INSTITUTE FOR ADVANCED COMPUTING AND SOFTWARE DEVELOPMENT, AKURDI, PUNE

Handy-Mart E-Commerce Web Application

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Submitted By:
Group No: 32

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Centre Coordinator

ABSTRACT

The Handy-Mart E-Commerce Web Application project aims to develop a user-friendly, scalable, and secure online platform that facilitates the buying and selling of a wide range of products. The application is designed to provide customers with a seamless shopping experience, from browsing products to completing transactions, while ensuring that merchants can efficiently manage their inventory, orders, and customer interactions.

Handy-Mart is an e-commerce platform catering to a diverse customer base, offering a variety of products including electronics, fashion, home goods, and groceries. The web application will be built using modern web technologies to ensure responsiveness, accessibility, and performance. The project will focus on delivering an intuitive user interface, robust backend services, and secure payment processing.

The Handy-Mart E-Commerce Web Application will provide a comprehensive solution for online shopping, offering an excellent user experience, advanced features for merchants, and robust security measures. This project is expected to significantly improve the accessibility and convenience of e-commerce for a broad audience, positioning Handy-Mart as a leading platform in the digital marketplace.

ACKNOWLEDGEMENT

I take this occasion to thank God, almighty for blessing us with his grace and taking our endeavor to a successful culmination. I extend my sincere and heartfelt thanks to our esteemed guide, Mr. Harshal Waghchaure for providing me with the right guidance and advice at the crucial juncture sand for showing me the right way. I extend my sincere thanks to our respected Centre Co-Ordinator Mr. Rohit Puranik, for allowing us to use the facilities available. I would like to thank the other faculty members also, at this occasion. Last but not the least, I would like to thank my friends and family for the support and encouragement they have given me during the course of our work.

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1. INTRODUCTION

In today's digital age, e-commerce has become a pivotal aspect of consumer behavior, reshaping how people shop and interact with businesses. The Handy-Mart E-Commerce Web Application Project is conceived as a response to this growing trend, aiming to create a cutting-edge online platform that bridges the gap between customers and merchants. The project focuses on delivering a seamless, intuitive, and secure shopping experience for users while providing merchants with the tools they need to efficiently manage their business operations.

Handy-Mart aspires to be more than just an online store—it aims to be a comprehensive marketplace where a diverse range of products, from electronics and fashion to home goods and groceries, are easily accessible to a wide audience. The platform will leverage modern web technologies to ensure high performance, scalability, and adaptability to future needs.

Handy-Mart E-Commerce Web Application Project represents a significant step towards creating a versatile and user-centered e-commerce platform that can meet the expectations of today's digital-savvy consumers and empower merchants to thrive in a competitive marketplace.

1.1 Purpose

The purpose of this document is to provide a detailed specification of the features and functionalities of the " Handy-Mart " It outlines the requirements, system architecture, and user-interactions.

1.2 Scope

The Handy-Mart E-Commerce Web Application Project encompasses the design, development, deployment, and maintenance of a comprehensive online marketplace.

The scope of the Handy-Mart E-Commerce Web Application Project includes the design, development, deployment, and maintenance of a comprehensive online marketplace that facilitates seamless transactions between customers and merchants.

1.3 Objective of Project on Handy-Mart:

The primary objective of the Handy-Mart E-Commerce Web Application Project is to create a user-friendly, secure, and scalable online platform that enables seamless transactions between customers and merchants.

The project aims to provide customers with a convenient and personalized shopping experience, while empowering merchants with tools to efficiently manage their products, orders, and customer interactions. The project will cover key functionalities such as user management, product cataloging, shopping cart and checkout processes, order management, and a merchant dashboard for inventory and sales analytics.

Additionally, the scope includes implementing robust security measures, ensuring scalability, and providing customer support features like live chat and a ticketing system. The project will be deployed on cloud infrastructure, with a focus on performance, security, and compliance with data protection regulations.

1.4 Functionalities provided by Handy-Mart are as follows:

The Handy-Mart E-Commerce Web Application Project will deliver a wide range of functionalities to ensure a seamless and efficient shopping experience for customers and robust management capabilities for merchants. Key functionalities include:

1. User Authentication and Account Management:
   - **Customer Accounts:** Secure registration, login, and profile management for customers, including order history and personal information updates.
   - **Merchant Accounts:** Separate accounts for merchants to manage their stores, including product listings, orders, and customer interactions.

2. Product Catalog Management:
   - **Product Listings:** Merchants can add, update, and manage product information, including descriptions, images, pricing, and inventory levels.
   - **Search and Filtering:** Advanced search functionality with filtering options such as category, price range, brand, and ratings.
   - **Product Recommendations:** Dynamic recommendations based on customer behaviour, preferences, and browsing history.

3. Shopping Cart and Checkout:
   - **Shopping Cart:** Persistent shopping cart feature allowing users to add, remove, and modify items before purchase.
   - **Checkout Process:** A multi-step checkout process, including shipping options, payment methods, and order confirmation.
   - **Payment Gateway Integration:** Secure integration with multiple payment gateways to support various payment methods, including credit/debit cards and digital wallets.

4. Order Management:
   - **Order Tracking:** Real-time tracking of orders, providing customers with updates on order status, shipping, and delivery**.**

- **Order History:** Access to detailed order history for both customers and merchants, including options for returns and refunds.
- **Payment Gateway Integration: Invoice Generation:** Automated invoice generation for each transaction, accessible within user accounts and sent via email.

5. Vendor Dashboard:
   - **Inventory Management:** Tools for managing product stock, including alerts for low inventory levels.
   - **Sales Analytics:** Detailed reports and insights into sales performance, customer behavior, and inventory turnover.
   - **Promotions and Discounts:** Ability for vendors to create and manage special offers, discount codes, and promotional campaigns.

6. Performance and Scalability:
   - **Responsive Design:** Ensuring the application is fully responsive and performs well across various devices, including desktops, tablets, and smartphones.
   - **Scalability:** The platform is designed to scale with increasing user traffic and transaction volumes, with provisions for future growth.
   - **Load Balancing:** Implementation of load balancing to distribute traffic evenly across servers, enhancing reliability and performance.

These functionalities will collectively provide a robust, user-friendly, and secure e-commerce platform that meets the needs of both customers and merchants, fostering a thriving online marketplace.

2. REQUIREMENTS

Functional Requirements

FR 1. User Registration and Authentication:

- Users can register by providing necessary details.
- User authentication is required to access the system.

FR 2. Vendor Registration and Authentication:

- Vendors can register by providing necessary details.
- Vendor authentication is required to access the system.

FR 3. Administrator Application:

- Administrators can approve or accept Vendor application.
- After Approved, Vendor will be able to List the Products.

FR 4. User Profiles:

- Users can view and update their profiles.
- User profiles store personal information, contact details.

FR 5. Error Handling and Reporting:

- The system handles errors gracefully and provides appropriate error messages.
- Admins can access logs and error reports for troubleshooting

Non-Functional Requirements:

NFR 1. Security:

- User passwords are securely stored using encryption techniques.
- Access controls ensure that users can only access authorized features.

NFR 2. Performance:

- The system should handle a large number of simultaneous users without significant slow-downs.
- Image loading and retrieval should be efficient for a smooth user experience.

NFR 3. Scalability:

- The system should be designed to accommodate future growth and increased user activity.

NFR 4. Usability:

- The user interface should be intuitive and user-friendly for both customers and administrators.
- Clear and concise error messages should guide users through any issues.

NFR 5. Reliability:

- The system should be available and operational 24/7 with minimal downtime.

NFR 6. Data Integrity:

- Data integrity and consistency are maintained through proper validation and database design.

NFR 7. Data Privacy:

- User data, especially personal and sensitive information, should be stored securely.

Other Requirements:

Hardware and Network Interfaces:

Back-end Server Configuration:

- Intel Pentium-IV Processor
- 128 MB RAM

Front-end Client Configuration:

- Intel Pentium-III @ 650 MHz Processor
- 128 MB SDRAM
- 10 GB Hard Disk Drive
- 104 Keys Keyboard
- PS2 Mouse with pad

Software Interfaces:

Software configuration for back-end Services:

- Java EE – 17
- Spring Boot, JPA – 3.2.2
- MySQL - 8.0.36
- STS 3.9.18

Software configuration for front-end Services:

- ReactJS – 18.2.0
- Bootstrap – 5.3.2
- VS Code - 1.92.2

3. DATABASE DESIGN

Database Design

The following table structures depict the database design.

Customer (customers)

	Field	Type	Null	Key	Default	Extra
▶	customer_id	int	NO	PRI	NULL	auto_increment
	address	varchar(255)	YES		NULL	
	email	varchar(255)	YES		NULL	
	firstname	varchar(255)	YES		NULL	
	lastname	varchar(255)	YES		NULL	
	phone	varchar(255)	YES		NULL	
	login_id	int	YES	UNI	NULL	

Login (users)

	Field	Type	Null	Key	Default	Extra
▶	login_id	int	NO	PRI	NULL	auto_increment
	password_hash	varchar(255)	YES		NULL	
	status_approve	bit(1)	YES		NULL	
	username	varchar(255)	YES		NULL	
	role_id	int	YES	MUL	NULL	

Role (roles)

	Field	Type	Null	Key	Default	Extra
▶	role_id	int	NO	PRI	NULL	
	role_name	varchar(255)	YES		NULL	

Product Category (productcategory)

	Field	Type	Null	Key	Default	Extra
▶	category_id	int	NO	PRI	NULL	
	active_flag	bit(1)	YES		NULL	
	category_name	varchar(255)	YES		NULL	

Sub Product Category (subproductcategory)

Field	Type	Null	Key	Default	Extra
subcategory_id	int	NO	PRI	NULL	auto_increment
subcategory_name	varchar(255)	YES		NULL	
category_id	int	YES	MUL	NULL	

Vendor (vendors)

Field	Type	Null	Key	Default	Extra
vendor_id	int	NO	PRI	NULL	auto_increment
address	varchar(255)	YES		NULL	
aadharnumber	varchar(255)	YES		NULL	
email	varchar(255)	YES		NULL	
firstname	varchar(255)	YES		NULL	
lastname	varchar(255)	YES		NULL	
phone	varchar(255)	YES		NULL	
skillset	varchar(255)	YES		NULL	
login_id	int	YES	UNI	NULL	

Vendor Product (vendorproducts)

Field	Type	Null	Key	Default	Extra
vendor_product_id	int	NO	PRI	NULL	auto_increment
active_flag	bit(1)	NO		NULL	
description	varchar(255)	YES		NULL	
inventory	int	NO		NULL	
price	float	NO		NULL	
productname	varchar(255)	NO		NULL	
subcategory_id	int	YES	MUL	NULL	
vendor_id	int	YES	MUL	NULL	

Cart (cart)

Field	Type	Null	Key	Default	Extra
cart_id	int	NO	PRI	NULL	auto_increment
customer_id	int	YES	UNI	NULL	

Feedback (feedback)

Field	Type	Null	Key	Default	Extra
feedback_id	int	NO	PRI	NULL	auto_increment
comment	varchar(255)	YES		NULL	
feedback_time	datetime(6)	YES		NULL	
rating	int	YES		NULL	
customer_id	int	YES	MUL	NULL	
vendor_id	int	YES	MUL	NULL	

Payments (payment)

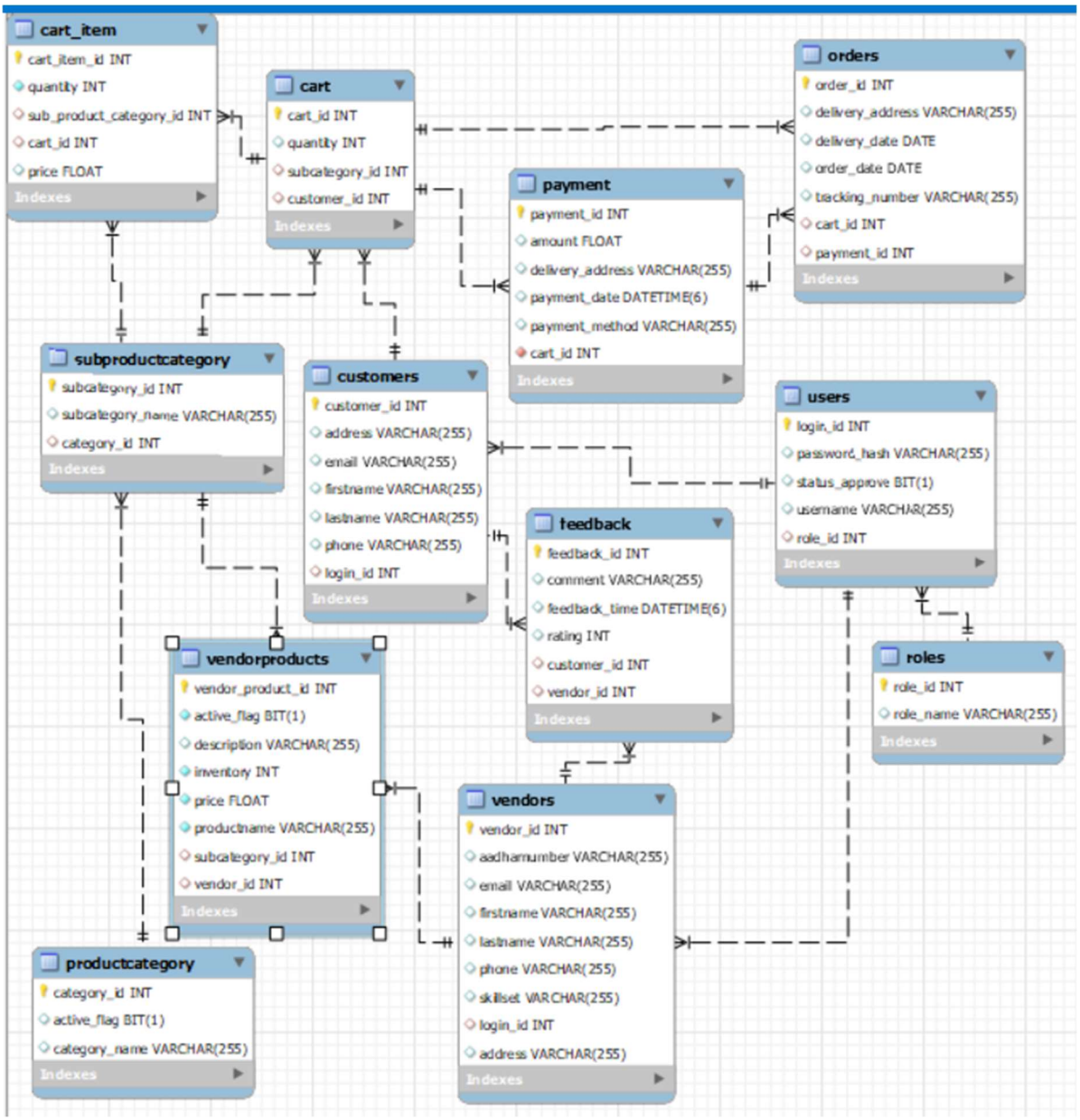
Field	Type	Null	Key	Default	Extra
payment_id	int	NO	PRI	NULL	auto_increment
amount	float	YES		NULL	
delivery_address	varchar(255)	YES		NULL	
payment_date	datetime(6)	YES		NULL	
payment_method	varchar(255)	YES		NULL	
cart_id	int	NO	MUL	NULL	

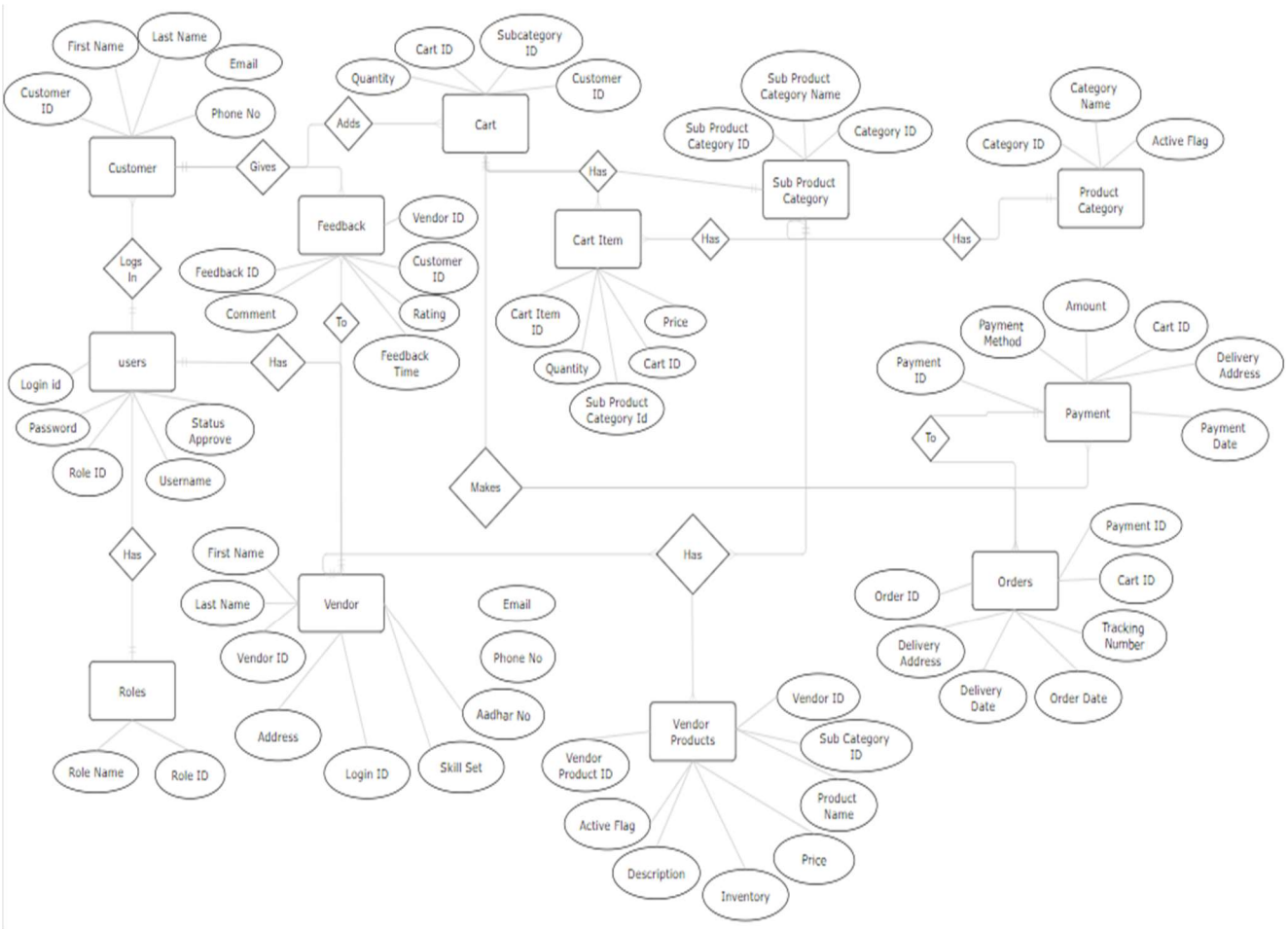
Orders (orders)

Field	Type	Null	Key	Default	Extra
order_id	int	NO	PRI	NULL	auto_increment
delivery_address	varchar(255)	YES		NULL	
delivery_date	date	YES		NULL	
order_date	date	YES		NULL	
tracking_number	varchar(255)	YES		NULL	
cart_id	int	YES	MUL	NULL	
payment_id	int	YES	UNI	NULL	

4. APPENDIX A

Entity Relationship Diagram:




First Name
Last Name
Email
Customer ID
Phone No
Customer
Gives
Adds
Cart ID
Subcategory ID
Quantity
Customer ID
Cart
Sub Product Category Name
Sub Product Category ID
Category ID
Sub Product Category
Has
Category Name
Category ID
Active Flag
Product Category
Has
Feedback
Vendor ID
Customer ID
Rating
Feedback Time
Feedback ID
Comment
To
Logs In
users
Has
Login id
Password
Role ID
Status Approve
Username
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Has
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Amount
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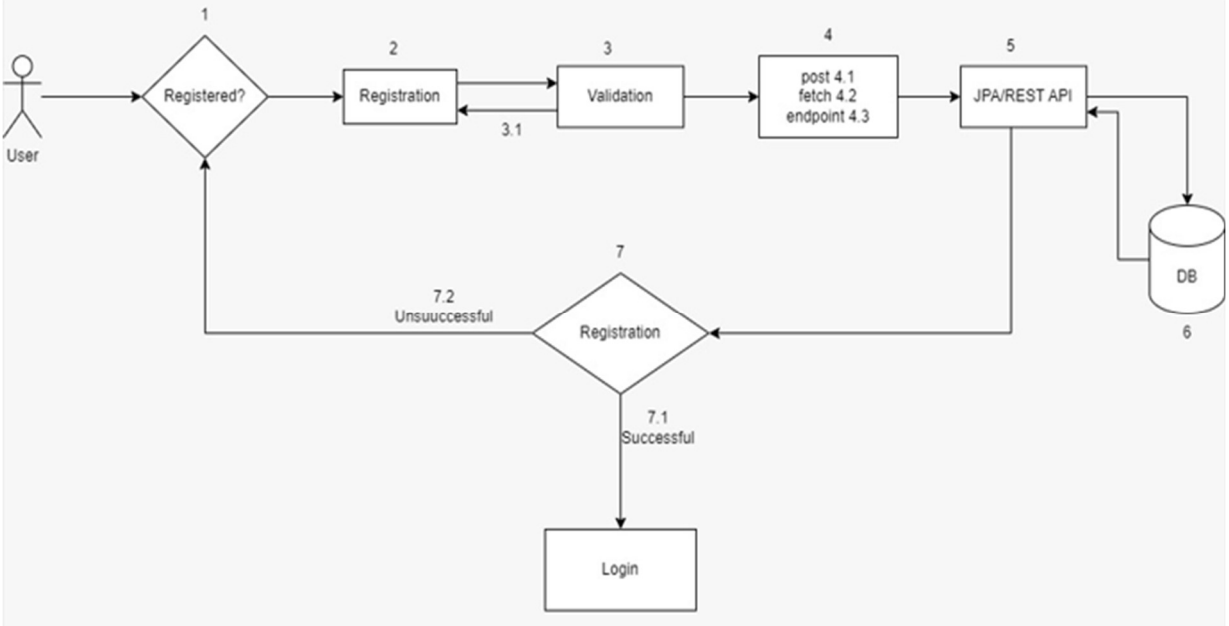
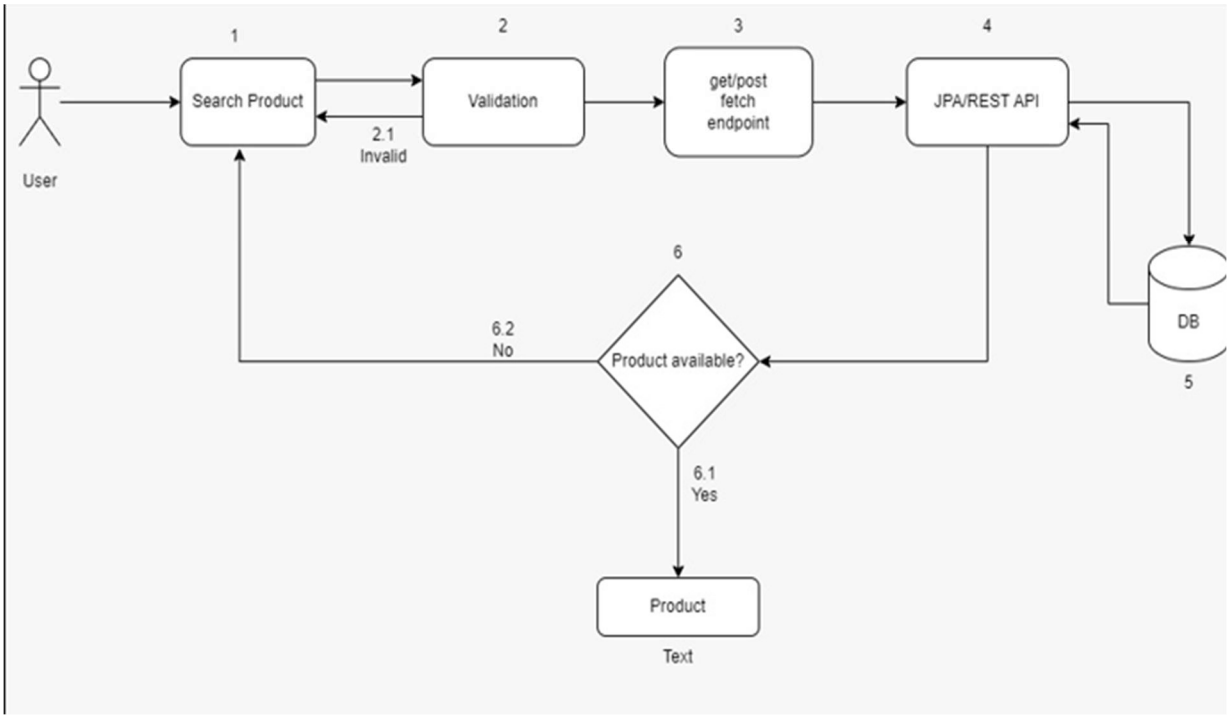
Phone No
Aadhar No
Address
Login ID
Skill Set
Roles
Role Name
Role ID
Has
Vendor Products
Vendor ID
Sub Category ID
Vendor Product ID
Active Flag
Product Name
Price
Description
Inventory
Payment ID
Orders
Cart ID
Order ID
Tracking Number
Delivery Address
Delivery Date
Order Date

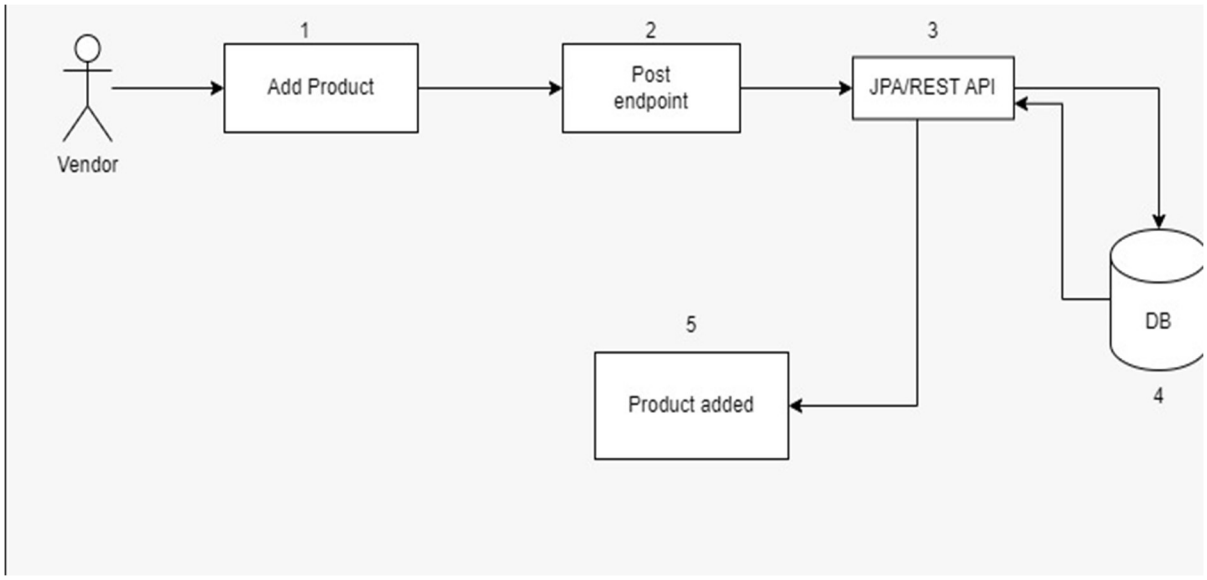
Data Flow Diagram:

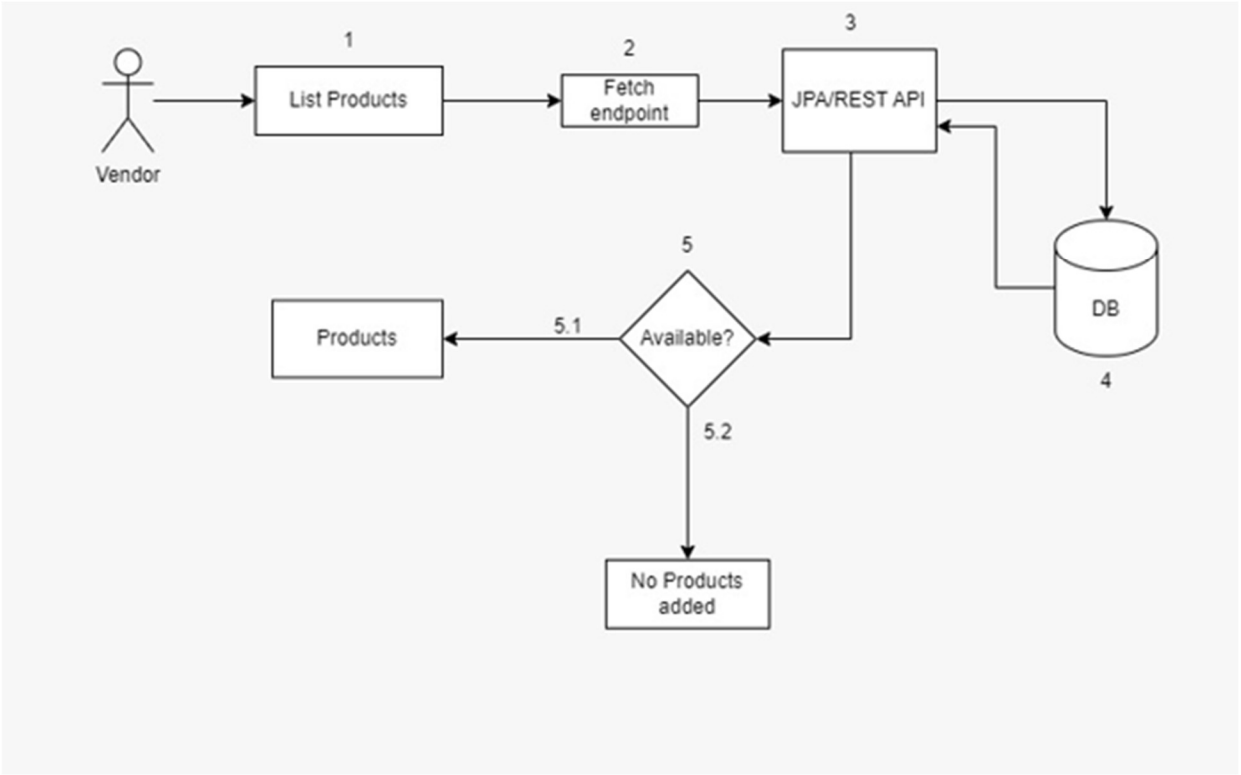
1. Customer Data Flow Diagram:



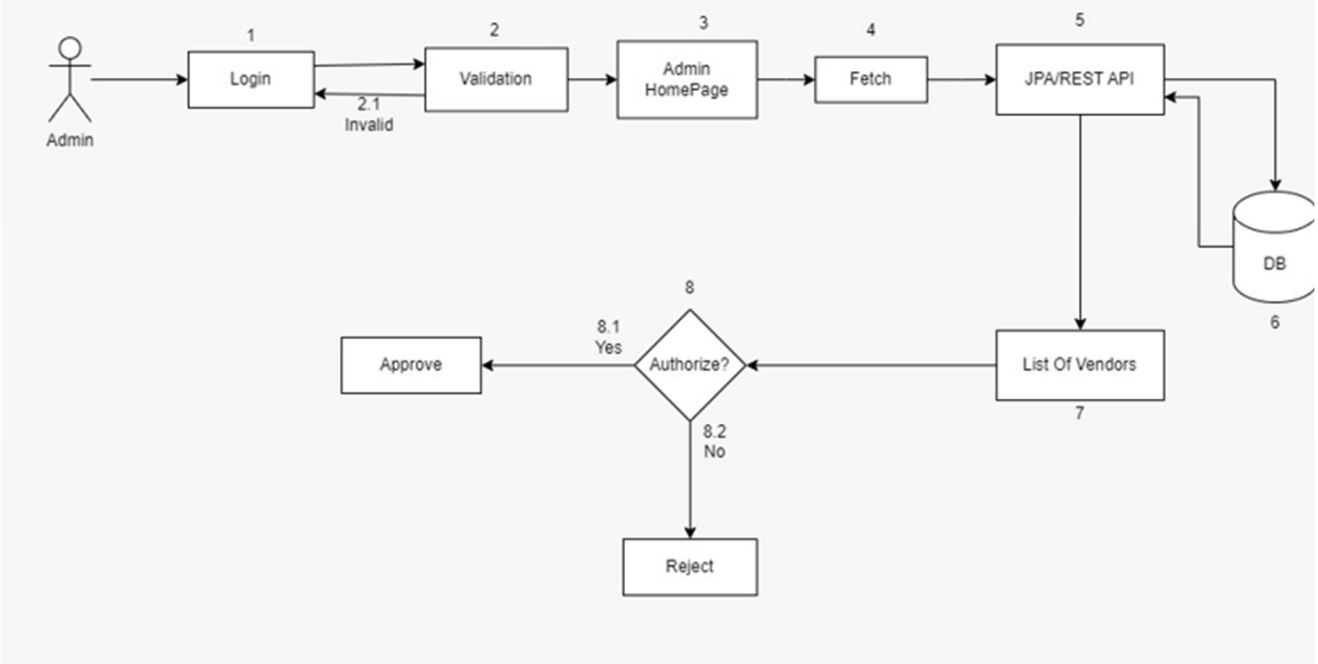


2. Vendor Data Flow Diagram:

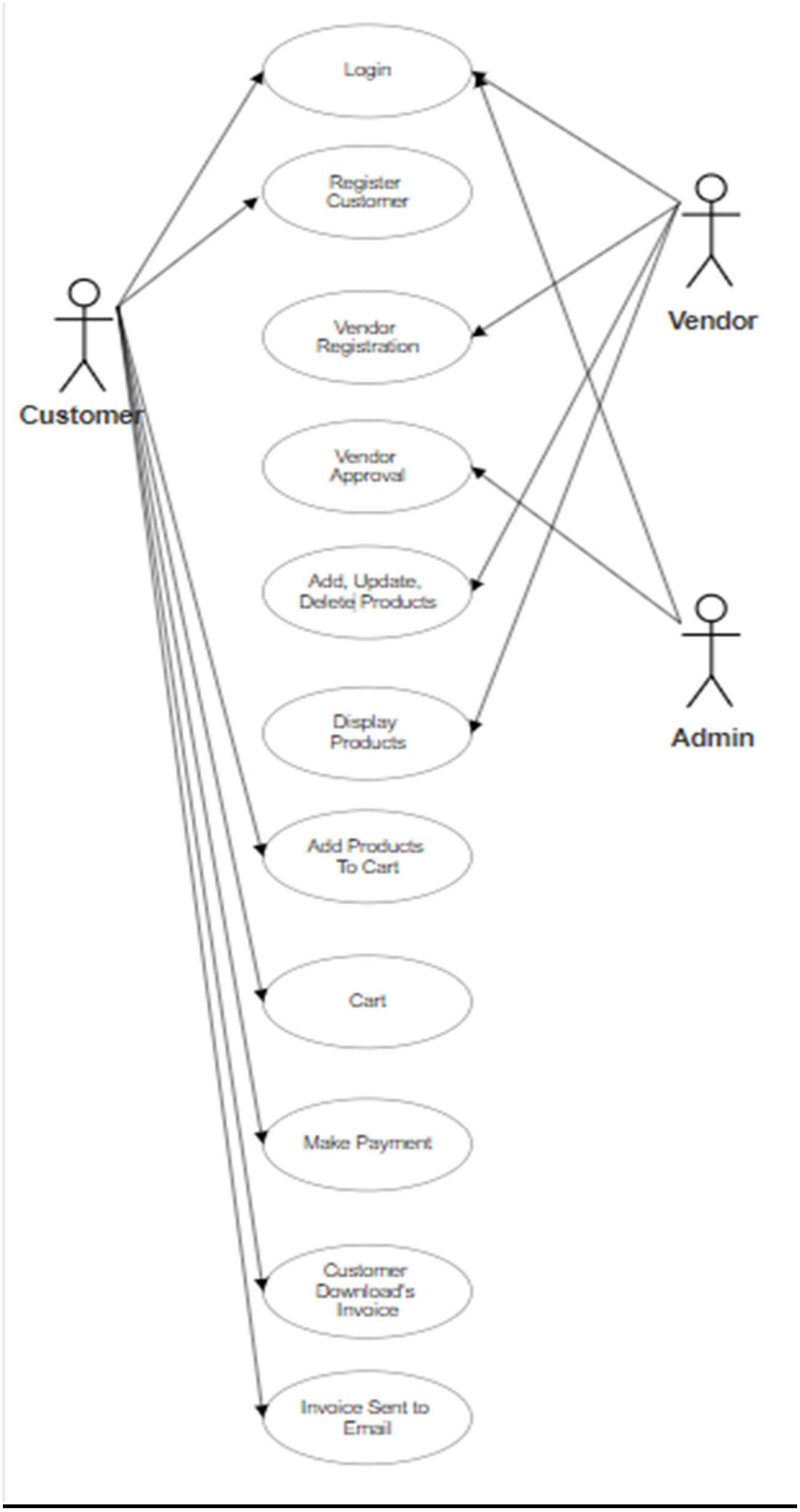




3. Admin Data Flow Diagram:

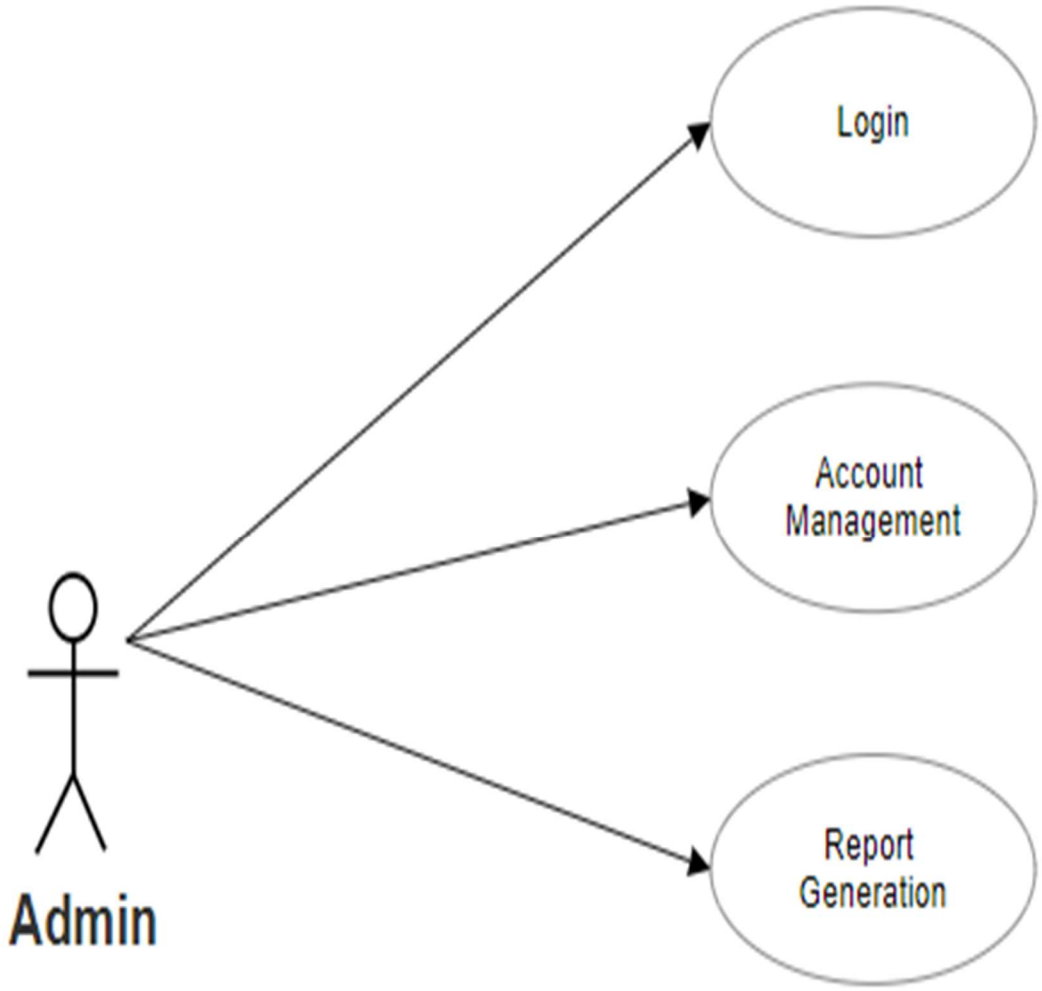


Use Case Diagram:

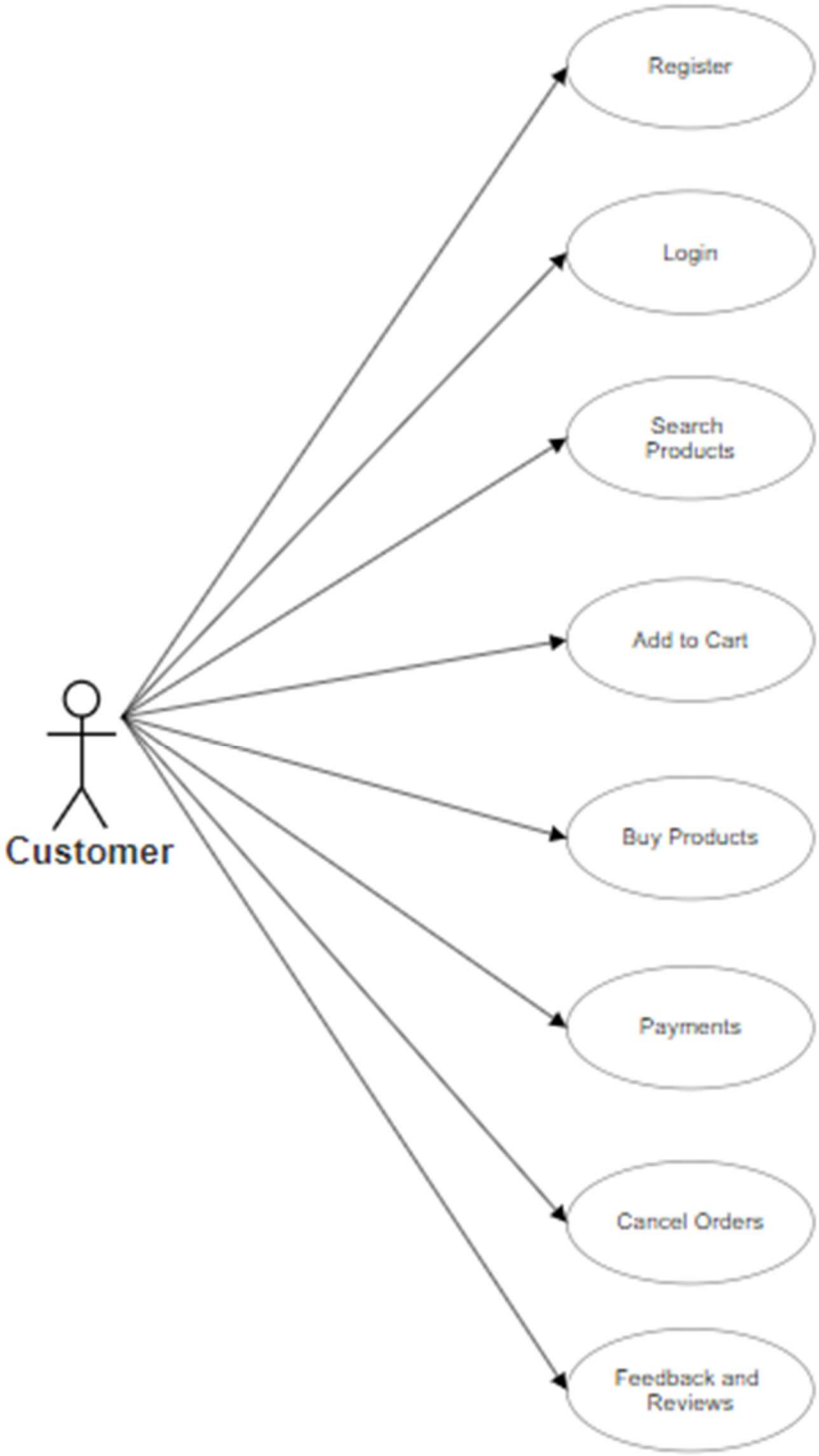


Activity Diagram

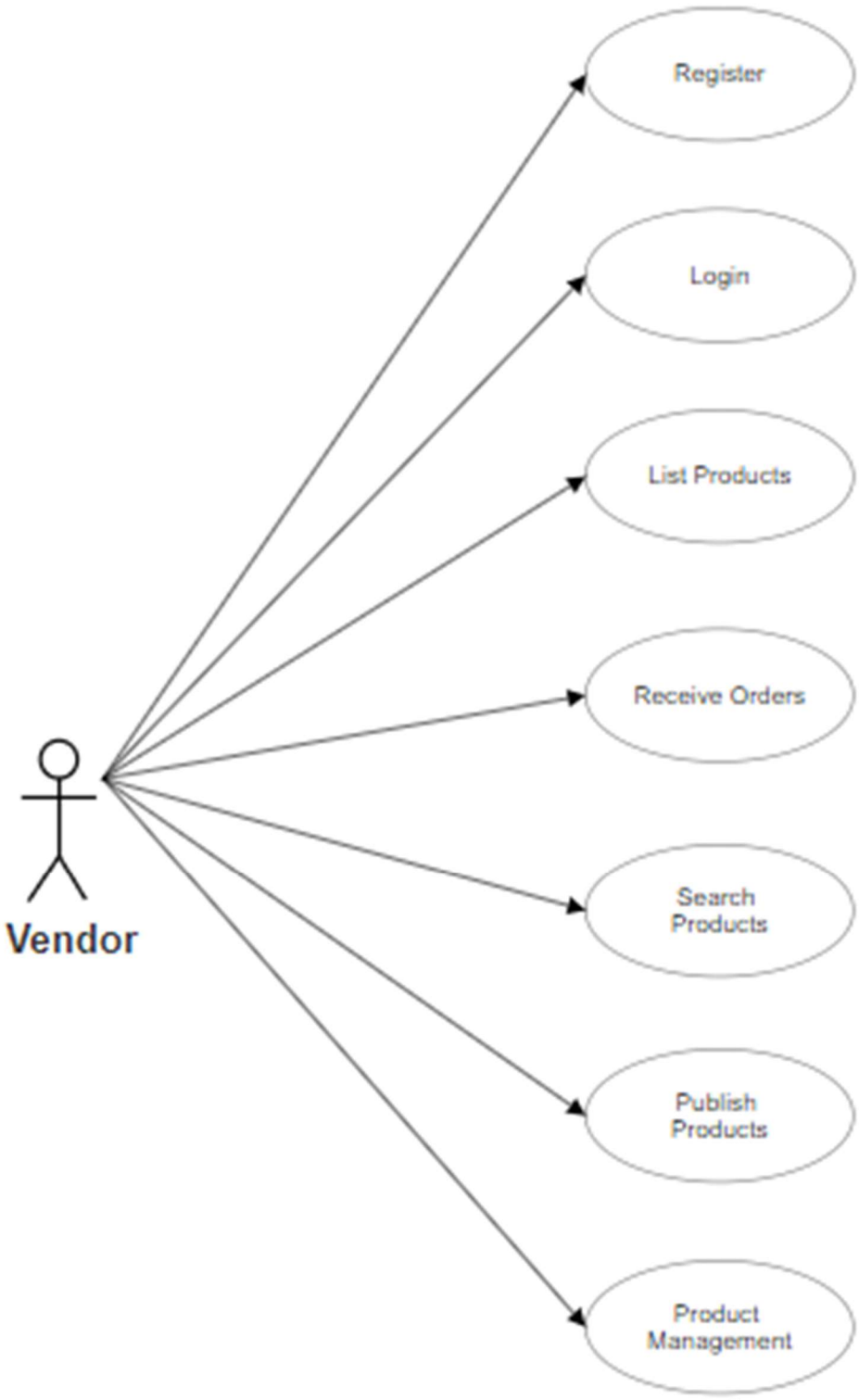
Admin Activity Diagram:



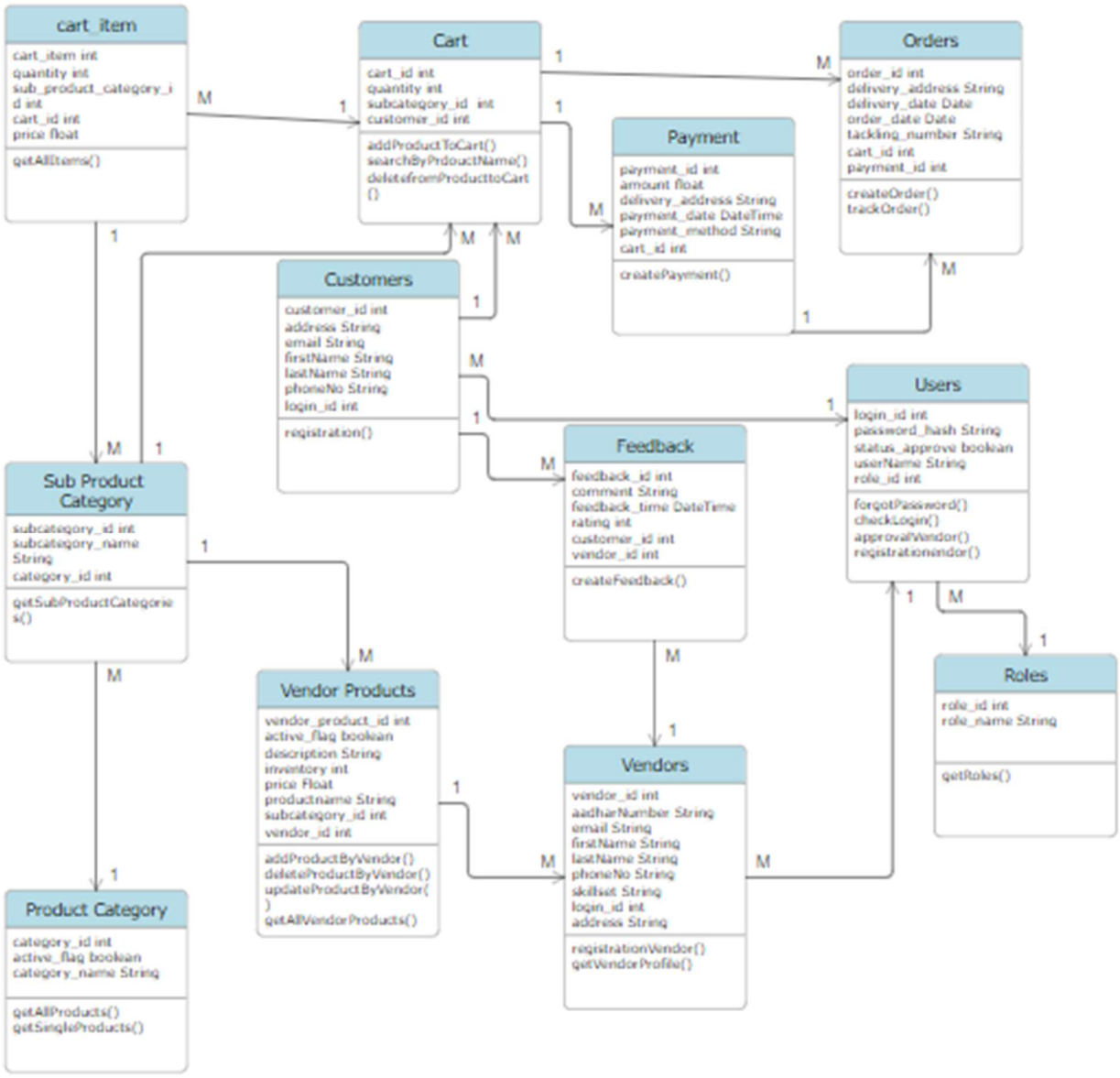
Customer Activity Diagram:



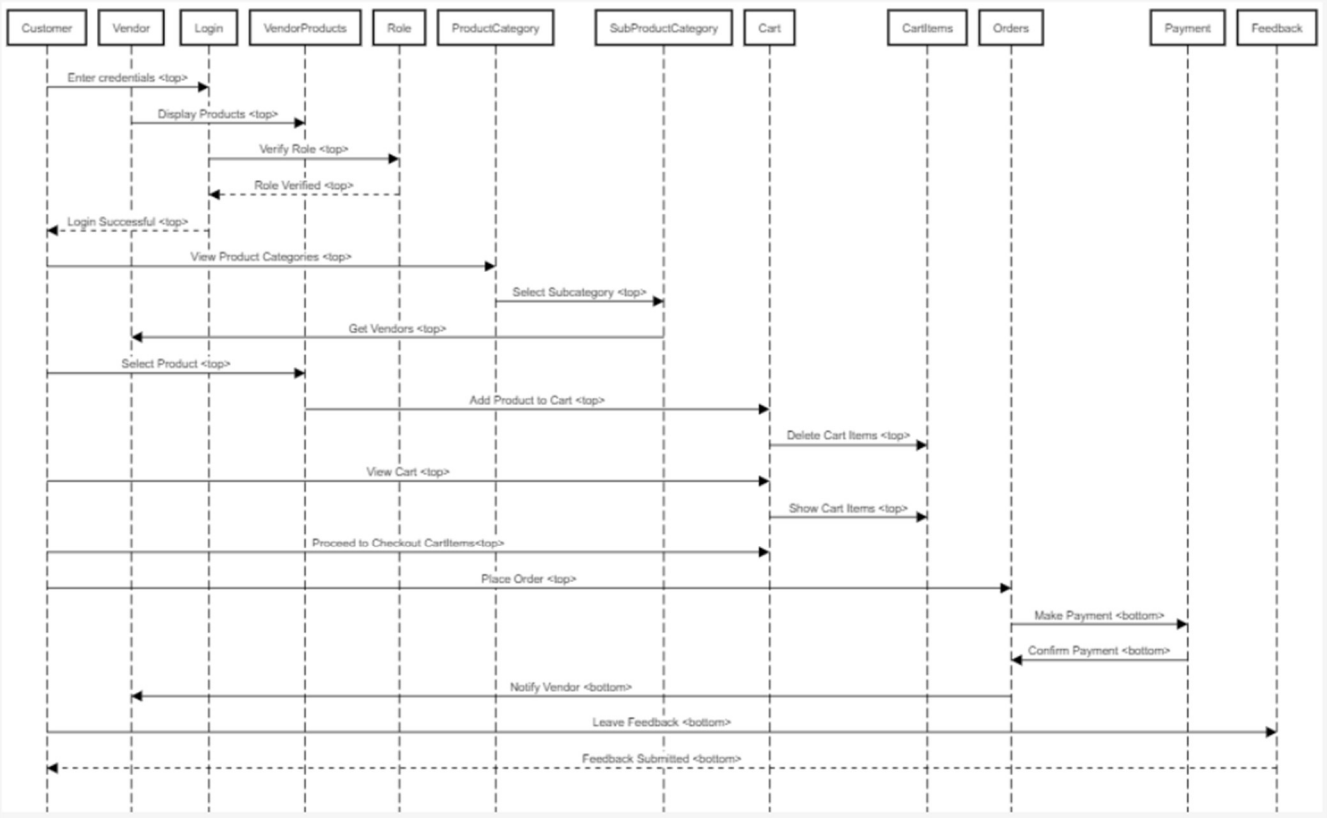
Vendor Activity Diagram:



Class Diagram:

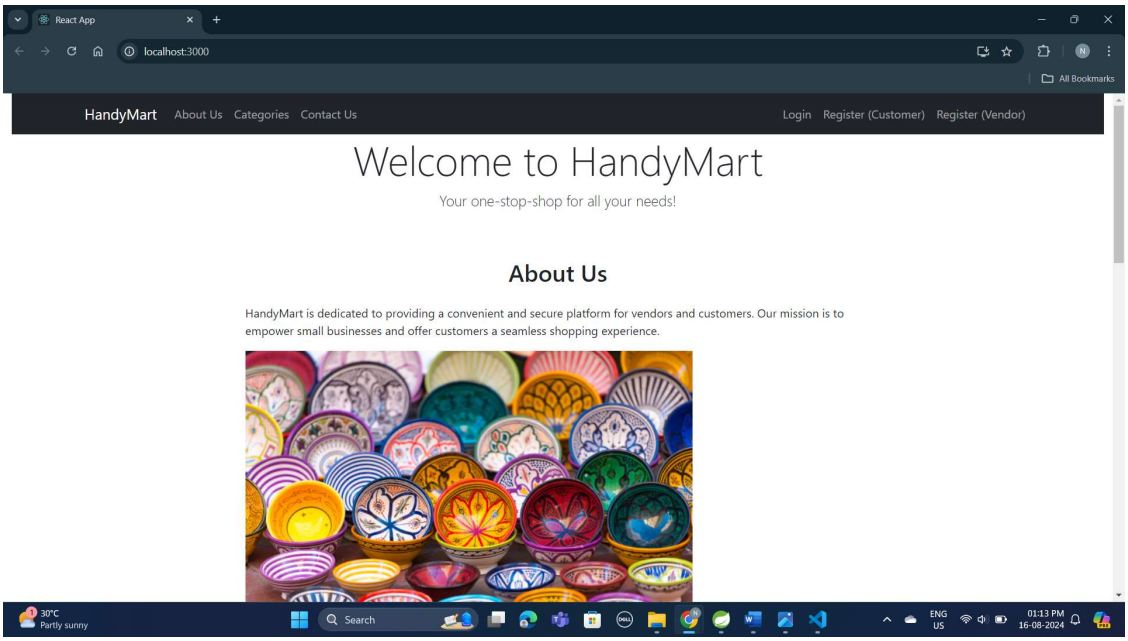


Sequence Diagram:

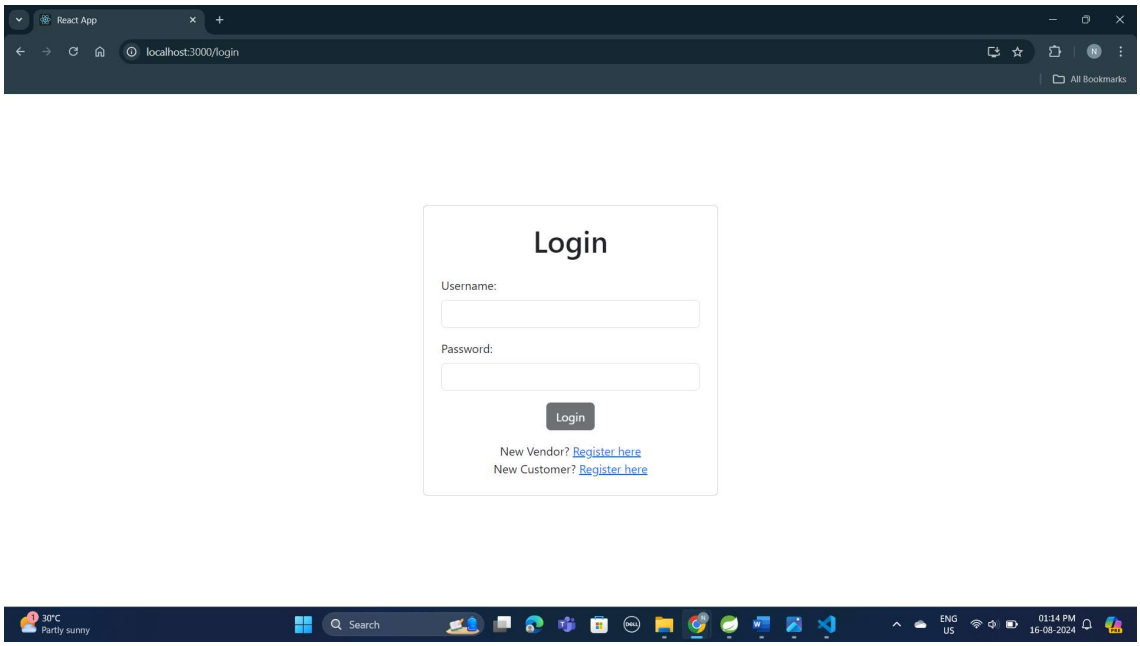


5. Snapshots

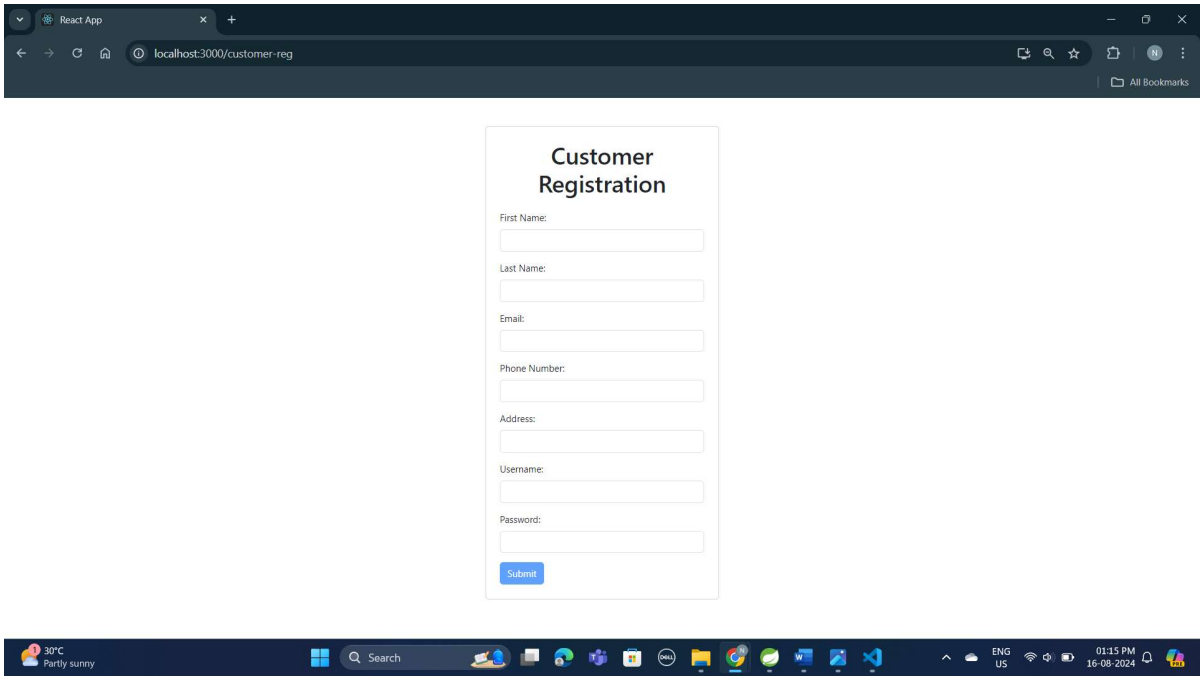
Homepage:



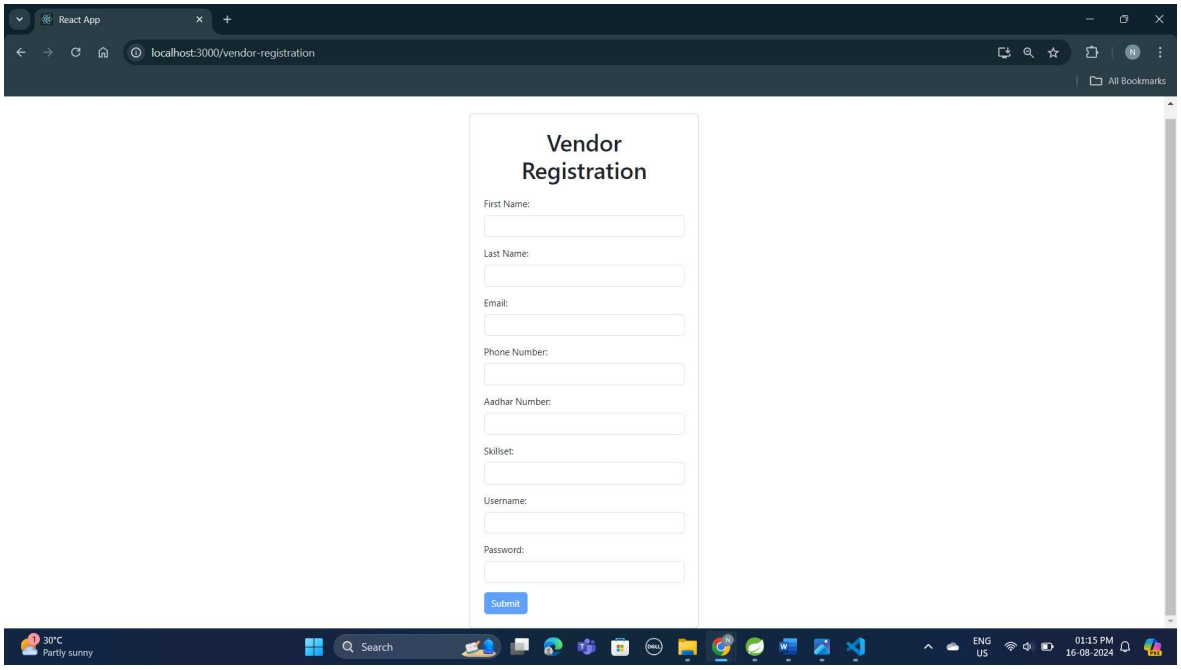
Login:



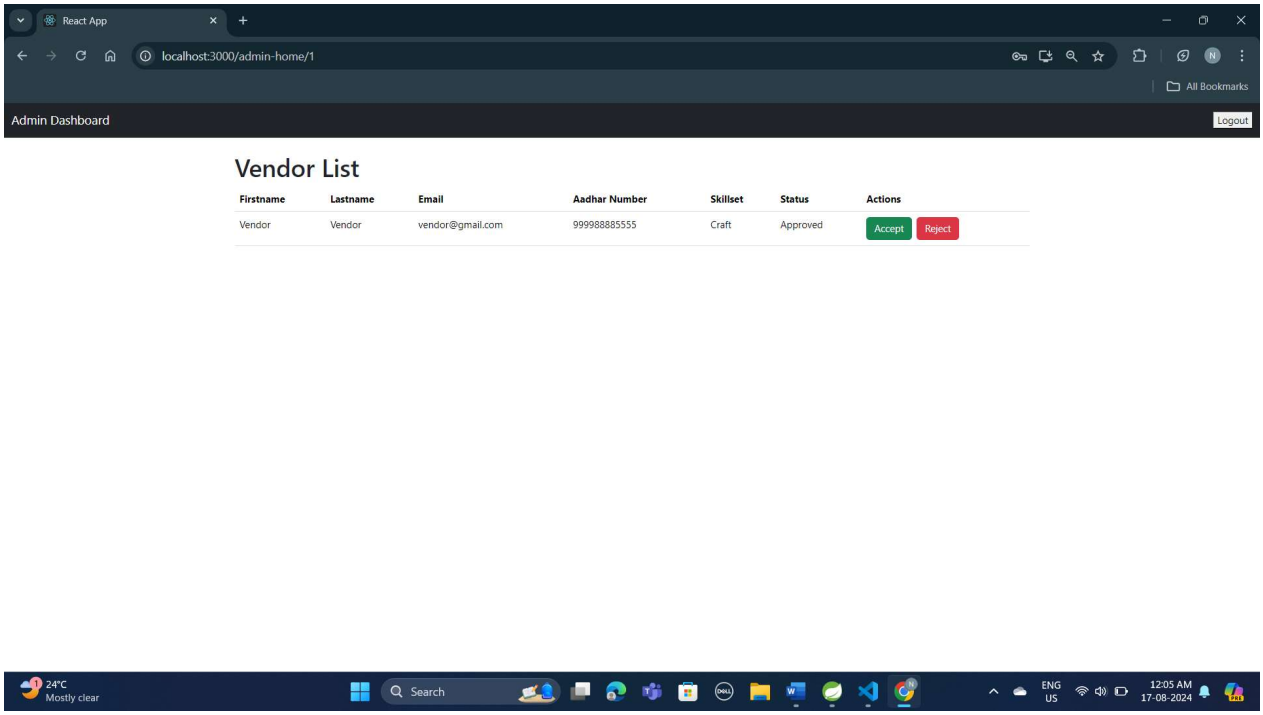
Customer Registration:



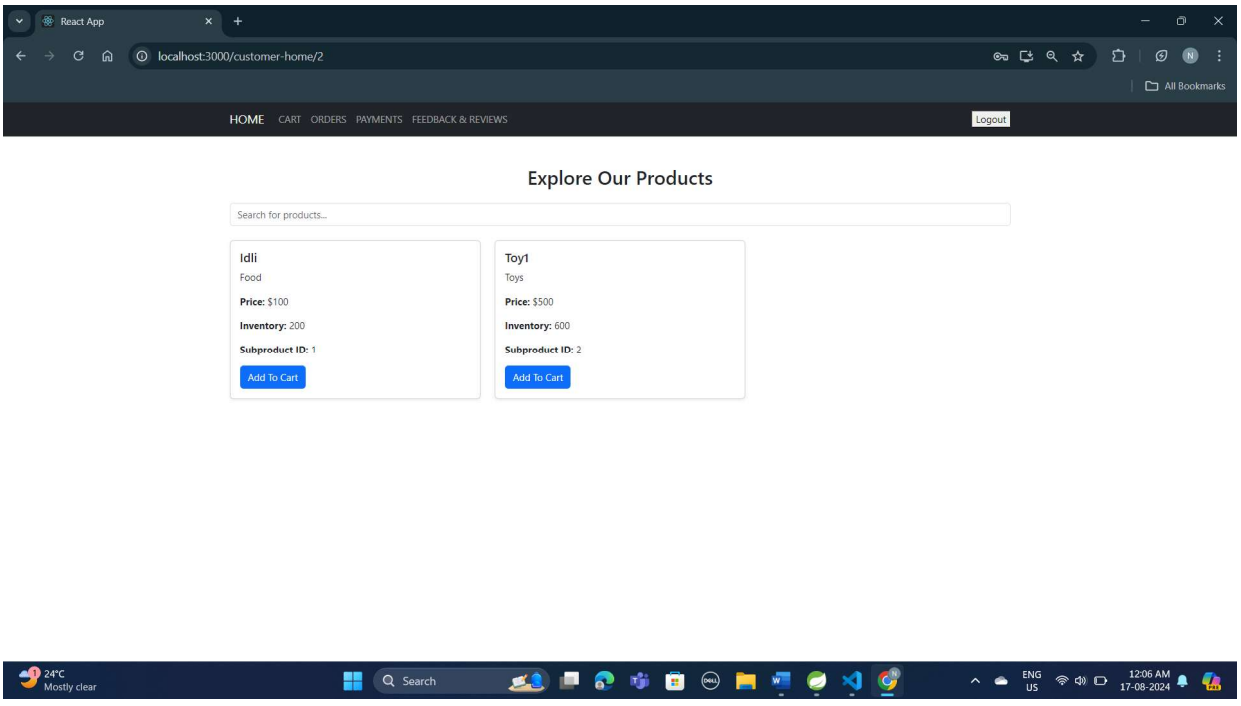
Vendor Registration:



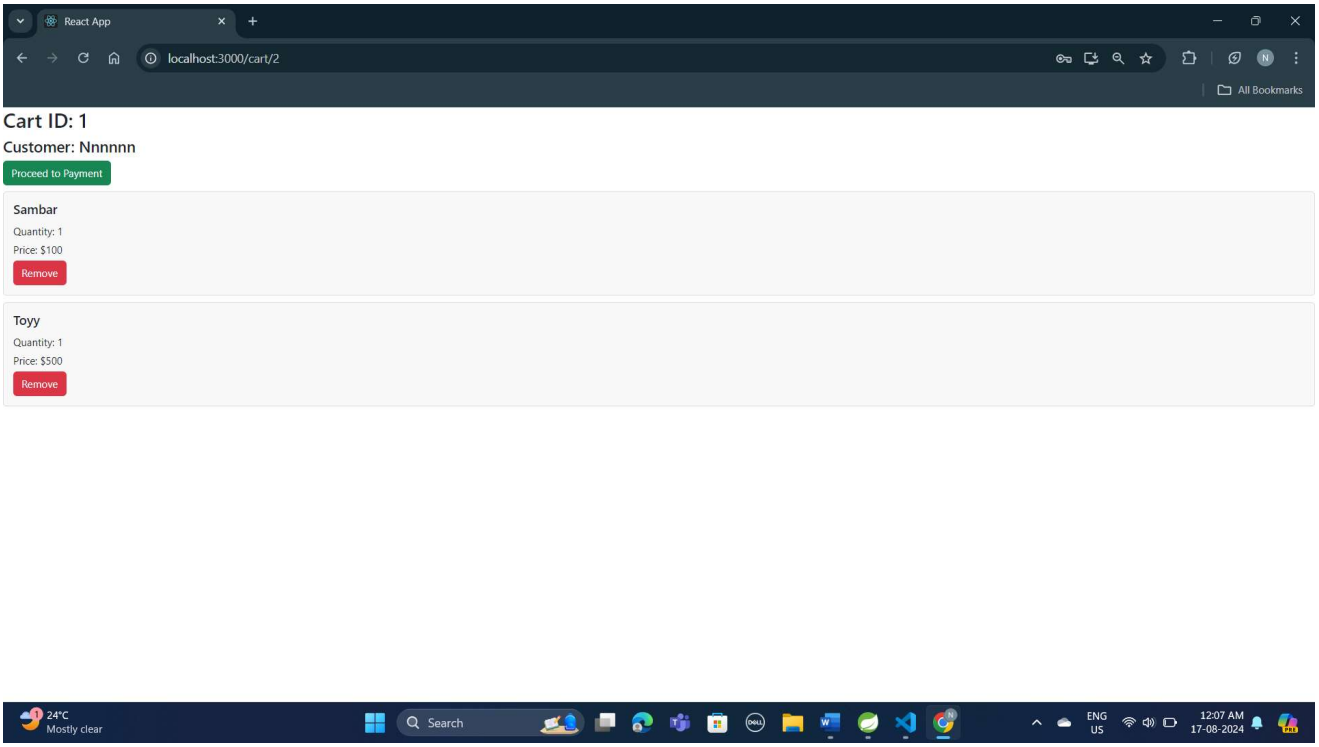
Admin Login:



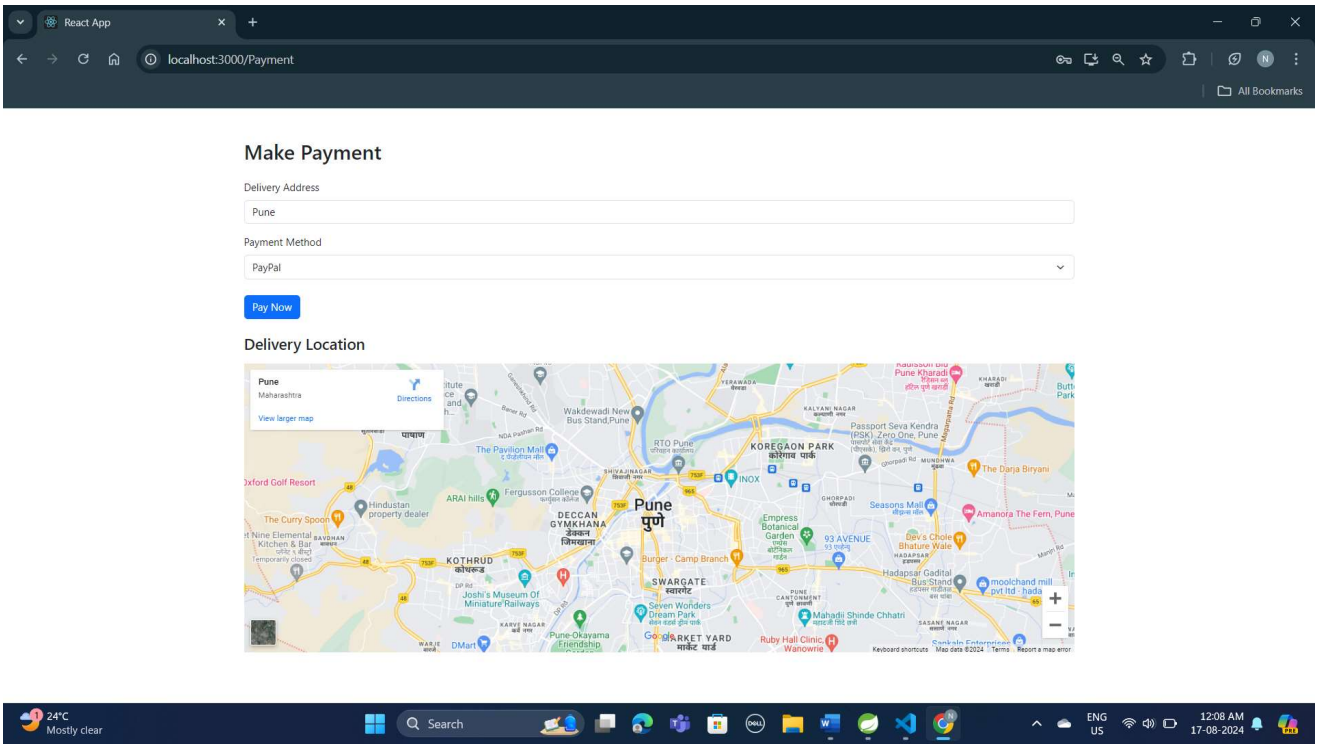
Customer Login:



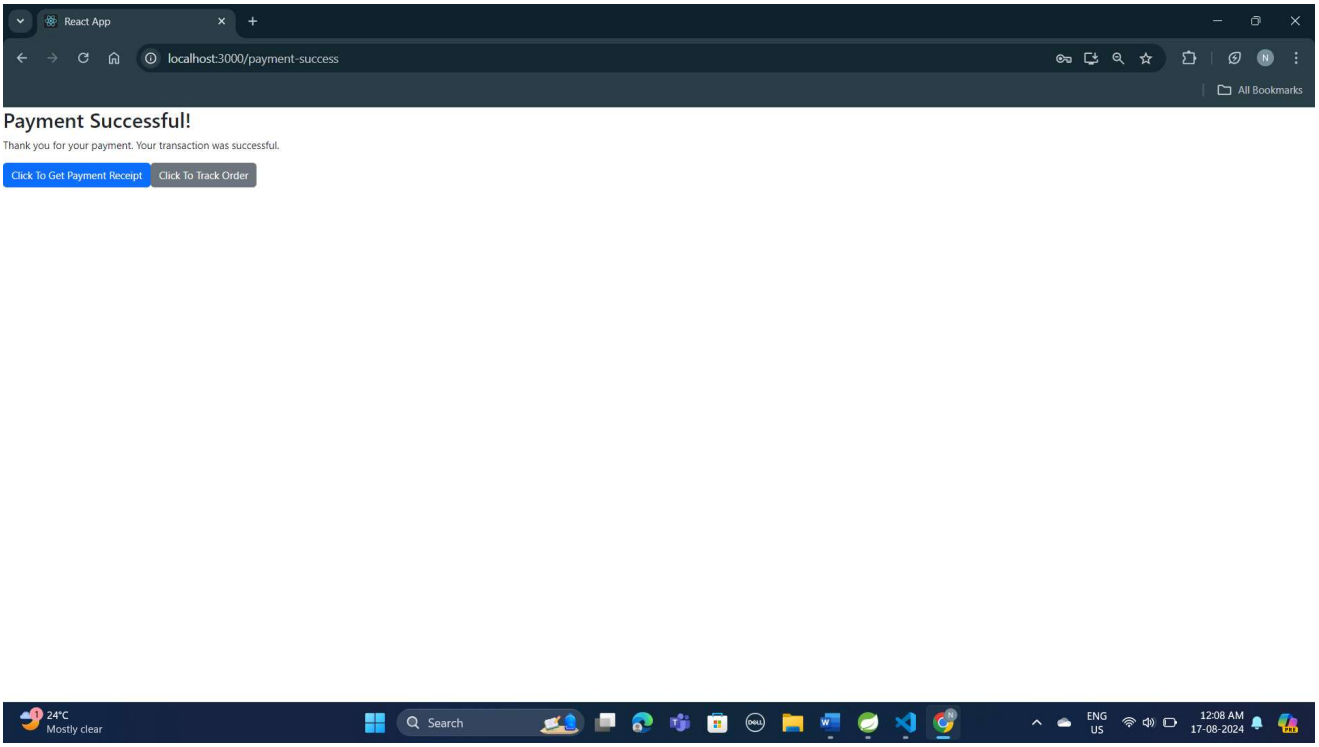
Customer Cart:



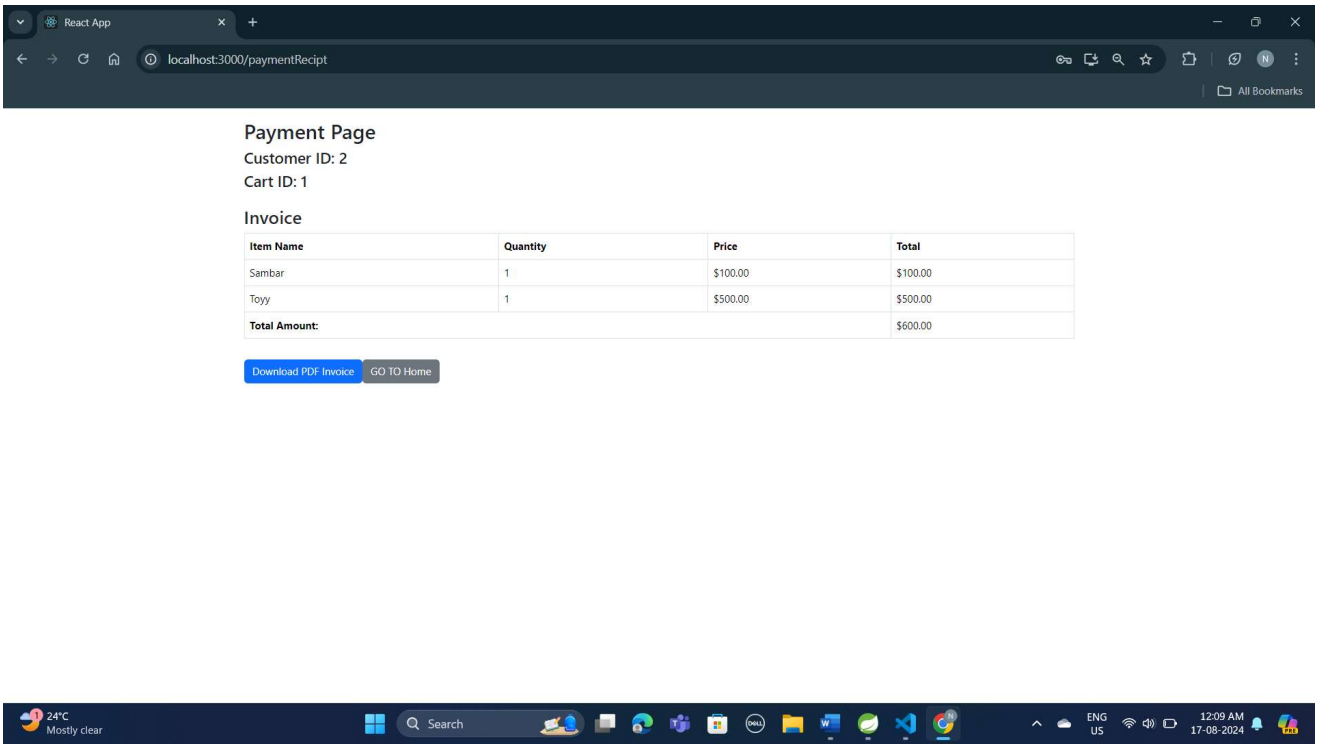
Customer Payment with Location:



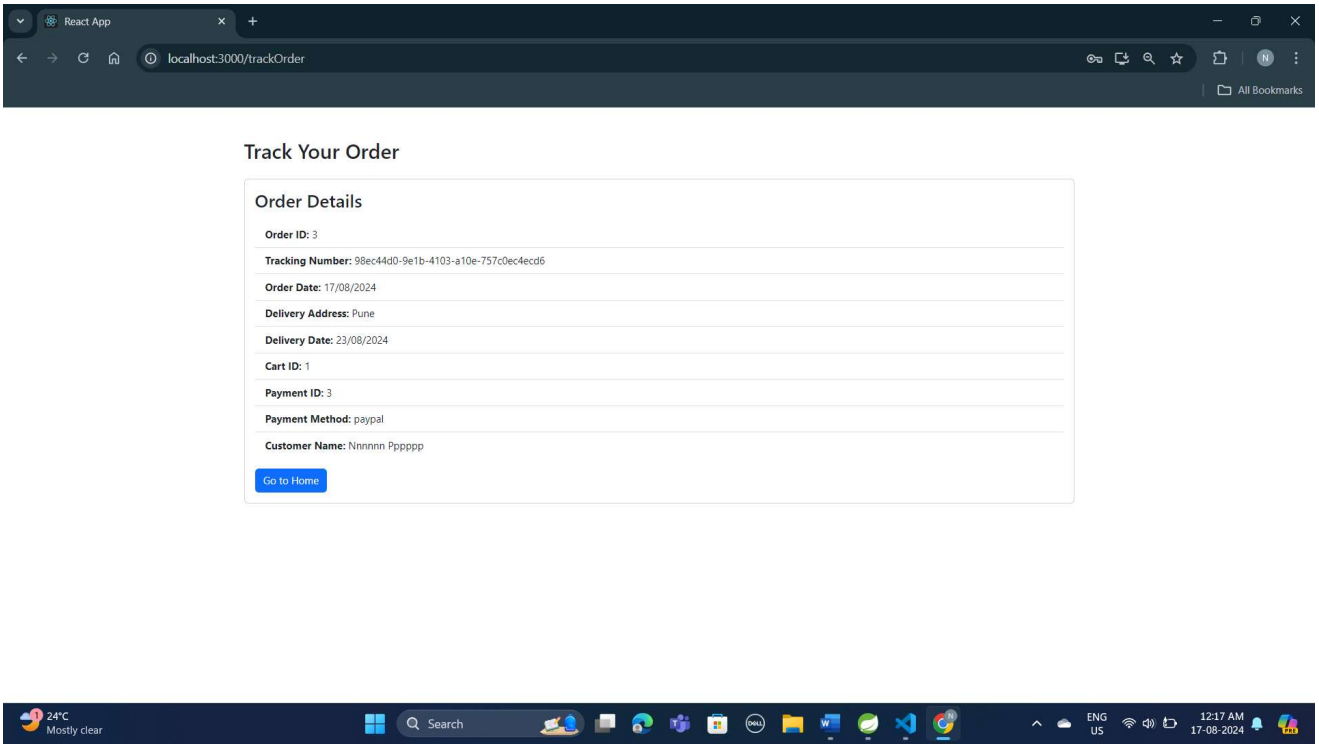
Customer Payment Success:



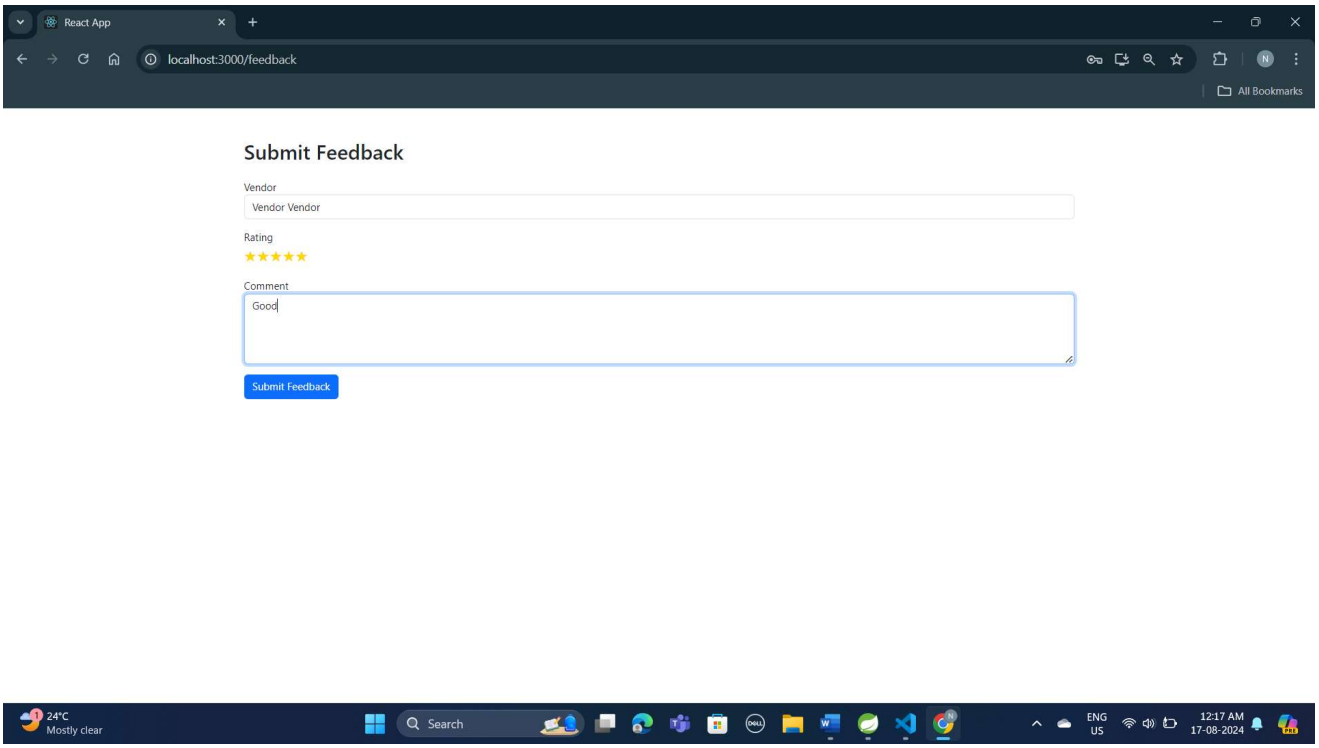
Customer Payment Details:



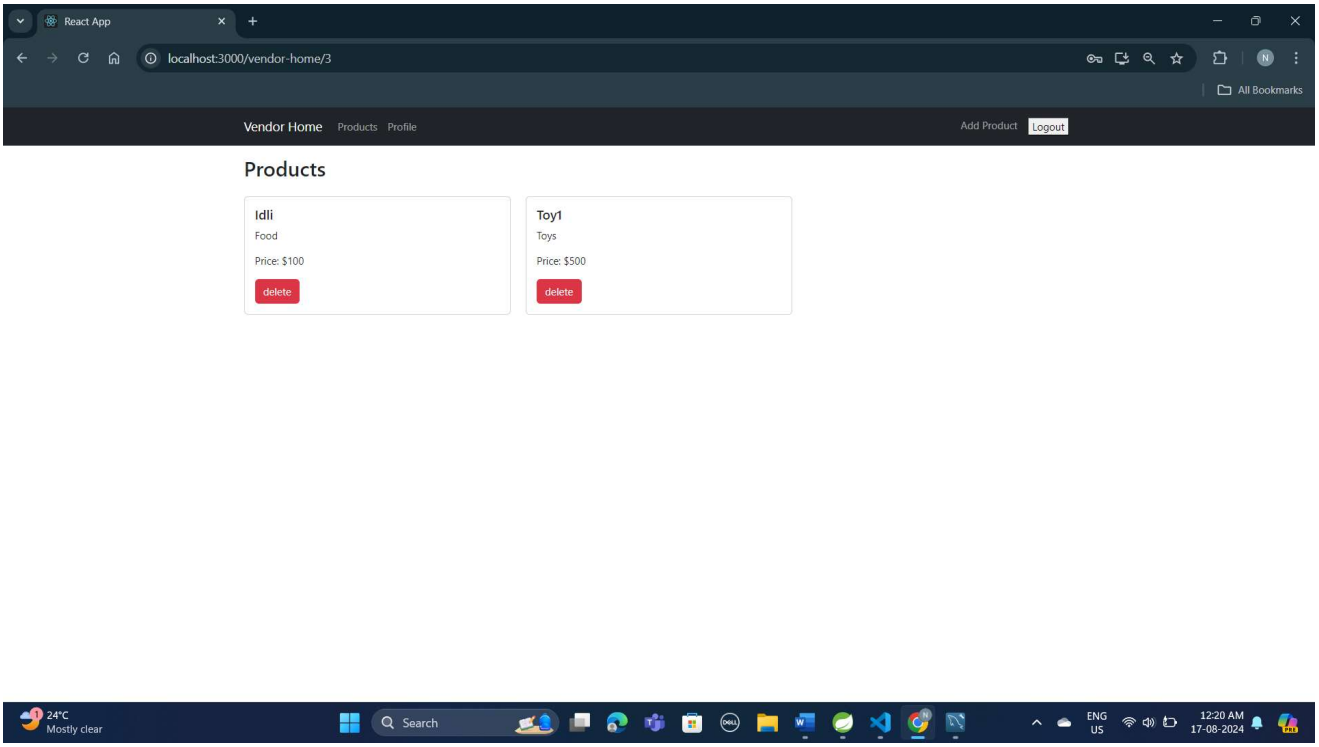
Customer Track Order:



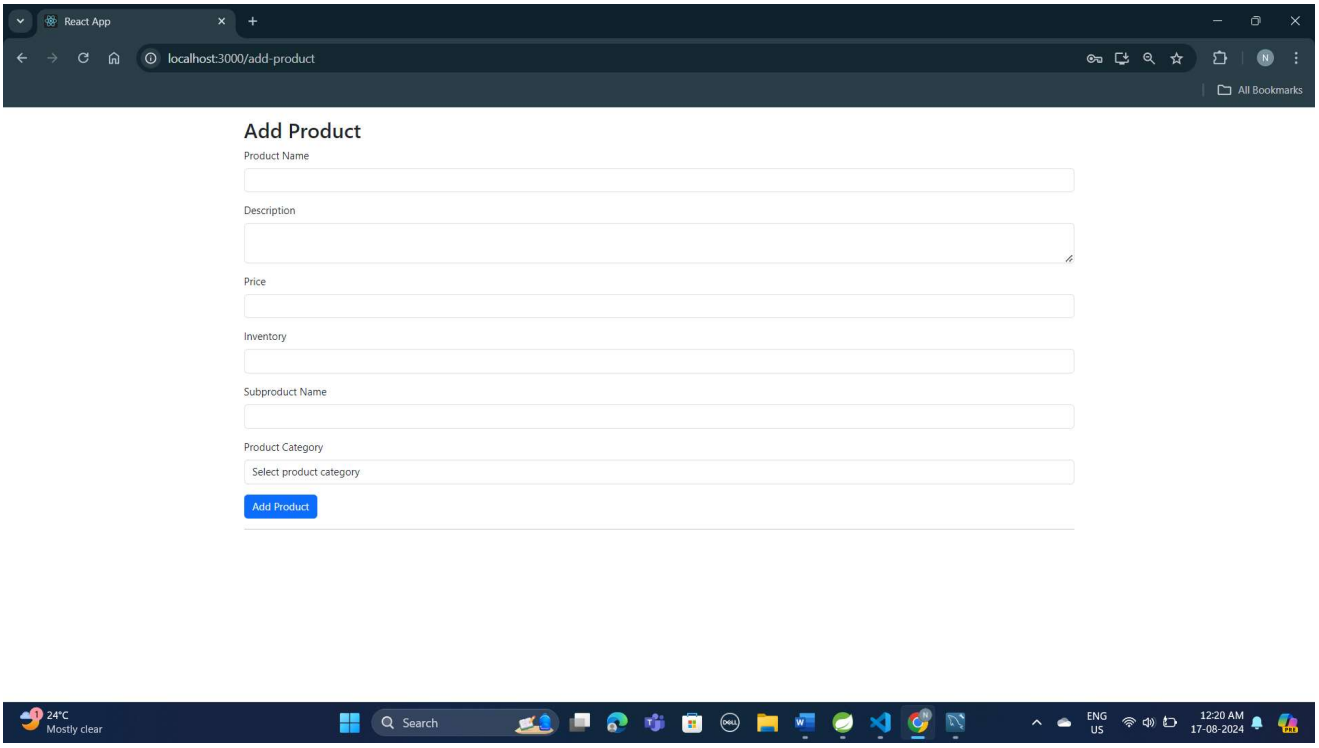
Customer Feedback and Review:



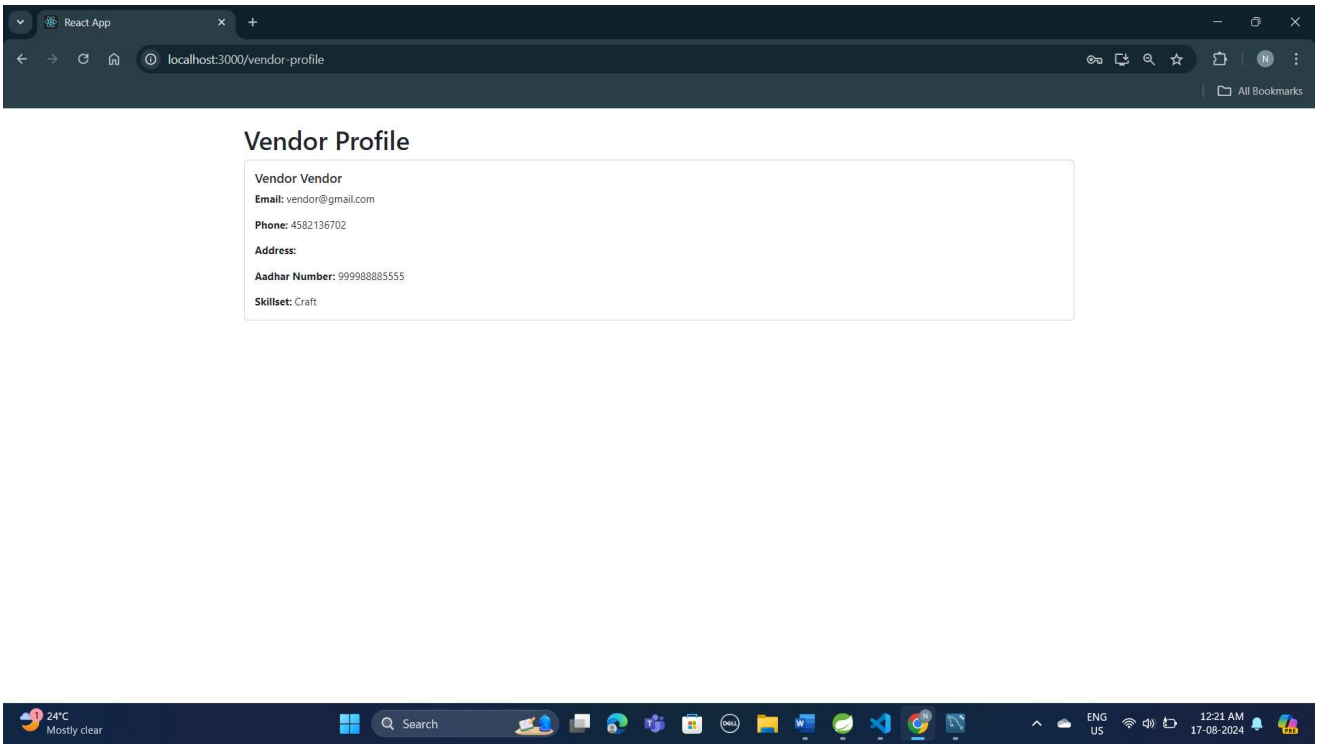
Vendor Login:



Vendor Add Product:



Vendor Profile:



6. REFERENCES

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7. CONCLUSION

The The Handy-Mart E-Commerce Web Application Project has been a strategic initiative designed to create a robust, scalable, and user-centric online marketplace. Throughout the development process, the project has focused on delivering a seamless shopping experience for customers while providing merchants with powerful tools to manage their online presence effectively. The platform successfully integrates key functionalities such as secure user authentication, comprehensive product catalogue management, efficient shopping cart and checkout processes, and advanced order and inventory management. These features, coupled with a strong emphasis on security and compliance, position Handy-Mart as a trustworthy and efficient platform for digital commerce.
Handy-Mart's commitment to excellence is reflected in its modern technology stack, which ensures high performance, responsiveness, and the ability to scale with increasing demand. By adopting best practices in web development, including microservices architecture and cloud deployment, the platform is well-equipped to handle large volumes of transactions while maintaining reliability and speed. Additionally, the focus on user experience—through features like personalized product recommendations, real-time order tracking, and responsive customer support—ensures that Handy-Mart not only meets but exceeds the expectations of its users.

The project also underscores the importance of continuous improvement and adaptability in the fast-paced world of e-commerce. As the digital landscape evolves, Handy-Mart is designed to evolve with it, incorporating new technologies and responding to emerging consumer trends. This adaptability is key to sustaining long-term success in a competitive market.

In conclusion, the Handy-Mart E-Commerce Web Application Project has laid a solid foundation for a thriving online marketplace that is both innovative and customer-focused. It represents a significant achievement in the realm of e-commerce, offering a comprehensive solution that benefits both consumers and merchants. The platform's design and functionality are not only aligned with current market needs but are also poised to adapt to future challenges and opportunities. Handy-Mart is well-positioned to become a leading player in the e-commerce industry, offering a reliable, secure, and enjoyable shopping experience for all its users.