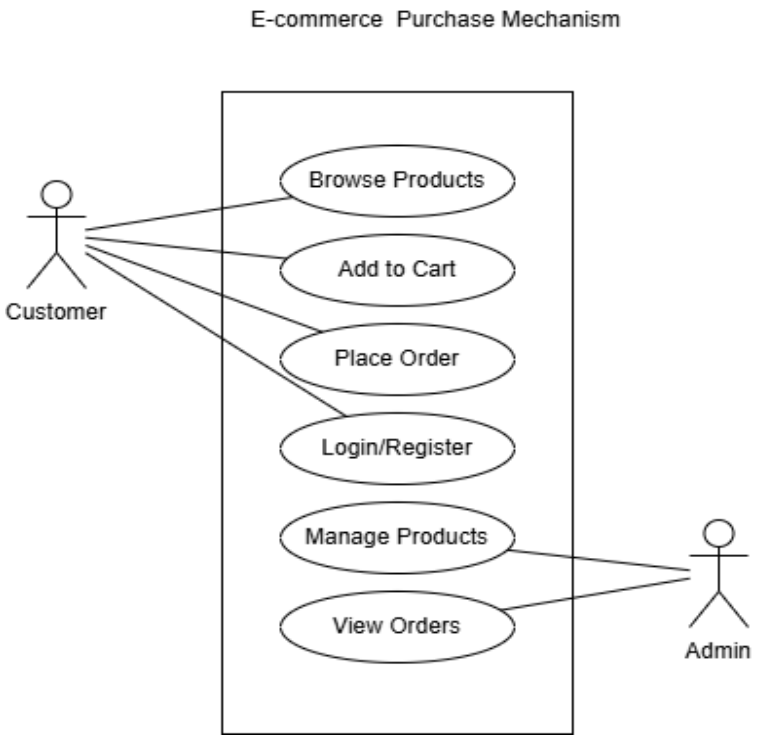
- **MongoDB** serves as the NoSQL database, storing data on products, users, orders, and cart sessions in a flexible schema.

4.1.1 Use Case Diagram:

The system includes roles for:

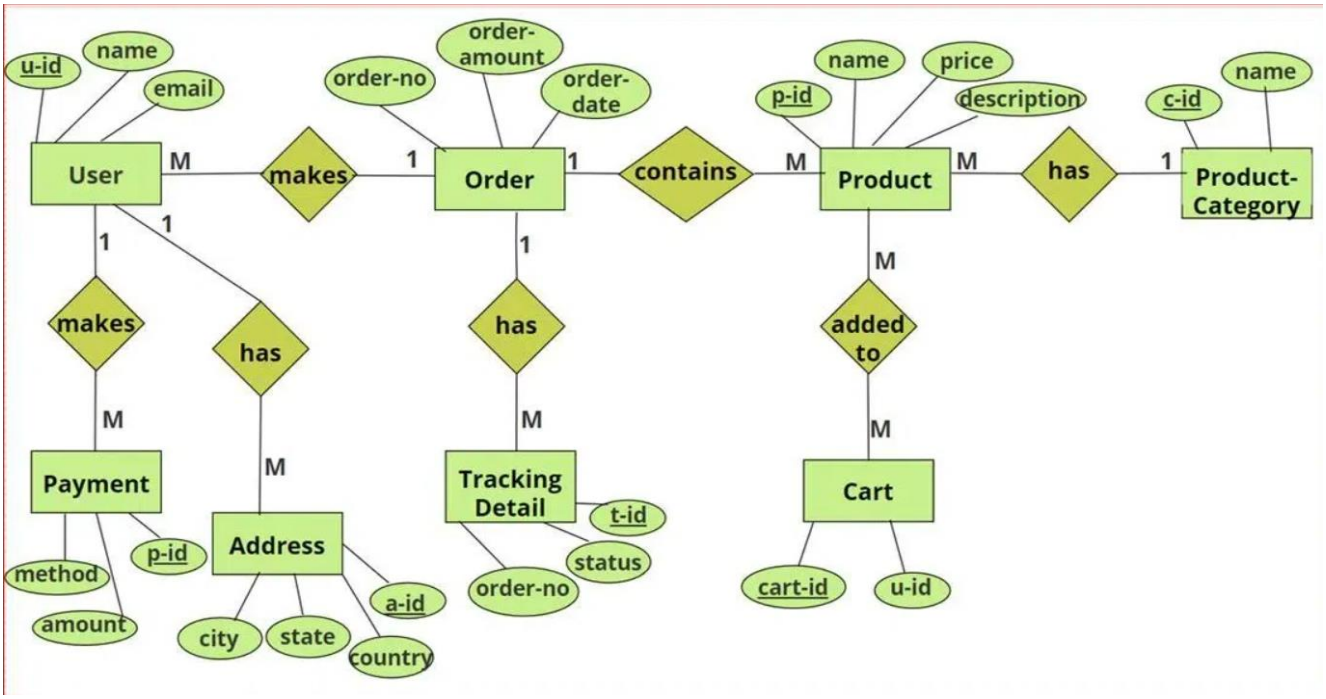
- **Customers**: Register, log in, view products, add to cart, place orders.

- **Admins**: Add/edit/delete products, view orders, manage inventory.



4.1.2 Entity Relationship Diagram (ERD):

An ERD is a visual representation of how different entities in your database relate to each other. In the context of your e-commerce website, it would show the relationships between entities like **users**, **products**, **orders**, and **categories**. For example, it would show that a user can have multiple orders, and an order contains multiple products. This diagram helps in understanding the database structure and ensures data integrity.



4.1.3 Activity Diagram:

The activity diagram provides a dynamic view of the user's interaction with the Rupali Beauty Point e-commerce system. It outlines the sequence of activities a user typically performs from visiting the website to successfully placing an order. The flow begins when the user opens the website and starts browsing through available products. Upon selecting a product, the system displays its detailed information. The user can then choose to add the item to their shopping cart and proceed to the checkout process.

If the user is not logged in, the system prompts them to either log in or register. Once authenticated, the user can confirm their order. The backend then processes the order, and the system displays a confirmation message, completing the transaction.

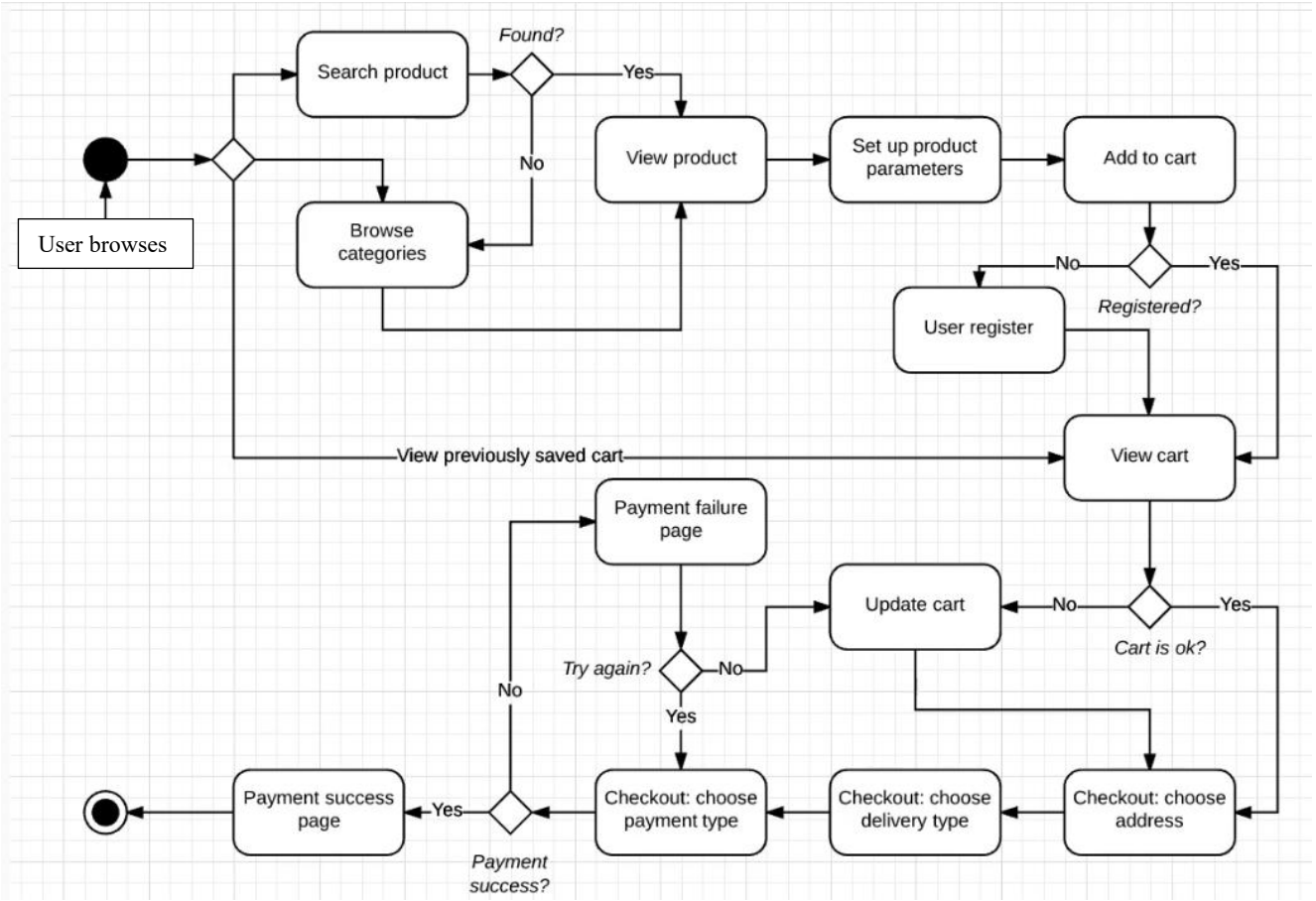


Fig: Activity Diagram of Rupali Beauty Point

4.2 Features of the Website

The Rupali Beauty Point e-commerce website integrates several key features designed to offer an engaging and seamless shopping experience for users:

1. **User Registration and Login**: JWT-based authentication ensures that users can securely sign up and log in to their accounts. Authenticated users can manage their profiles and view their order history.
2. **Product Catalog and Search**: The product catalog is organized into categories such as skincare, haircare, and makeup. Users can filter products by category, price, and other attributes. A real-time search bar enhances navigation.
3. **Product Detail Page**: Each product's detail page displays comprehensive information, including product images, descriptions, prices, and other relevant details. The page is dynamically populated from the backend.
4. **Cart and Checkout**: A persistent shopping cart allows users to add, update, and remove items. Upon checkout, users can review their orders and proceed with confirmation.
5. **Admin Panel**: Admin users have access to a secure admin panel where they can manage products (CRUD operations), monitor orders, and perform basic inventory management.
6. **Responsive Design**: The website's design is mobile-first, ensuring that the site is accessible and usable on a variety of devices, from desktop computers to smartphones.
7. **API Communication**: Frontend and backend communication is handled via Axios, which allows the frontend to fetch data, submit forms, and handle authentication seamlessly.
8. **Client-side Routing**: React Router DOM is used to implement client-side routing, enabling smooth, page-less navigation throughout the website.

CHAPTER 5: SYSTEM IMPLEMENTATION AND TESTING

5.1 IMPLEMENTATION

The implementation was carried out in a modular and iterative approach, allowing for continuous testing and refinement of each feature. The application follows a full-stack architecture with separate layers for frontend, backend, and database communication.

5.1.1 Frontend Implementation

- Developed using **React**, with components for key pages like Home, Product Details, Cart, and Checkout.
- UI design followed a **mobile-first approach** using CSS modules and reusable components.
- Client-side routing was handled by **React Router DOM** to ensure smooth navigation without page reloads.
- Axios was used to communicate with the backend API.

5.1.2 Backend Implementation

- Built using **Node.js** and **Express.js**, with a clear separation of concerns using route and controller files.
- Implemented **JWT-based authentication** for user login and registration.
- RESTful APIs were created for managing users, products, orders, and categories.
- Error handling and validation were incorporated using middleware.

5.1.3 Database Integration

- Used **MongoDB** with **Mongoose** for schema design and data modeling.
- Created collections for users, products, orders, and categories.
- Indexed key fields like email and product name for faster lookups and queries.

TESTING METHODOLOGIES

Testing ensures that the chatbot functions correctly and meets user expectations. It explains the different types of testing conducted to ensure the chatbot's functionality, security, and efficiency. The testing phases include:

5.2.1 **Unit Testing**:

- Small units of logic, such as input validation, were tested using simple test cases during development.
- Example: Ensuring price input only accepts numerical values greater than zero.

5.2.2 Integration Testing

- Verified that components (e.g., login + cart, product page + checkout) worked together correctly.
- APIs were tested using tools like **Postman** to confirm correct responses and error handling.

5.2.3 User Testing

- It Informal user testing was done by a group of peers who tested the site on various devices.
- Feedback was collected and used to fix layout issues, broken links, and usability problems.

CHAPTER 6: CHALLENGES

Developing Every software project comes with its own set of challenges. During the development of the Rupali Beauty Point e-commerce website, several technical and design-related obstacles were encountered. This chapter outlines the key challenges faced and the strategies used to resolve them effectively. Identifying and overcoming these issues not only improved the functionality and user experience of the website but also contributed to the overall learning and development process.

6.1 Technical Challenges

- **JWT Authentication Issues**
  - Problem: Token expiration and validation errors.
  - Solution: Implemented proper middleware and client-side token handling.
- **Cart Persistence**
  - Problem: Cart reset after page refresh or logout.
  - Solution: Used local storage and synced data with backend upon login.
- **Responsive Design Bugs**
  - Problem: Layout broke on mobile screens.
  - Solution: Applied mobile-first CSS and tested across various devices.
- **Slow Product Filtering**
  - Problem: Lag when filtering products by category/price.
  - Solution: Added MongoDB indexes and optimized queries.
- **Form Validation Errors**
  - Problem: Backend received invalid data from forms.
  - Solution: Added client-side validation and backend checks using express-validator.

6.2 Design and UX Challenges

- **Overloaded Admin Panel**
  - Problem: Too much information shown at once.
  - Solution: Reorganized into cleaner sections with collapsible tabs.
- **Navigation Confusion**
  - Problem: Users struggled to find key pages like Cart or Home.
  - Solution: Redesigned header/footer with clearer links and icons.
- **Lack of Action Feedback**
  - Problem: Users weren’t sure if clicks like “Add to Cart” worked.
  - Solution: Added toast alerts and loading animations for better feedback.

CHAPTER 7: CONCLUSION AND FUTURE RECOMMENDATIONS

7.1 CONCLUSION

The development of **Rupali Beauty Point**, a full-stack e-commerce platform, successfully met its objective of providing a user-friendly, secure, and scalable solution for online beauty product shopping. Through the integration of modern web technologies such as **React**, **Node.js**, **Express**, and **MongoDB**, the platform offers a seamless experience for both customers and administrators.

Key achievements include:

- A responsive user interface that adapts to all device sizes.
- Secure authentication and authorization using JWT.
- Efficient product management and order handling via a dedicated admin panel.
- Modular design and RESTful APIs that support future feature expansion.

The project not only improved the team's technical and problem-solving skills but also deepened the understanding of real-world full-stack web development, from planning and design to testing and deployment.

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7.2 SCOPE FOR FUTURE DEVELOPMENT

Despite the achievements of this project, there remains ample opportunity for enhancement. Some key recommendations for future work include:

- **Payment Gateway Integration:**
  Incorporate services like Khalti, eSewa, or Stripe to enable secure online payments.

- **User Reviews and Ratings:**
  Allow users to leave feedback and rate products to build trust and guide others in their purchasing decisions.

- **Delivery Tracking System:**
  Integrate a tracking system to keep users informed about the status and location of their orders.

- **Progressive Web App (PWA) Support:**
Convert the platform into a PWA to improve performance on mobile devices and allow offline access.

- **Automated Email Notifications:**
Implement email alerts for order confirmation, shipping updates, and promotions.

- **Inventory and Sales Analytics:**
Include dashboards for administrators to monitor stock levels, sales trends, and customer behavior.

- **Multilingual Support:**
Add language options to cater to a diverse customer base, especially in multi-lingual regions.

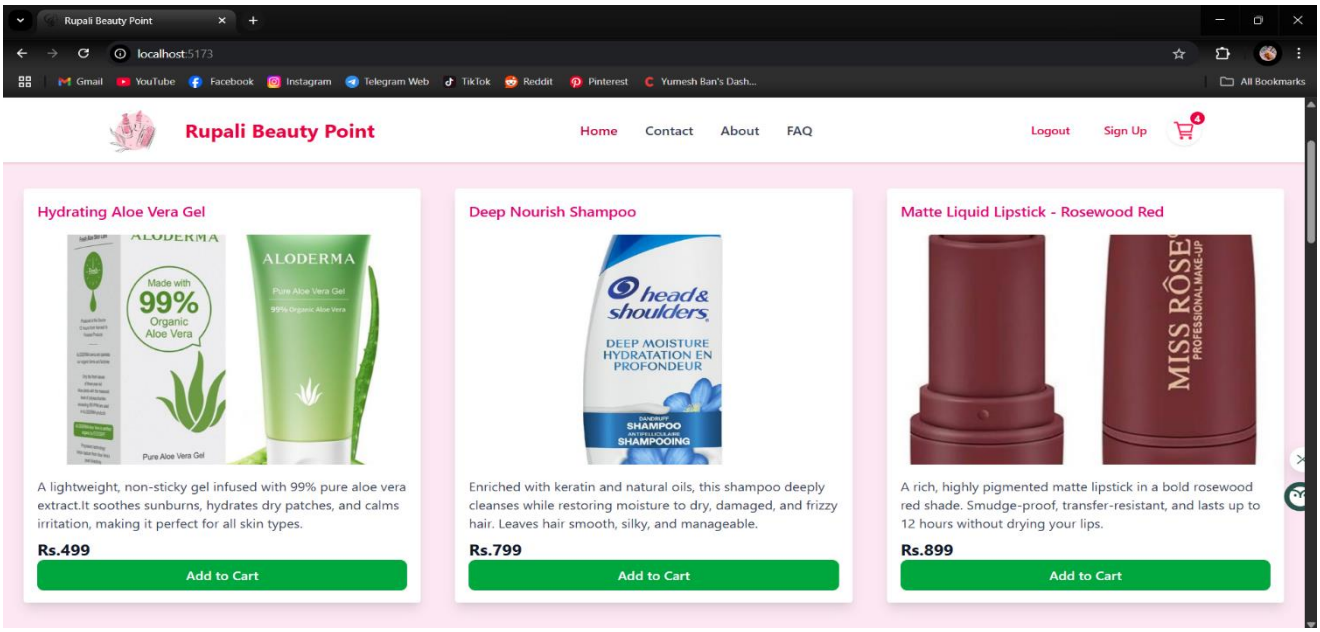
This project marks the beginning of a scalable e-commerce solution tailored for beauty products. With the foundation firmly in place, the system can now evolve through thoughtful enhancements and innovation, ensuring it continues to meet user expectations and business goals in the future.

APPENDIX

The screenshots were taken from the desktop version of the site:

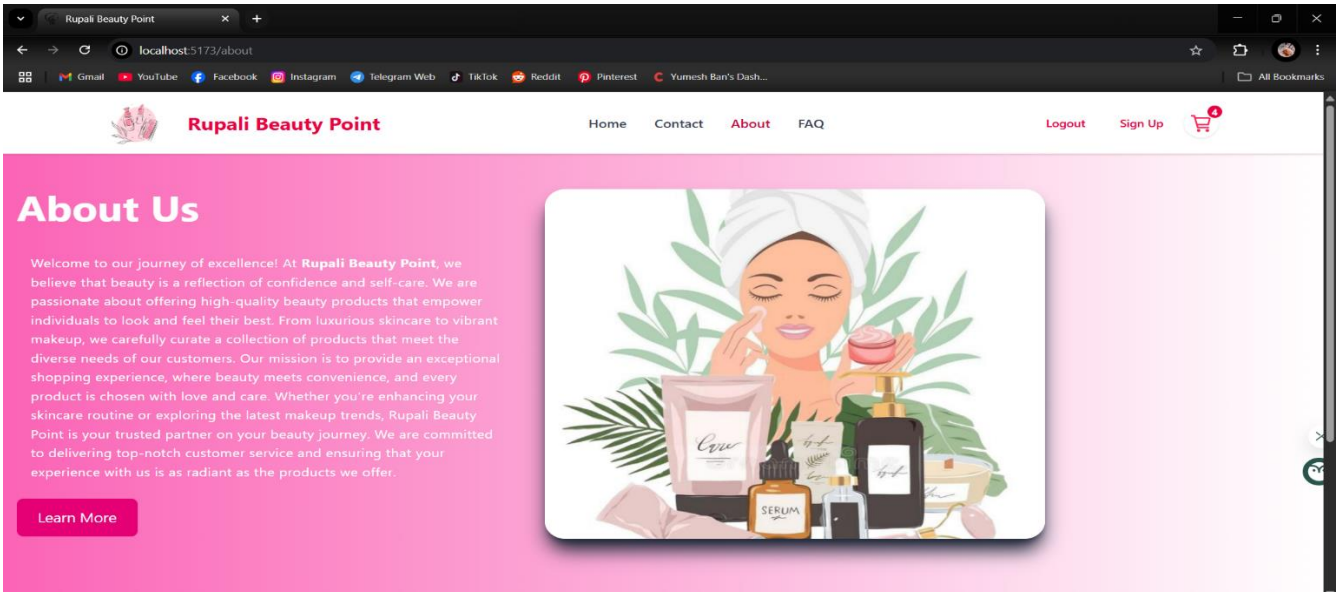
Homepage(Desktop):

Clean layout with hero banner, services overview, and quick links.



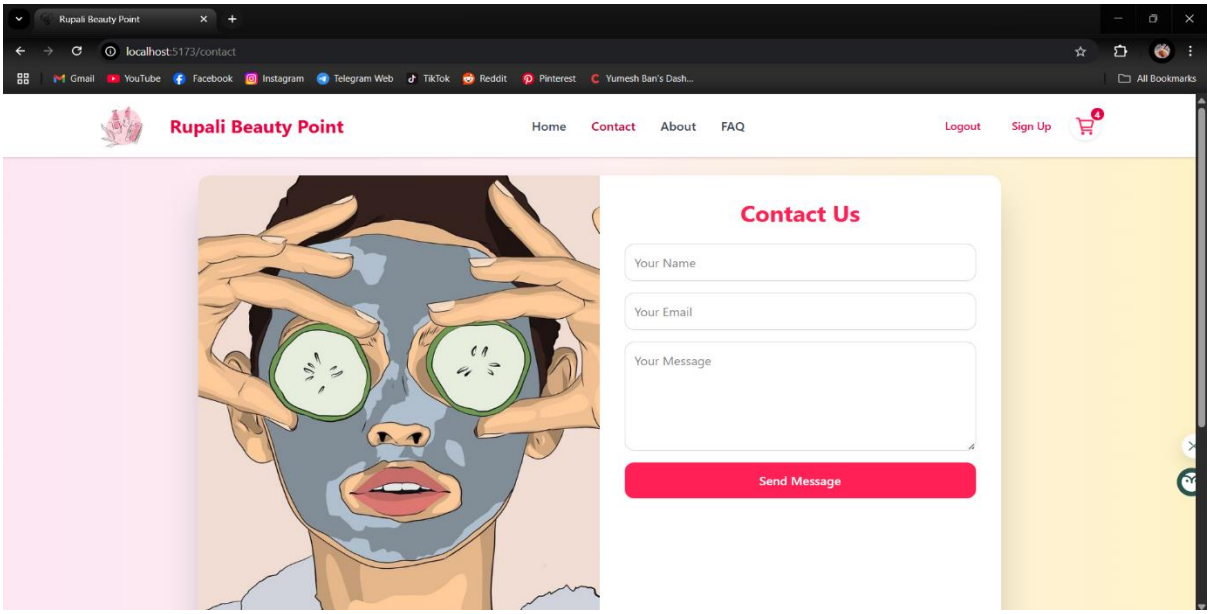
About Us:

About the Rupali Beauty Point,



Contact:

About the Rupali Beauty Point Contact and connection,



FAQ :

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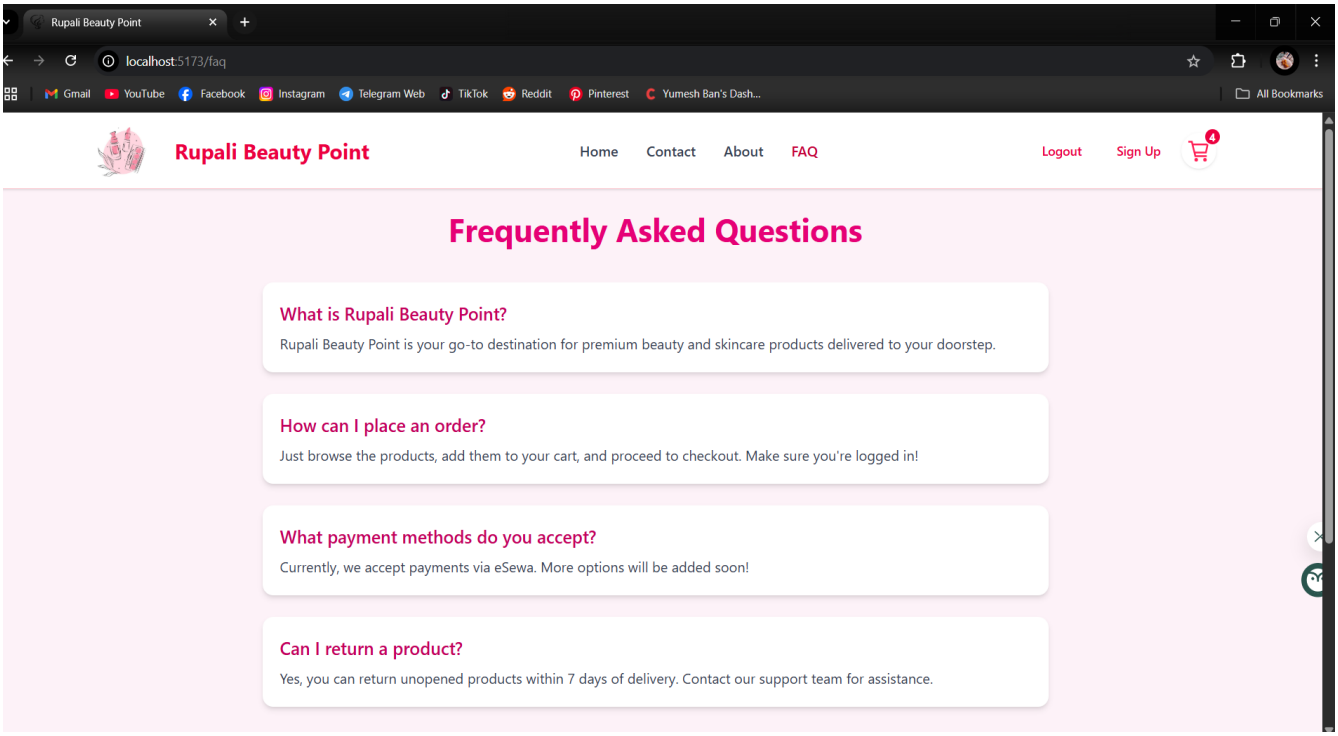
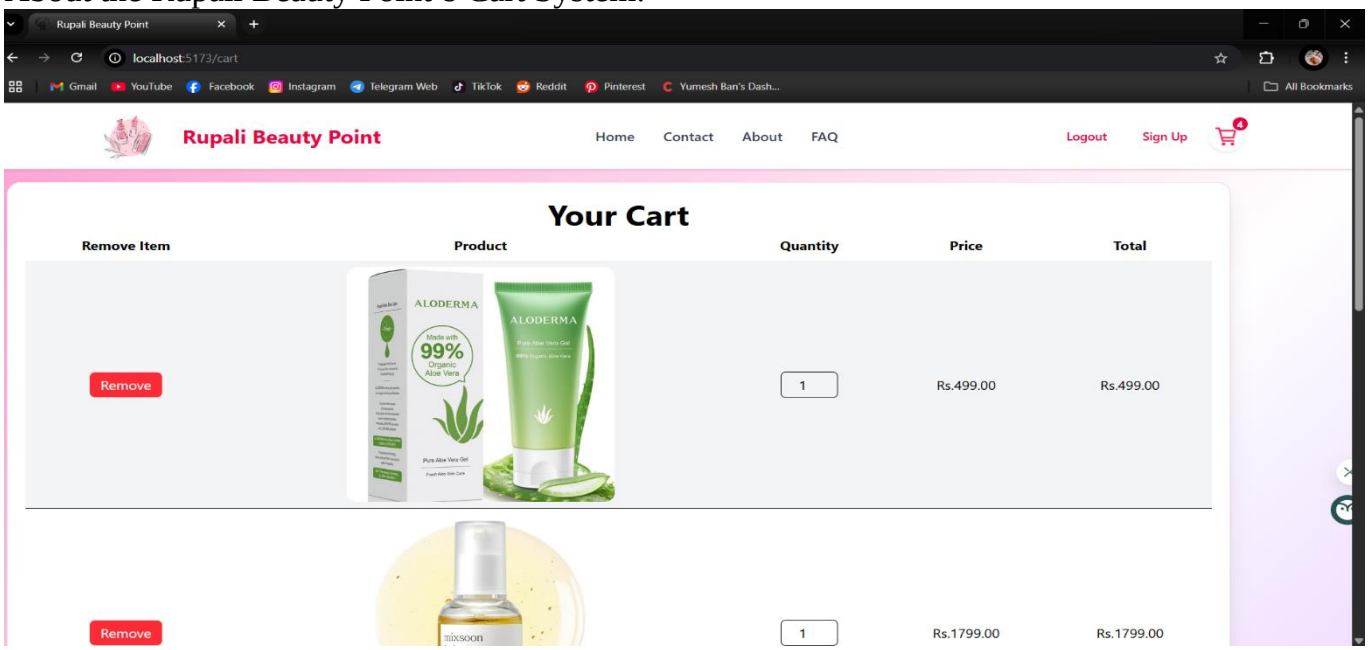


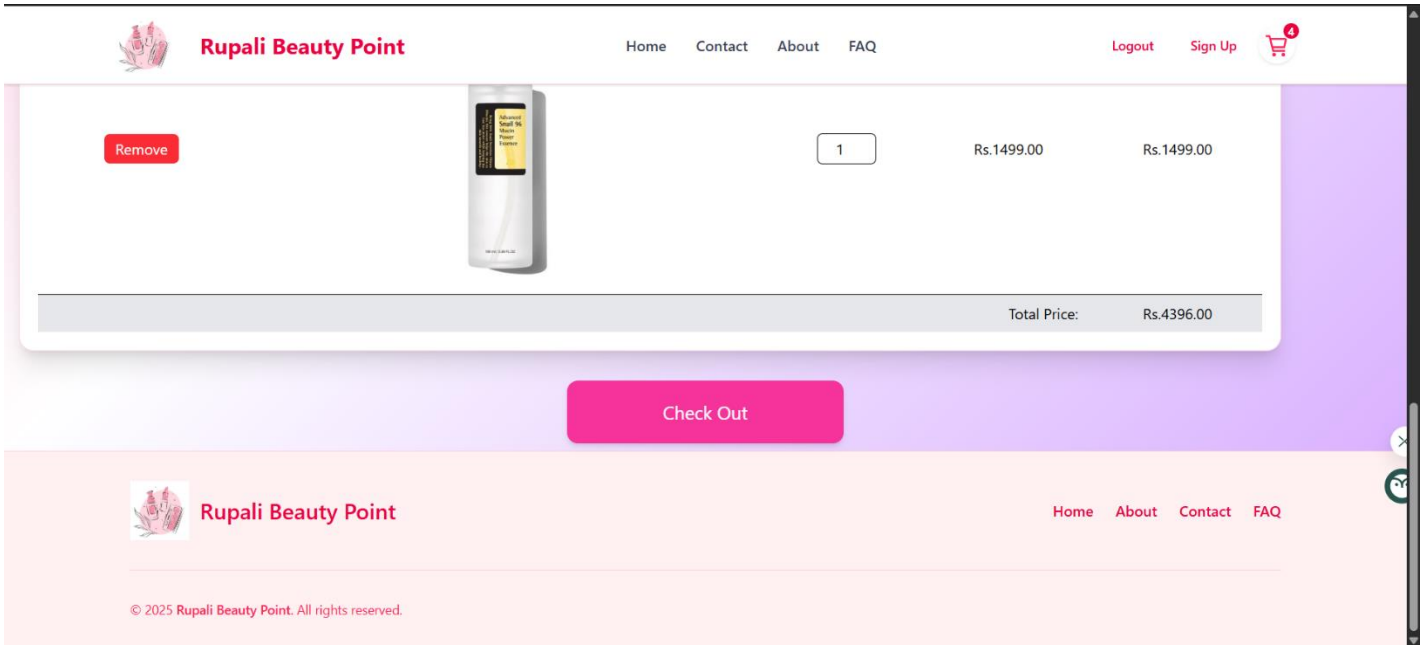
Cart:

About the Rupali Beauty Point's Cart System:



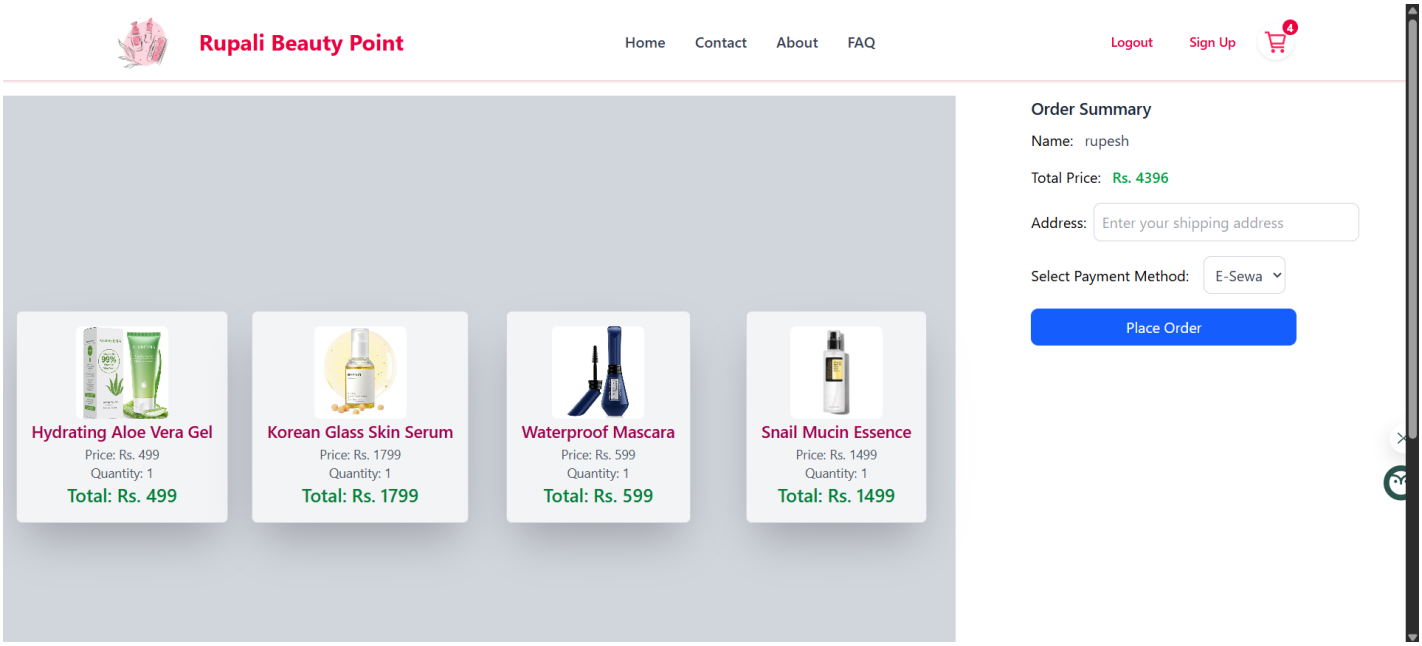
Checkout:

About the Rupali Beauty Point's Checkout System



Order Summary:

About the Rupali Beauty Point's Finalization:



Payment Gateway:

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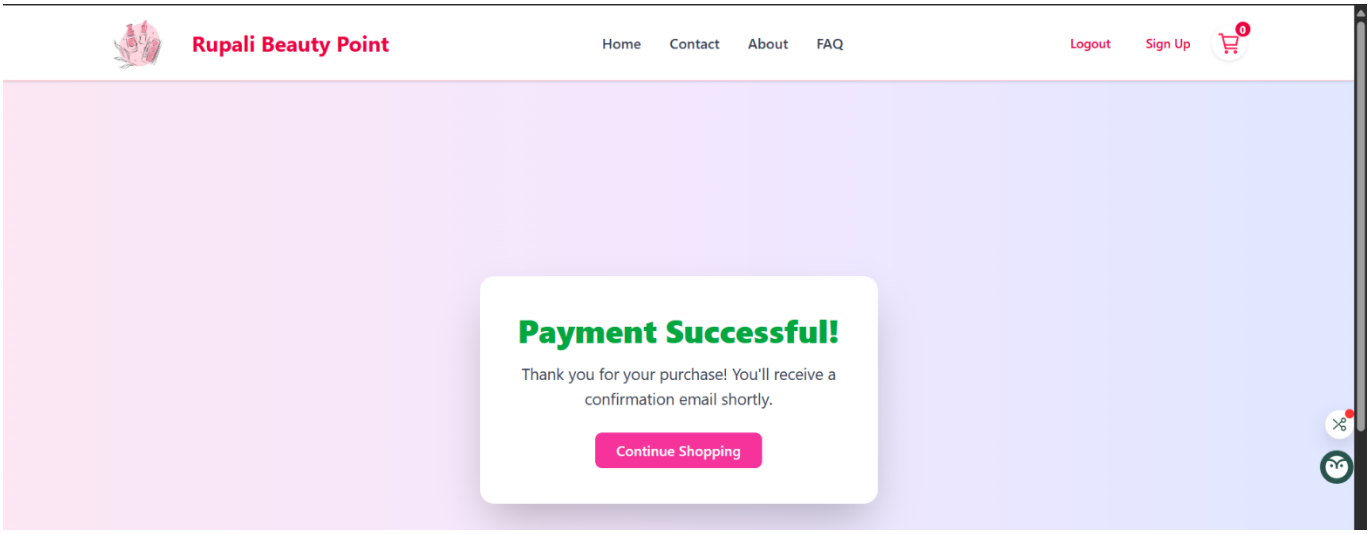

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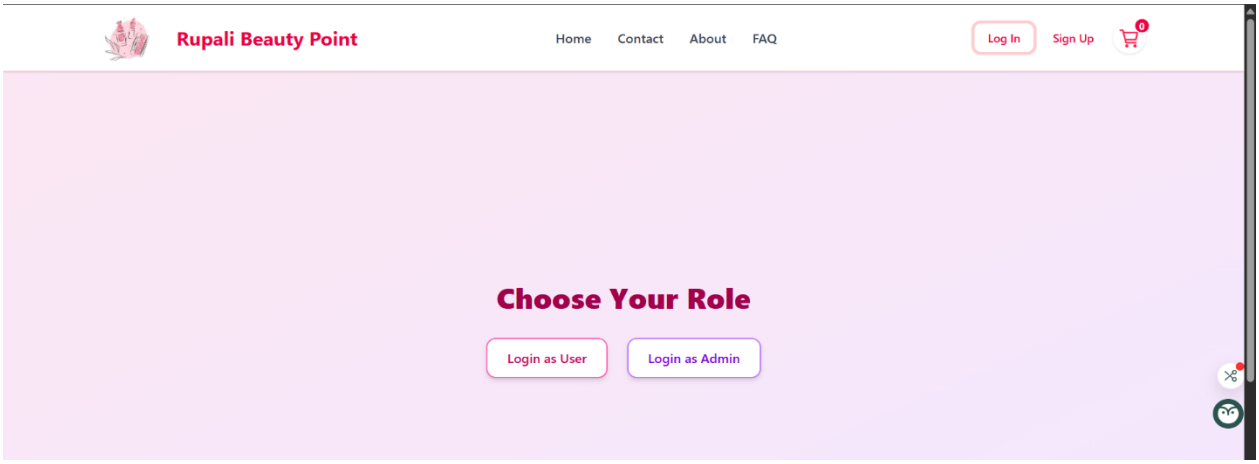

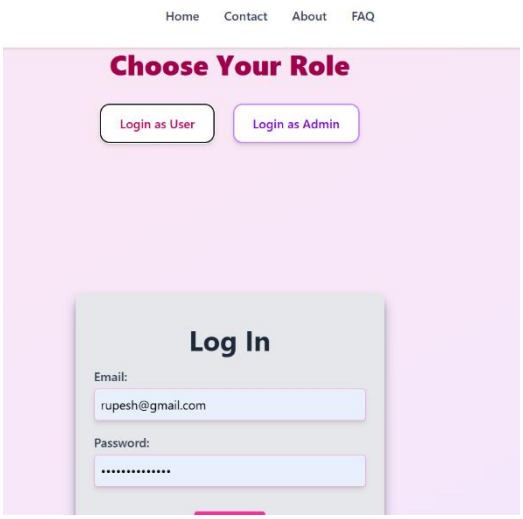

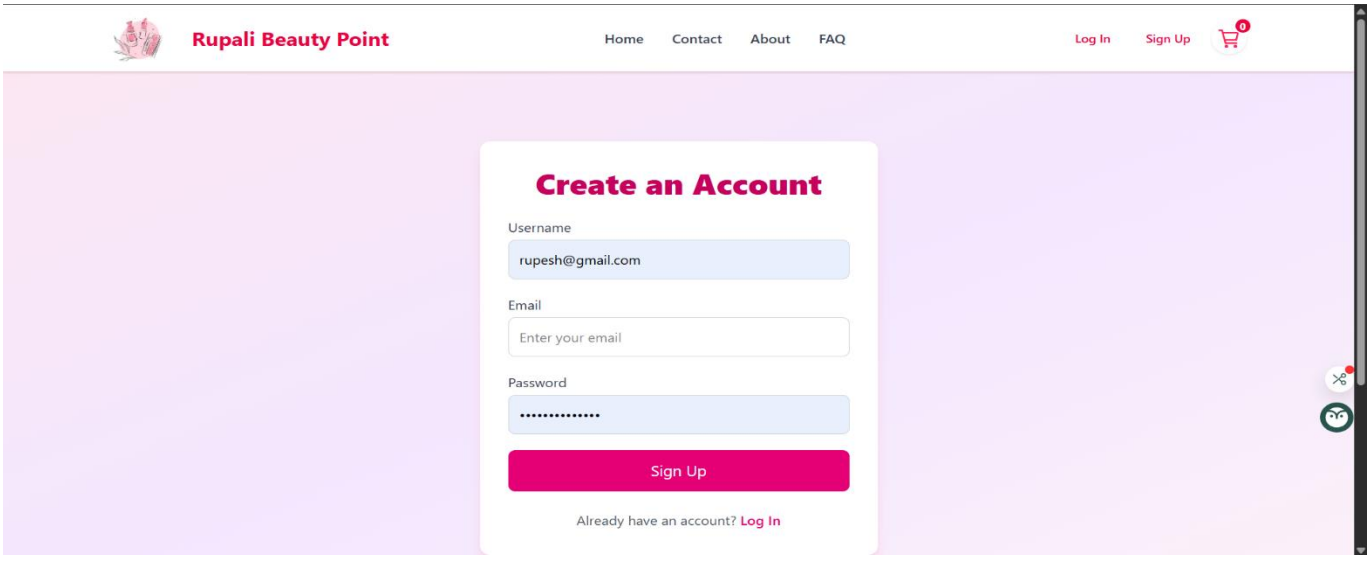

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