AWS CLOUD PRACTIONER – SDC091

FRESHBASKET: SCALABLE E-COMMERCE PLATFORM USING FLASK ON AWS EC2 AND RDS

PROJECT REPORT

Submitted by

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INTRODUCTION:

The "FreshBasket" project showcases the creation and deployment of a scalable e-commerce platform specifically designed for selling vegetables and fruits. The platform employs Flask as the backend framework, ensuring efficient management of business logic and user interactions. This lightweight framework allows for rapid development and seamless integration of key features essential for an e-commerce application. By prioritizing performance and reliability, the project addresses the unique challenges of managing perishable goods in an online retail environment.

To achieve scalability and high availability, FreshBasket leverages AWS EC2 for hosting the application and Amazon RDS for robust database management. EC2 provides the computational power required to handle fluctuating user traffic, while RDS ensures secure, efficient storage and retrieval of critical data like product catalogs and user information. This combination of technologies establishes a cloud-native architecture capable of supporting the growing demands of an e-commerce platform.

FreshBasket highlights the potential of cloud-native solutions in the e-commerce sector by enabling seamless user interactions, dynamic catalog management, and efficient order processing. Through its modular design and scalable infrastructure, the project not only demonstrates technical excellence but also provides a practical framework for deploying similar online retail solutions in a variety of scenarios.

OBJECTIVES:

The primary objectives of this project are as follows:

- To develop a scalable and responsive e-commerce platform for fresh produce, capable of handling varying levels of user traffic efficiently.
- To utilize Flask as the backend framework for managing user sessions and implementing business logic, ensuring a lightweight and fast-performing application.
- To deploy the application on AWS EC2, providing a robust infrastructure that supports scalability and ensures high availability for uninterrupted user experience.

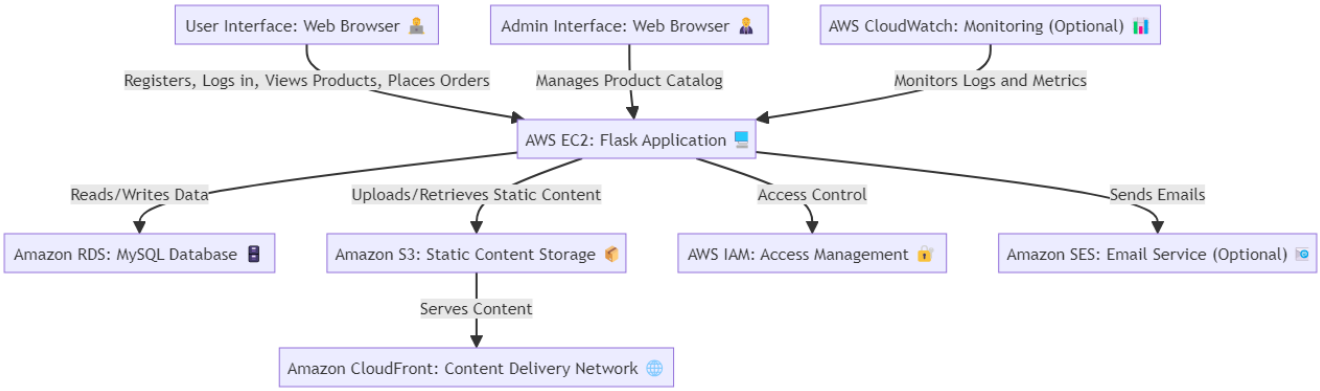
- To use Amazon RDS for database management, ensuring efficient, secure, and reliable storage and retrieval of critical data like product catalogs and user information.

- To demonstrate the benefits of a cloud-native architecture, showcasing its ability to handle dynamic traffic patterns and operational demands seamlessly.

TECHNOLOGIES USED:

1. **Flask**: Flask is a lightweight and flexible backend web framework that simplifies the development of web applications. It is particularly suited for managing user sessions, handling business logic, and processing requests related to catalog data and orders. Its modular structure allows developers to add extensions as needed, making it a versatile choice for scalable applications like FreshBasket.
2. **AWS EC2**: Amazon Elastic Compute Cloud (EC2) provides scalable virtual servers in the cloud, enabling businesses to adjust computing resources based on traffic demands. For FreshBasket, EC2 ensures reliable hosting with the ability to scale up or down during peak usage periods, such as holiday sales or promotional events.
3. **Amazon RDS**: Amazon Relational Database Service (RDS) is a managed database solution that automates administrative tasks like backups, scaling, and patching. By utilizing RDS, FreshBasket can efficiently store and retrieve user and product data while maintaining high levels of reliability and performance.
4. **MySQL Workbench**: MySQL Workbench is a comprehensive database management tool used for designing, querying, and managing relational databases. It provides an intuitive interface for creating database schemas, executing SQL queries, and optimizing database performance, which is crucial for handling the data-intensive operations of FreshBasket.

ARCHITECTURE:



MODULES:

The FreshBasket platform is composed of the following modules:

1. **User Authentication**: This module provides secure access by enabling users to register and log in to the platform. It ensures that user credentials are safely stored and validated during each session.
2. **Product Catalog Management**: This module displays the available fruits and vegetables along with their prices and detailed descriptions. It allows users to browse and search for products efficiently.
3. **Shopping Cart**: This feature allows users to add, update, and remove items from their cart. It dynamically calculates the total cost and prepares the items for checkout.
4. **Order Processing**: This module handles the checkout operations, including order confirmation and integration with payment gateways. It ensures a smooth transaction flow for users.
5. **Admin Dashboard**: Designed for administrators, this module helps manage inventory, track orders, and update product details. It ensures that the platform remains up-to-date and operational.

CONCEPTS:

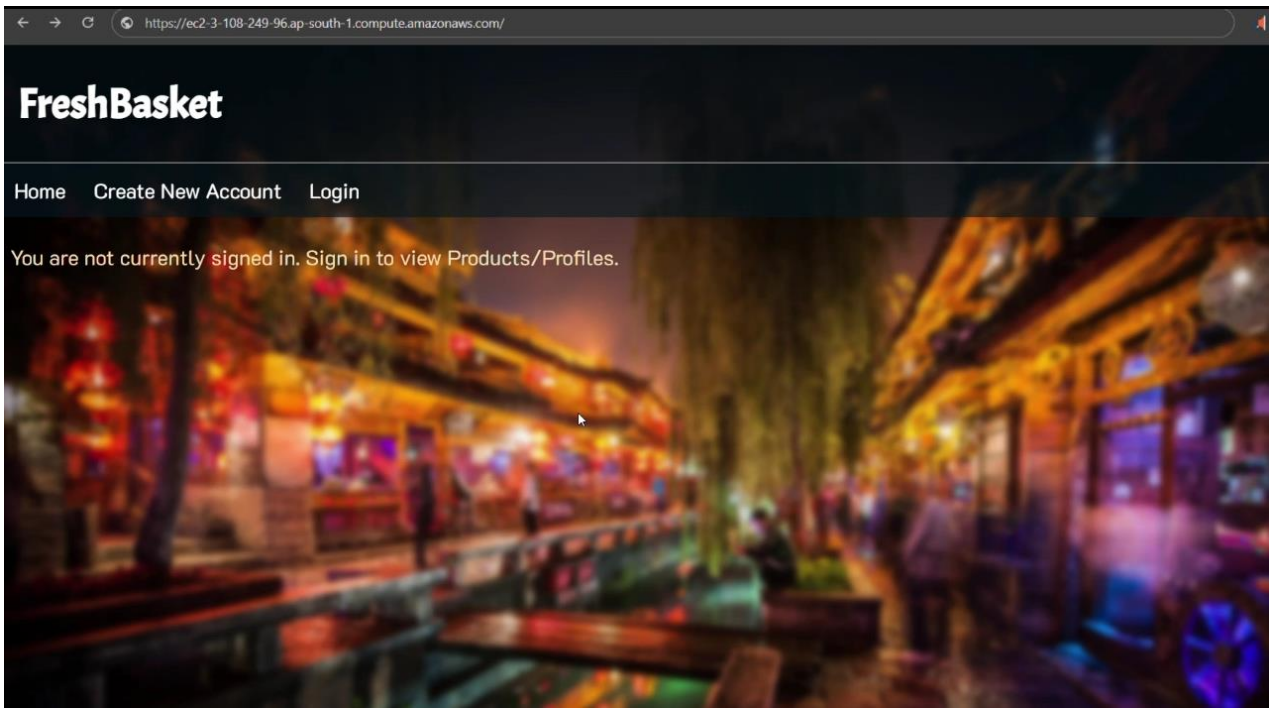
1. **Scalable Web Architecture**: The platform is designed to handle increasing levels of traffic without impacting performance. This ensures that the application remains responsive and reliable, even during peak usage periods.
2. **Cloud-Native Deployment**: By leveraging AWS services like EC2 for hosting and RDS for database management, the platform achieves high reliability and flexibility. This approach enables easy scaling and seamless integration of cloud resources.
3. **Database Integration**: MySQL Workbench is utilized for efficient data management, schema design, and query execution. It ensures that the platform's data storage and retrieval processes are optimized and reliable.
4. **Backend Efficiency**: Flask's lightweight framework ensures fast response times and efficient handling of backend operations. This enhances the user experience by providing a seamless and quick interaction with the platform.

GESTURES IMPLEMENTED:

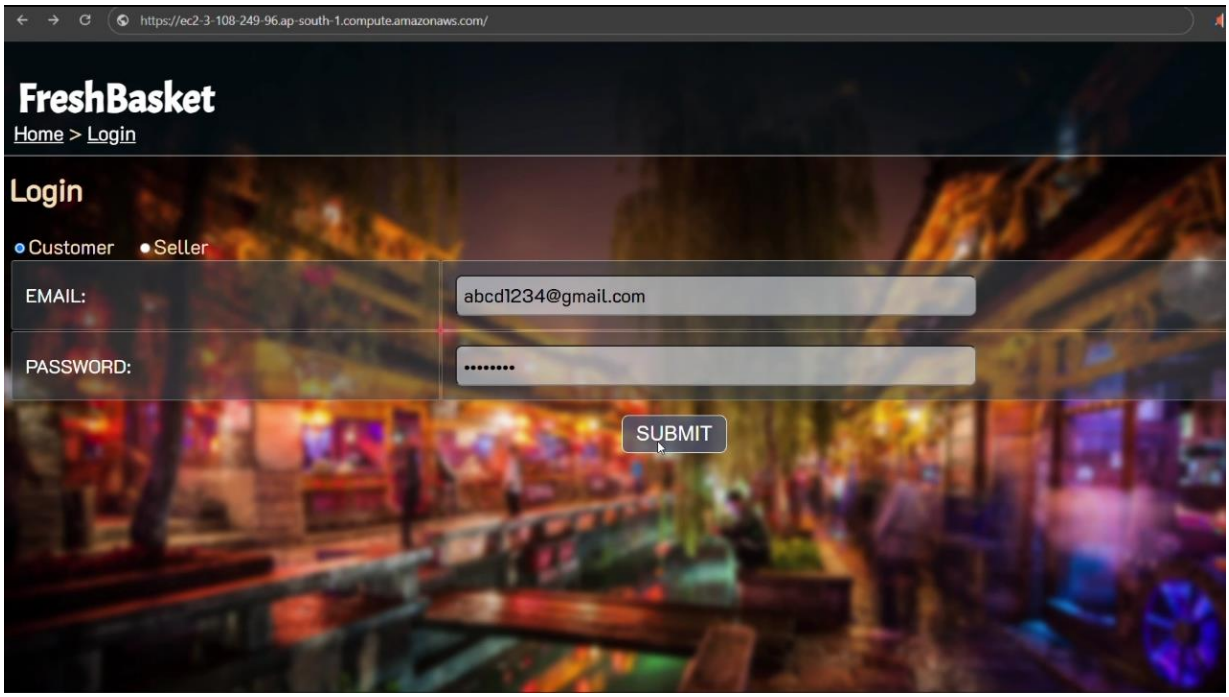
1. **Responsive Navigation**: The platform features a user-friendly design with intuitive menus and buttons, ensuring seamless navigation across different pages and devices. This design adapts to various screen sizes, providing a consistent user experience.
2. **Real-Time Cart Updates**: Changes made to the shopping cart, such as adding, removing, or updating items, are instantly reflected on the user interface. This enhances user convenience and ensures an accurate cart overview.
3. **Dynamic Search and Filtering**: The platform allows users to quickly find products by using keywords or applying category-based filters. This feature improves the shopping experience by saving time and narrowing down relevant options.

4. **Order Confirmation Feedback**: After a successful checkout, the platform displays the order status and detailed confirmation, including product summary and delivery information. This reassures users and completes the transaction process effectively.

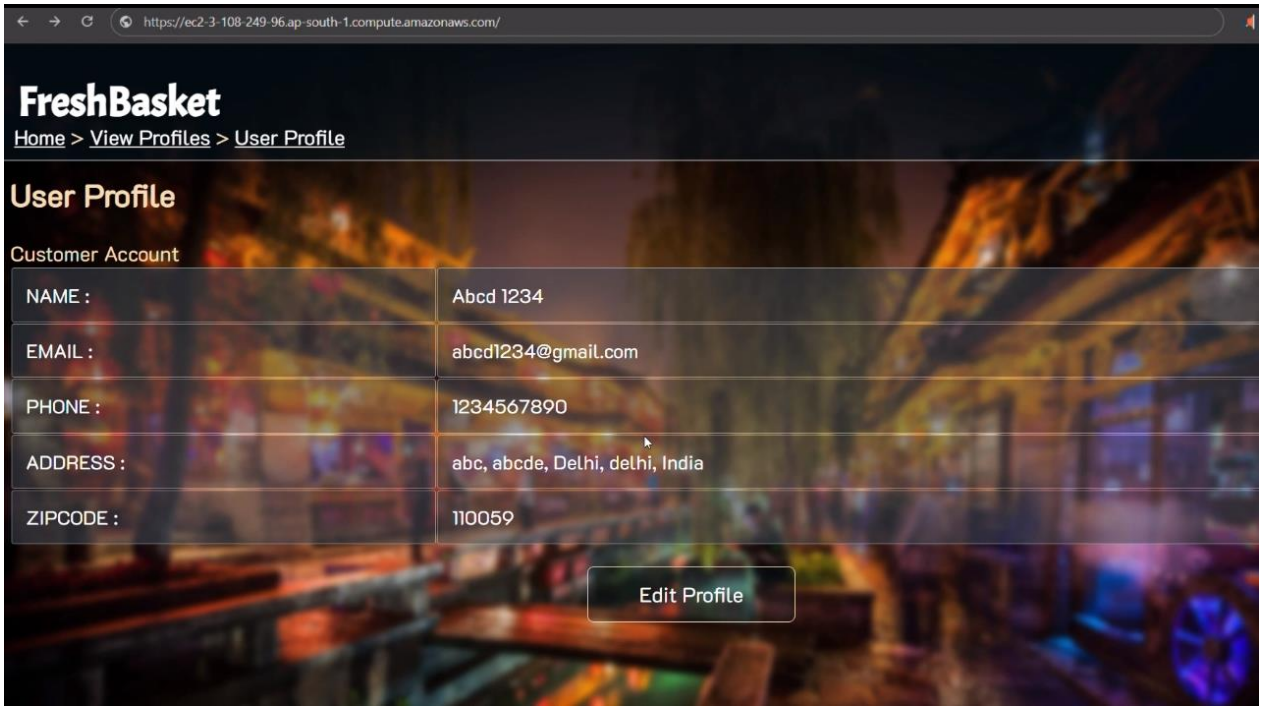
OUTPUT SCREENSHOTS:



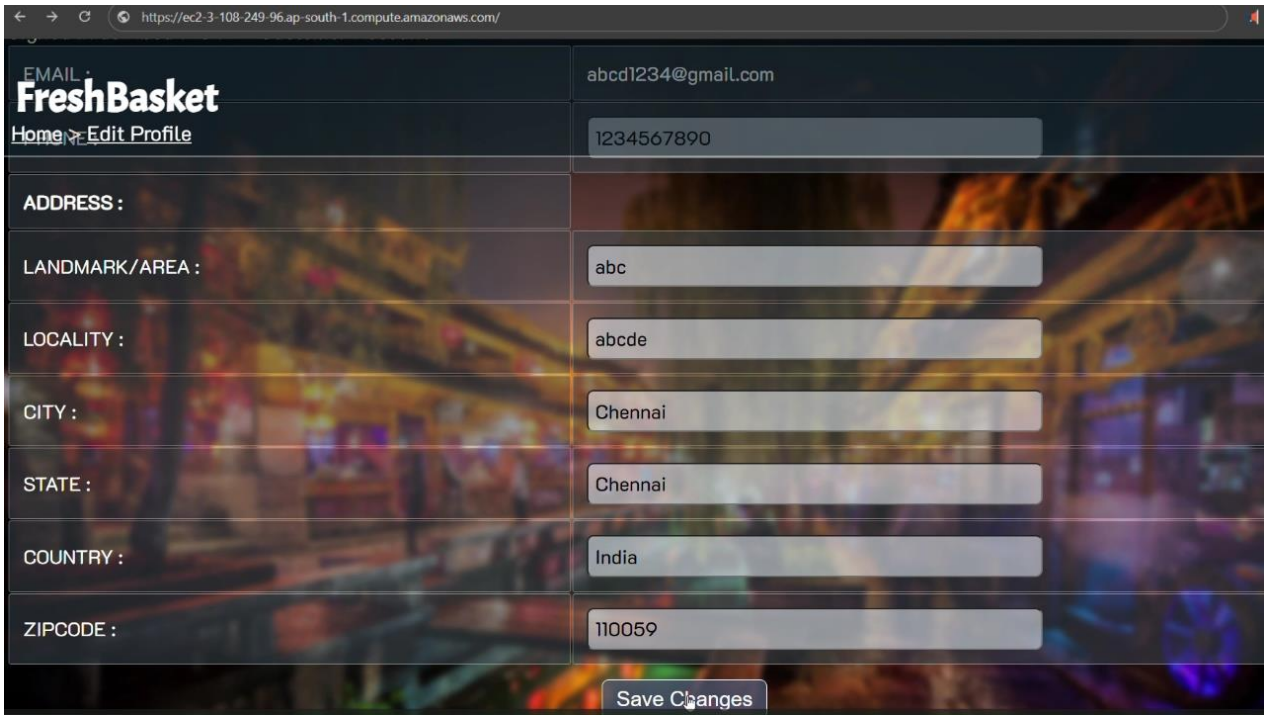
Home Page



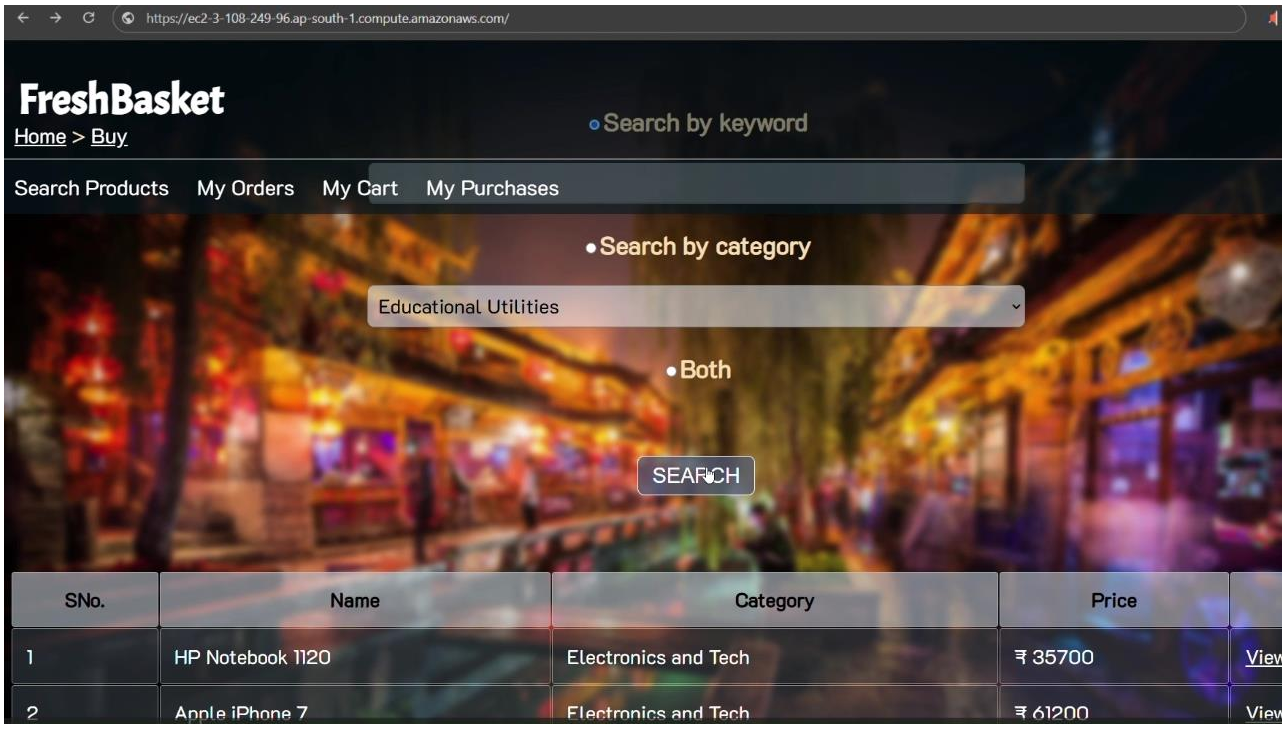
Login Page



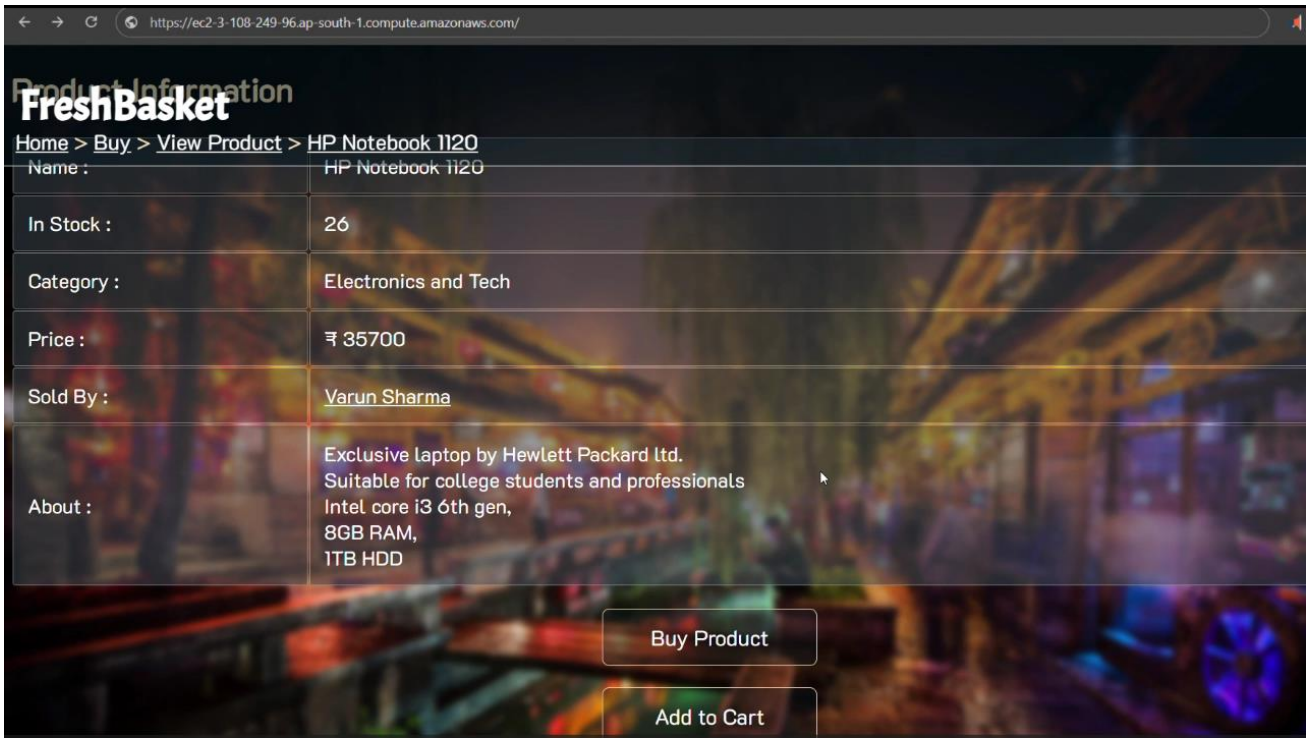
User Profile Page



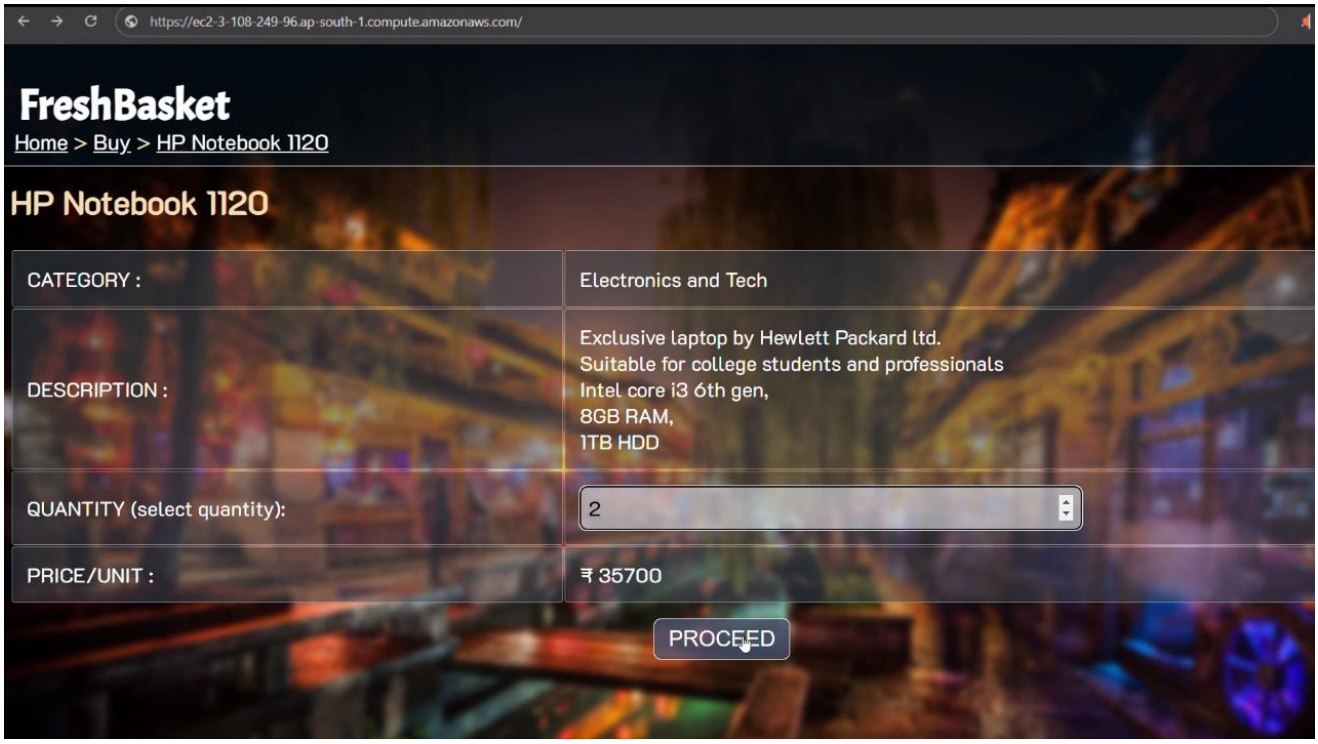
Editing the Address as Chennai



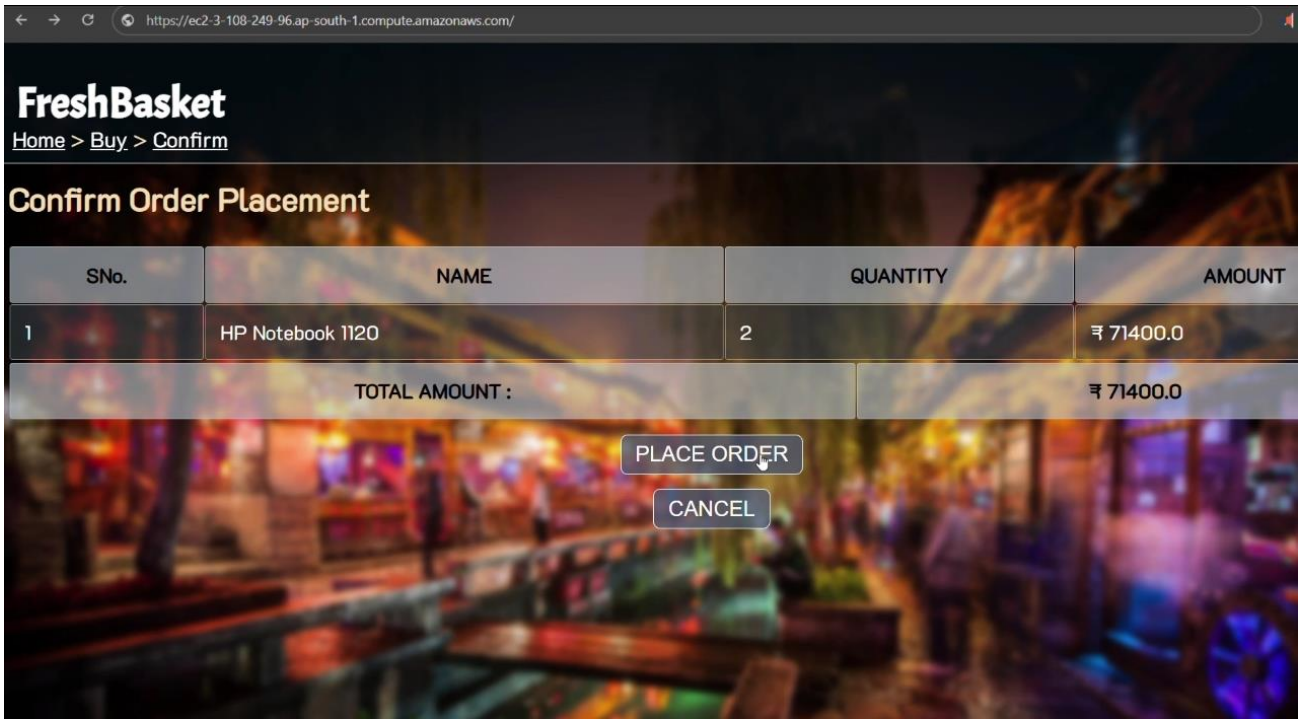
Searching a product by its category



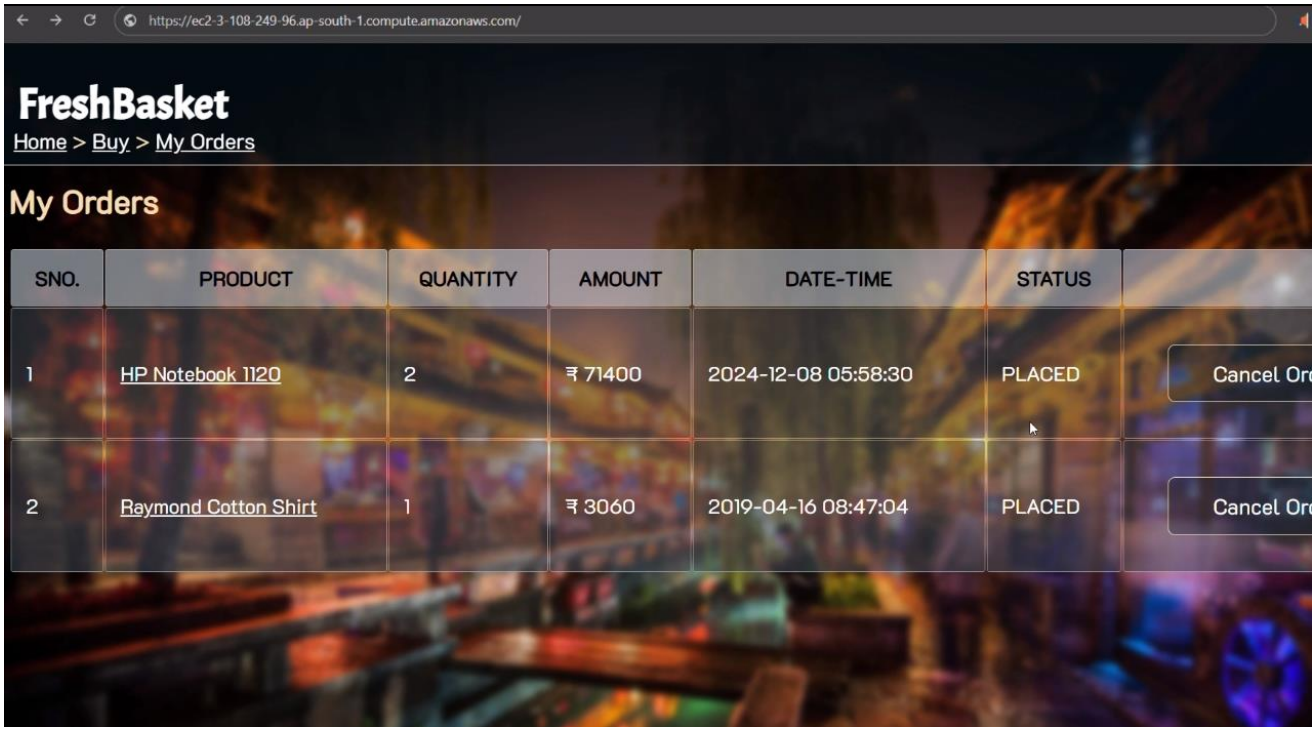
Adding a product to cart



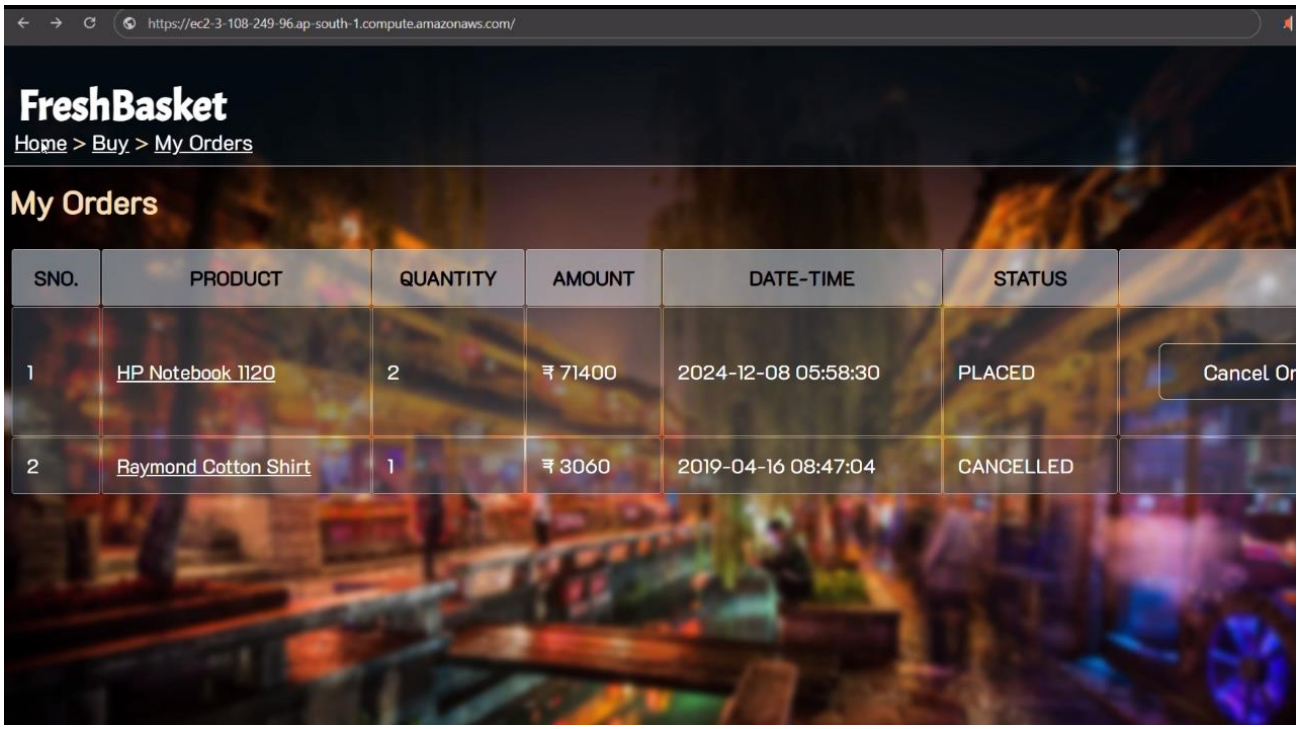
Buying the product



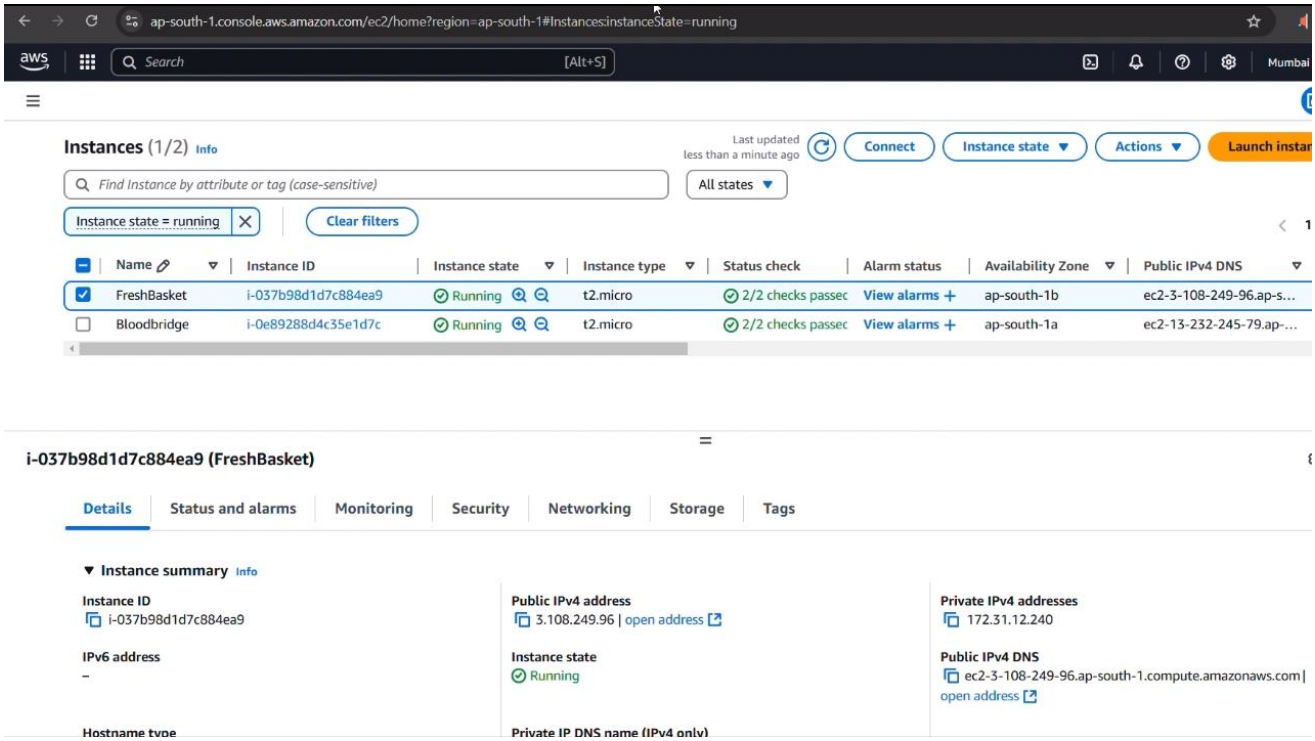
Confirming the order



Viewing my orders



Cancelling a confirmed order



FreshBasket Instance is running in the AWS EC2

CONCLUSION:

The FreshBasket project exemplifies a modern, cloud-based e-commerce solution by combining Flask's development simplicity with AWS’s powerful infrastructure services. Its modular design, scalability, and efficient database management make it a robust platform for managing the online retail of perishable goods.