Full Stack Development with MERN

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1. Introduction

Project Title: SB FOODS Food Ordering App

Team ID: NM2024TMID02433

Team Members:

1. **Sneha H** - *Frontend Developer & Team Lead*: Responsible for leading the team and developing the user interface, focusing on creating reusable UI components and ensuring a smooth user experience.
2. **Namitha M** - *Backend Developer*: Focuses on setting up server-side functionalities, implementing APIs, and managing data flow between the frontend and backend.
3. **Vijaya Dharshini K** - *Database Manager*: Manages database schema design, ensuring efficient data storage and retrieval for users, complaints, and messages.
4. **Sathiya R** - *Frontend Developer*: Works on styling and layout design using Bootstrap and Material UI to enhance the visual appeal and usability of the application.
5. **Vandana Kumari** - *Quality Assurance & Documentation*: Handles testing to ensure smooth functionality, along with documenting project development processes and user guidelines.

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2. Project Overview

Purpose:

The SB FOOD Food Ordering App is a full-featured, user-friendly platform built using the MERN stack (MongoDB, Express.js, React.js, Node.js) that enables customers to browse, order, and track meals online. Designed for efficient ordering and a seamless user experience, SB FOOD provides a robust, centralized platform for menu management, secure checkout, and real-time order tracking. This app aims to enhance customer convenience by integrating secure payment options, a comprehensive menu catalog, and a personalized ordering experience.

Features:

1. **User Registration and Authentication**: Users can create accounts to save their preferences, view past orders, and track current orders.
2. **Product Browsing and Filtering**: Users can browse products by category, use filters for quick searching, and view detailed product descriptions, images, and reviews.
3. **Shopping Cart and Checkout**: Users can add items to their cart, manage quantities, and proceed through a secure checkout process.
4. **Order Tracking and Notifications**: Customers receive updates on their order status and can track delivery in real-time.
5. **Admin Dashboard for Inventory Management**: Admin users can manage product listings, monitor inventory, and oversee order statuses.
6. **Security and Payment Integration**: The platform ensures data security through user authentication, encrypted transactions, and compliance with payment gateway standards.

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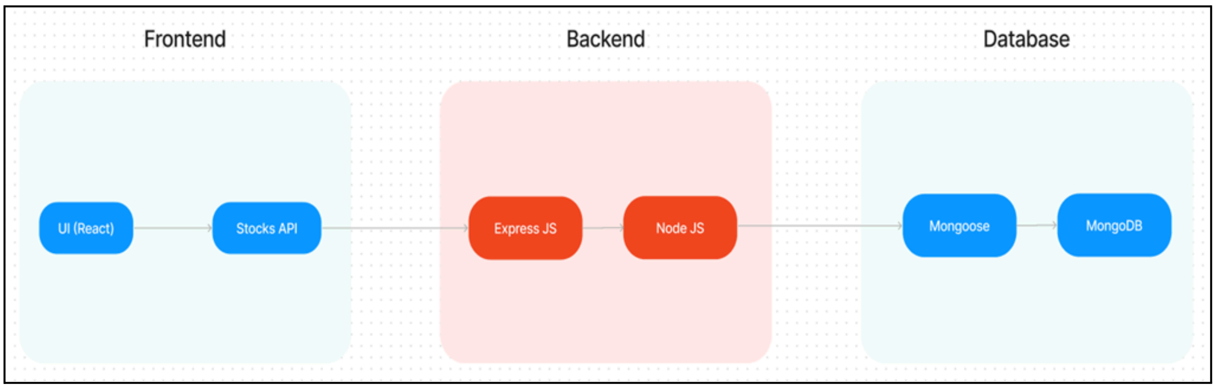
3. Architecture



Frontend:

- The frontend of SB FOOD Food Ordering App is built using React.js, providing a dynamic and responsive user interface. React enables a component-based architecture, allowing for reusable UI elements and efficient DOM updates, which enhance the user experience for ordering food seamlessly.

- Axios is used on the frontend to make RESTful API calls to the backend, enabling smooth data retrieval and updates, such as fetching the menu items, submitting orders, and retrieving order statuses in real-time.
- Bootstrap and Material UI are incorporated to create a visually appealing, user-friendly design across all devices. These libraries help ensure that SB FOOD is accessible and offers a consistent experience for all users, including both customers and restaurant administrators.

Backend:

- The backend of SB FOOD Food Ordering App is powered by Express.js, a lightweight and flexible Node.js framework that manages server-side logic, handles API endpoints, and processes requests from the frontend.
- RESTful APIs facilitate communication between the frontend and backend, enabling features such as user authentication, menu management, and order processing.

Database:

- MongoDB is the database used for the SB FOOD Food Ordering App, chosen for its flexibility and scalability. MongoDB enables efficient storage and retrieval of data, including user information, menu details, and order history. With its document-based structure, MongoDB can easily adapt to various data models required for food ordering, such as user profiles, active orders, and order records.
- MongoDB ensures high availability and fast access to critical data, supporting smooth user interactions and efficient order processing.

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4. Setup Instructions

Prerequisites:

To develop a full-stack food ordering application like SB FOOD using Node.js, Express.js, MongoDB, and React.js, the following prerequisites are essential:

Node.js and npm

- Node.js: A powerful JavaScript runtime environment that allows server-side JavaScript execution, providing a scalable platform for building network applications.

- Installation: Download Node.js and npm on your development machine for server-side JavaScript execution.

Express.js

- Express.js: A lightweight web application framework for Node.js. It simplifies the development of robust APIs and server logic with features like routing, middleware, and modular architecture.

  Installation: Open your command prompt or terminal and run:

```
npm install express
```

MongoDB

- MongoDB: A flexible and scalable NoSQL database that stores data in a JSON-like format, making it suitable for large data volumes in an online food ordering setting.
- Setup: Download MongoDB and configure it to store and retrieve application data such as user accounts, menu items, and order records.
- Database Connectivity: Use Mongoose, an ODM (Object-Document Mapping) library, to simplify interactions with MongoDB and perform CRUD operations. Guide for connecting Node.js and MongoDB with Mongoose.

React.js

- React.js: A JavaScript library for building user interfaces, enabling the creation of interactive and reusable UI components, ideal for dynamic food ordering applications.
- Installation: Follow the React installation guide to set up the user-facing part of SB FOOD, including menu browsing, order placement, and tracking features.

HTML, CSS, and JavaScript

- Basic knowledge of HTML (structure), CSS (styling), and JavaScript (interactivity) is essential for frontend development.

Front-end Libraries

- Material UI and Bootstrap: These libraries provide pre-designed components and responsive styling options, enhancing the user experience across different devices.

Version Control

- Git: Use Git for version control to facilitate collaboration and track changes. Platforms like GitHub or Bitbucket can host your repository.
- Download Git: Installation instructions for setting up Git on your system.

Development Environment

- Choose a code editor or IDE that best suits your workflow, such as Visual Studio Code, Sublime Text, or WebStorm.
- Visual Studio Code: Download here.

Setting Up the Project

Clone the Repository:

Open your terminal or command prompt and navigate to the directory where you want to store the SB FOOD Food Ordering App.
Clone the repository with:

```
git clone https://github.com/your-username/sb-food.git
```

Install Dependencies:

Navigate into the cloned repository directory:

```
cd sb-food
```

Install frontend dependencies:

```
cd client

npm install
```

Install backend dependencies:

```
cd ../server

npm install
```

Start the Development Server:

To start the development server, execute the following command:

```
npm start
```

The SB FOOD Food Ordering App will be accessible at http://localhost:3000.

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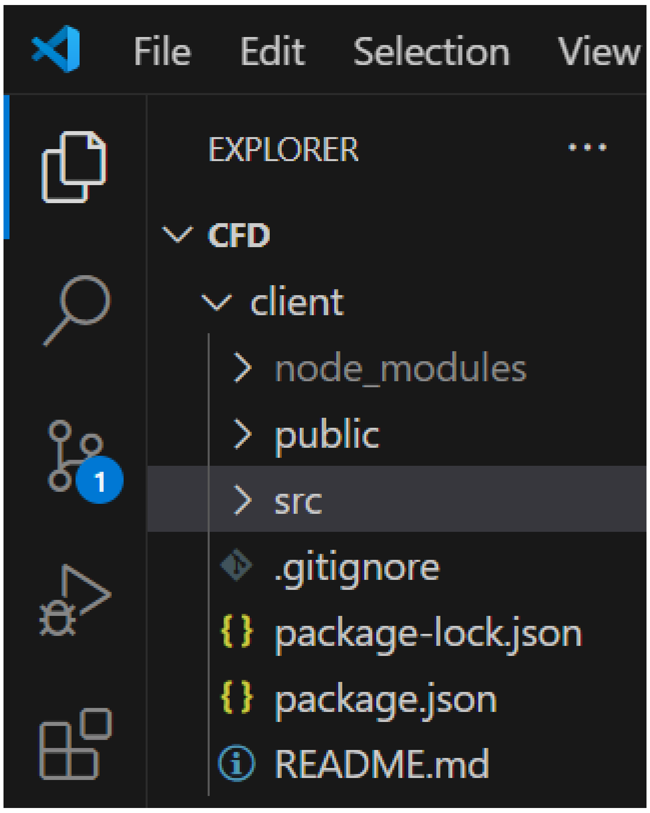
5. Folder Structure

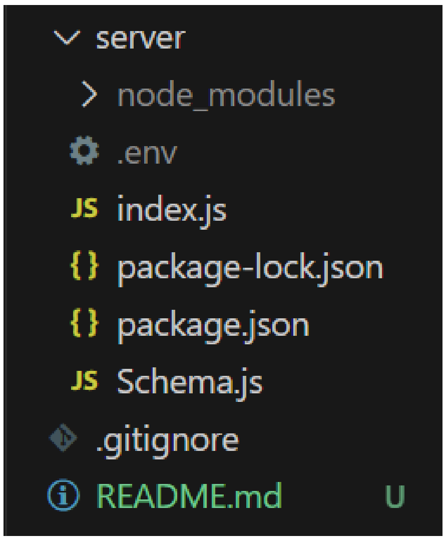
Client:



```
CFD
  client
    node_modules
    public
    src
    .gitignore
    package-lock.json
    package.json
    README.md
```

The `client` directory contains all frontend files, organized into components, pages, services, and assets. Reusable UI components are structured to ensure modular and scalable code for an optimized user experience.

Server:



```
server
  node_modules
  .env
  index.js
  package-lock.json
  package.json
  Schema.js
.gitignore
README.md        U
```

The `server` directory contains backend logic, API routes, and database configurations. Modular routes handle functionalities like user authentication, menu management, and order processing, ensuring efficient and maintainable backend operations.

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6. Running the Application

To successfully launch and run the SB FOOD Food Ordering App, the frontend and backend need to be started separately, as they are developed independently. This guide outlines the steps to set up and run both components, ensuring seamless connectivity for full functionality.

- **Running the Frontend**

The frontend of SB FOOD is a React-based application handling the user interface and all client-side operations. This includes displaying menu items, managing user interactions, and handling API requests to the backend for data retrieval and updates. Follow these steps to run the frontend:

- **Navigate to the Client Directory**:
  - Open your terminal or command prompt.
  - Navigate to the directory where the frontend code is located, typically named

`client`

Example command:

```
cd client
```

- **Install Dependencies**:

  Ensure all dependencies are installed by running:

```
npm install
```

- **Start the Frontend Server**:

  Start the React development server with:

```
npm start
```

  - This command will launch the application on `http://localhost:3000` by default. You should see the SB FOOD home page if everything is set up correctly.
  - The frontend server supports live reloading, so any code changes will automatically update in the browser.

- **Check Frontend Components:**
  - Ensure that key components like the home page, menu pages, and user profile page render correctly.
  - Verify that the navigation system allows smooth access to different sections of the app.

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2. Running the Backend

The backend of SB FOOD is powered by Express.js, handling server-side logic, data processing, and interactions with the MongoDB database. The backend provides APIs for menu retrieval, user authentication, and order management. To run the backend, proceed as follows:

- **Navigate to the Server Directory**:

    - Open a new terminal window or tab.
    - Move to the directory where the backend code is located, typically named `server`.

Example command:

```
cd server
```

- **Install Backend Dependencies**:

Run the following command to install required packages:

```
npm install
```

- **Configure Environment Variables**:
    - Ensure that environment variables, such as the database URI and authentication keys, are correctly configured in a `.env` file within the backend directory. This file should include:
        - `DB_URI`: Connection string for MongoDB.
        - `JWT_SECRET`: Secret key for JSON Web Token (JWT) authentication.
        - `PORT`: Port on which the backend server will run (if different from the default).

- **Start the Backend Server**:

Start the backend server by running:

```
npm start
```

    - This command will initiate the server on `http://localhost:5000` (or the specified port).
    - The backend server will listen for API requests from the frontend, responding with data or processing updates as needed.
    -

- **Verify API Endpoints**:

- Once the backend server is running, verify key API endpoints like `/api/menu`, `/api/users`, and `/api/orders` to ensure they are accessible and working correctly. These endpoints are essential for functionalities like menu listing, user registration, and order placement.

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3. Testing the Full Application

With both the frontend and backend running, open the browser and navigate to `http://localhost:3000` to access SB FOOD. Test the following core functionalities:

- **User Authentication**: Confirm that user registration, login, and profile management work as expected.
- **Menu Interaction**: Ensure that menu items load from the backend and that features like adding items to the order function correctly.
- **Order Management**: Check that users can place orders, view order history, and track status updates.

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7. API Documentation:

The SB FOOD backend API provides endpoints to manage user actions, menu handling, order processing, and support requests. Each endpoint is designed to handle specific requests and streamline interactions between the frontend and backend.

1. User Authentication Endpoints

These endpoints manage user registration, login, and profile access for secure user interactions.

- **Register a New User**
  - **Endpoint**: `/api/users/register`
  - **Method**: POST
  - **Description**: Registers a new user with their name, email, password, and phone number.
  - **Parameters**: `name`, `email`, `password`, `phone`
- **Login User**

    - **Endpoint**: `/api/users/login`
    - **Method**: POST
    - **Description**: Authenticates the user and provides a session token if credentials are valid.
    - **Parameters**: `email`, `password`
- **User Profile**
    - **Endpoint**: `/api/users/profile`
    - **Method**: GET
    - **Description**: Retrieves the profile information of the authenticated user.
    - **Parameters**: Requires authentication token.

2. Menu Management Endpoints

These endpoints allow users to view and interact with the menu items.

- **Get All Menu Items**
    - **Endpoint**: `/api/menu`
    - **Method**: GET
    - **Description**: Fetches a list of all available menu items.
    - **Parameters**: None.
- **Get Menu Item Details**
    - **Endpoint**: `/api/menu/:id`
    - **Method**: GET
    - **Description**: Retrieves detailed information about a specific menu item.
    - **Parameters**: `id` (Menu Item ID)

3. Order Processing Endpoints

These endpoints handle order placement and tracking for users.

- **Place an Order**
    - **Endpoint**: `/api/orders`
    - **Method**: POST
    - **Description**: Places a new order with a list of selected menu items.
    - **Parameters**: `userId`, `items` (array with menu item ID and quantity)
- **Get Order Status**
    - **Endpoint**: `/api/orders/:orderId`
    - **Method**: GET
    - **Description**: Retrieves the current status of a specific order.
    - **Parameters**: `orderId` (Order ID)

4. Support and Feedback Endpoints

These endpoints enable users to submit feedback or register issues and communicate with support agents.

- **Submit a Feedback or Issue**
  - **Endpoint**: `/api/support`
  - **Method**: POST
  - **Description**: Registers a new feedback or issue related to an order or menu item.
  - **Parameters**: `userId`, `menuItemId`, `description`
- **Get Issue Status**
  - **Endpoint**: `/api/support/:issueId`
  - **Method**: GET
  - **Description**: Retrieves the current status of a specific issue or feedback submission.
  - **Parameters**: `issueId` (Issue ID)
- **Message Support Agent**
  - **Endpoint**: `/api/chat`
  - **Method**: POST
  - **Description**: Allows users and agents to send messages related to a support issue.
  - **Parameters**: `issueId`, `userId`, `message`

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8. Authentication

In SB FOOD, secure user authentication is managed through JSON Web Tokens (JWT), ensuring that only authorized users can access protected resources and functionalities. This setup is essential for maintaining data security and enforcing access control based on user roles.

JWT-Based Authentication Process

1. **User Login and Token Generation**:
    - Upon successful login, SB FOOD generates a JWT for the user. This token contains encoded information such as the user's ID and role (e.g., customer or admin).
    - The JWT is then sent to the user's client-side application, where it is stored (typically in local storage or cookies) for subsequent requests.
2. **Token Validation for Protected Routes**:
    - For each protected route, SB FOOD requires a valid JWT in the request headers.
    - The backend validates the JWT to ensure that only authenticated users can access protected resources.

Role-Based Access Control (RBAC)

SB FOOD uses role-based access control to restrict certain routes and functionalities based on the user's role. Key aspects include:

- **User Roles**:
    - **Customer**: Can view menu items, place orders, and submit support issues.
    - **Admin**: Has access to manage menu items, orders, support requests, and user profiles.
- **Protected Routes**:
    - Only users with a valid JWT can access routes such as profile management, order placement, support submission, and communication with support agents.
    - Administrative functionalities, like menu management and order review, are restricted to users with an admin role, ensuring only authorized personnel can modify critical resources.

Session Management and Expiration

- SB FOOD implements session expiration to enhance security. JWTs are designed to expire after a set period, requiring users to log in again to obtain a new token.
- When a token expires, users must re-authenticate to maintain access, reducing the risk of unauthorised access from prolonged sessions.

Middleware for Authorization Control

The SB FOOD backend employs custom middleware to manage authentication and authorization:

- **Authentication Middleware**: Validates the JWT in incoming requests. If the token is invalid or absent, the request is denied.
- **Authorization Middleware**: Checks the user role associated with the JWT, granting or restricting access to specific routes based on role requirements.

This JWT-based approach allows SB FOOD to maintain a secure, role-based access environment, ensuring only authorised users can interact with sensitive resources.

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9. User Interface

The SB FOOD Food Ordering App is crafted with a user-friendly and intuitive interface to enhance the online ordering experience for customers. Below is an overview of the main UI features, detailing primary sections like the Home Page, Menu Page, and Cart Page.

Home Page

- **Overview**:
  - The SB FOOD Home Page welcomes users with a visually engaging layout that features popular dishes, special offers, and banners for seasonal promotions.
  - The page includes a search bar and category navigation for easy browsing of various cuisines or food types.
- **Key Features**:
  - **Cuisine Categories**: Displayed prominently to help users quickly navigate to their preferred food types (e.g., Appetisers, Main Courses, Desserts).
  - **Promotions & Banners**: Highlights of special deals, new menu items, or seasonal dishes to draw user attention.
  - **Responsive Design**: Optimised for both desktop and mobile devices to ensure a seamless experience across different platforms.

Menu Page

- **Overview**:
  - The Menu Page provides detailed information for each dish, including images, descriptions, prices, and availability.
  - Users can view multiple images of a dish, read ingredient lists, and check dietary labels (e.g., vegan, gluten-free) before ordering.
- **Key Features**:
  - **Detailed Dish Information**: Each item displays a comprehensive description, including ingredients, serving size, and chef notes.
  - **Dish Ratings and Reviews**: Users can view ratings and customer reviews to help decide on their order.
  - **Add to Cart and Favourites**: Convenient buttons allow users to add items to their cart or save to their favourites for future orders.
  - **Quantity Selection**: Users can choose the quantity of each dish before adding it to the cart for a smooth ordering process.

Cart Page

- **Overview**:
  - The Cart Page provides users with a summary of items they plan to order, with options to modify quantities or remove dishes.
  - It includes a subtotal summary, any applied discounts, and a checkout button for quick progression to the payment process.
- **Key Features**:
  - **Order Summary**: Displays each dish in the cart, with quantity, price per item, and total for easy review.
  - **Editable Quantity and Removal**: Users can adjust quantities or remove items directly within the cart, ensuring flexibility before checkout.
  - **Cost Breakdown and Checkout**: Provides a clear breakdown of subtotal, taxes, and any applicable discounts, along with a prominent checkout button to start the payment process.

The SB FOOD app's user interface is designed to create a straightforward, engaging ordering experience, making it easy for users to browse, customize, and place orders smoothly.

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10. Testing

A thorough testing strategy is crucial for SB FOOD Food Ordering App to ensure it operates smoothly and reliably while providing a seamless user experience. This strategy covers both backend and frontend testing, applying various methodologies to test individual functions, API interactions, and user flows.

Unit Testing for Backend Logic

- **Objective**:
  - Unit tests ensure that individual backend functions work correctly in isolation. This includes core logic for managing users, dishes, orders, and transactions.
- **Implementation**:
  - **Jest and Mocha** are used for unit testing backend functions, including data validation, authentication, order calculations, and CRUD operations on dishes and users.
  - **Mocking libraries** like Sinon simulate database calls and dependencies, ensuring tests run independently of the actual database.
- **Examples**:
  - **User Authentication**: Tests validate login, JWT generation, and role-based access to protected routes.
  - **Order Calculations**: Ensures that calculations for order totals, taxes, and discounts are accurate and that inventory adjustments are correctly handled.

Integration Testing for API Routes

- **Objective**:
  - Integration tests verify that API endpoints handle requests and responses accurately, ensuring seamless interactions between backend components.
- **Implementation**:
  - Using **Jest and Mocha**, integration tests cover key routes for user registration, login, dish retrieval, order placement, and cart management.
  - Mock databases are employed with **MongoDB in-memory server** to simulate database interactions, allowing tests to verify data handling consistency.
- **Examples**:
  - **User Registration and Login**: Tests validate input data, error handling, and JWT issuance.
  - **Dish API Endpoints**: Verifies dish retrieval, filtering options (e.g., cuisine type or dietary preferences), and pagination, ensuring the user can browse the menu smoothly.

UI Testing for React Components

- **Objective**:
  - UI testing confirms that React components render and behave as expected, focusing on layout, interactions, and navigation within the SB FOOD frontend.
- **Implementation**:
  - **Jest and React Testing Library** are used to test individual components, ensuring they display correctly and respond properly to user interactions.
  - **End-to-end testing** with **Cypress** simulates real user journeys, such as navigating the menu, adding items to the cart, and placing an order.
- **Examples**:
  - **Cart Component**: Ensures items added to the cart are accurately displayed, with correct quantities and pricing.
  - **Checkout Flow**: Tests the entire checkout process, verifying that users can complete their orders without errors.

This comprehensive testing strategy helps SB FOOD deliver a high-quality food ordering experience by ensuring reliability, functional accuracy, and user satisfaction.

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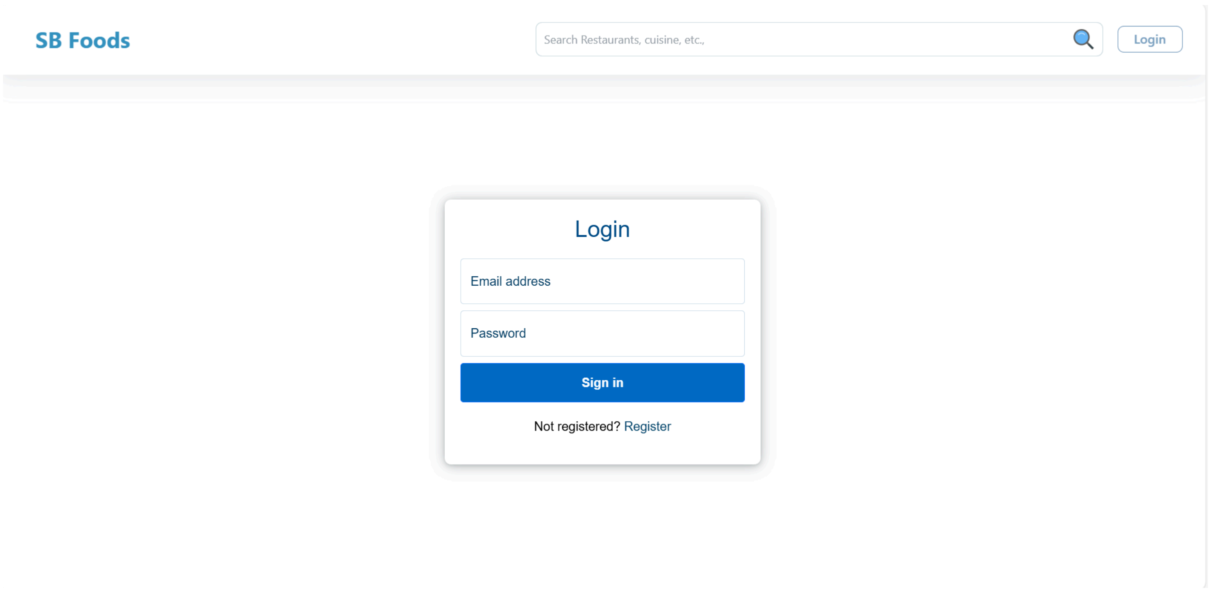
11. Screenshots or Demo

1. Login Page

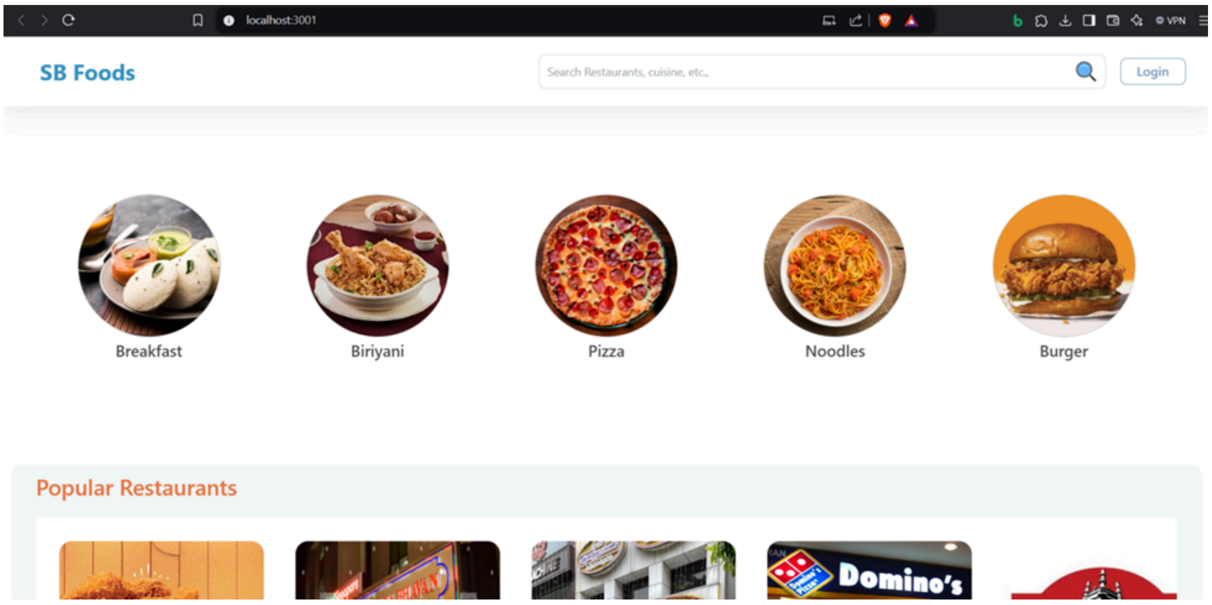


- **Description**:
    - The login page serves as the entry point for users into the SB FOOD Food Ordering App. Users can log in using their registered credentials to access personalised features, view past orders, and manage their profiles.
- **Features**:
    - **Email and Password Fields**: Clearly labeled input fields for users to enter their email address and password.
    - **"Forgot Password" Option**: A link to help users recover their credentials, ensuring a smooth experience even if they forget their password.
    - **Error Handling**: If login attempts fail due to incorrect credentials, the page displays a clear error message to guide users toward resolving the issue.

The login page aims to be straightforward and user-friendly, facilitating quick access for returning users while maintaining account security.

2. Landing Page (Home Page)

- **Description**:
    - The landing page is the first point of interaction for users in the **SB FOOD Food Ordering App**. It presents a clean, straightforward interface that highlights featured food items, categories, and an easy-to-navigate design to help users quickly find their desired meals.

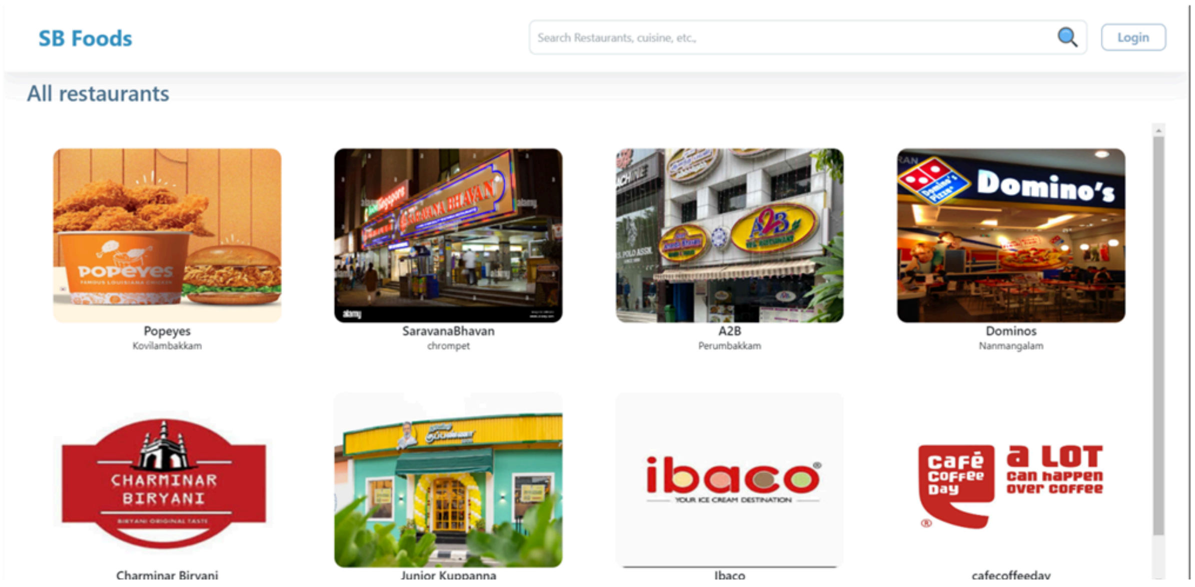


- **Features**:
    - **Product Listings**: A selection of popular or featured food items displayed with images, names, and brief descriptions. Each listing links to a detailed product page for more information.
    - **Search Bar**: A prominently placed search bar that enables users to quickly find specific dishes, restaurants, or food types.
    - **Product Categories**: Clearly organized food categories (e.g., Pizza, Burgers, Desserts, etc.) for easy navigation, allowing users to browse food based on their preferences.

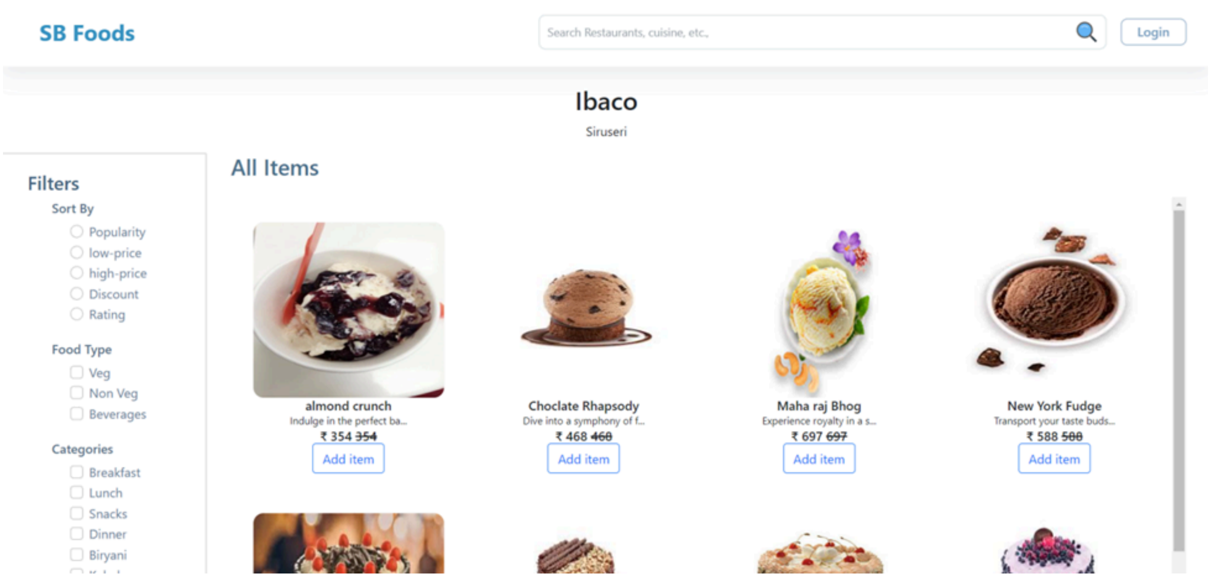
The **SB FOOD Food Ordering App** home page focuses on offering a streamlined browsing experience, highlighting popular products and providing an efficient way for users to explore the menu and place orders.

3. Restaurant Page

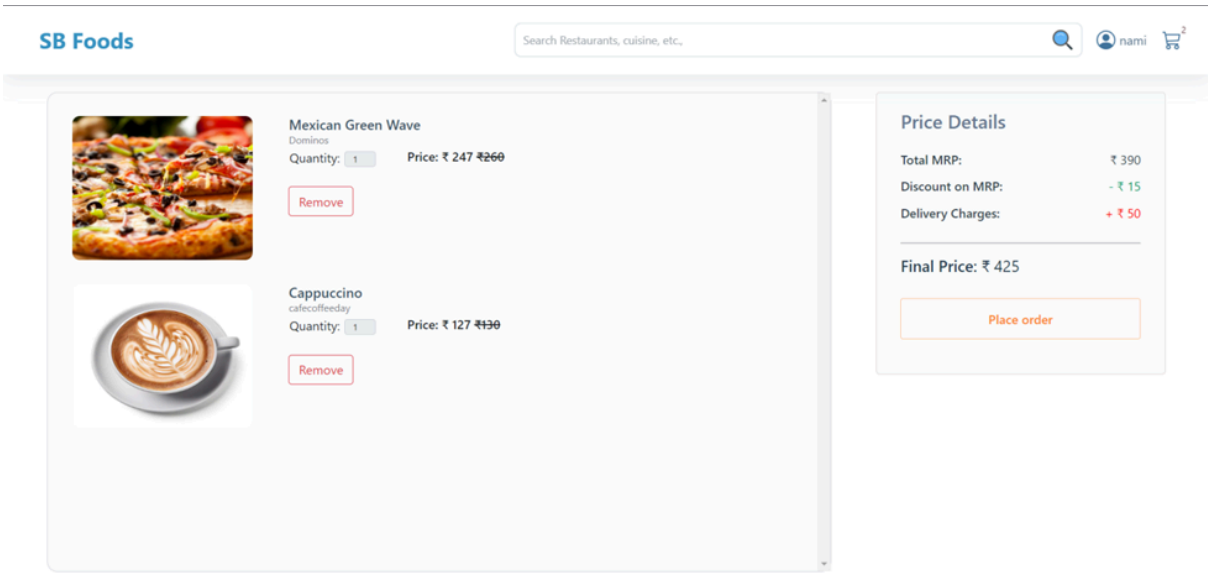
- **Description**:
  The **Restaurant Page** in the SB FOOD Food Ordering App showcases all the essential details of a selected restaurant. It serves as the main interface for users to explore the restaurant's menu, view prices, and place orders. This page aims to provide a seamless and informative experience that encourages users to complete their food orders.



- **Features**:
    - **Restaurant Information**:
      The top section of the page includes essential details about the restaurant such as:
        - **Restaurant Name**
        - **Cuisine Type** (e.g., Italian, Chinese, etc.)
        - **Ratings and Reviews**: Users can view ratings and read reviews from other customers to help make decisions.
        - **Restaurant Address** and **Contact Information**: Easily accessible for users to know where the restaurant is located and how to contact them.
    - **Menu Items**:
      The restaurant's menu is displayed below the restaurant information, with categorised sections for different meal types such as appetizers, main courses, desserts, and drinks.



        - **Food Images**: Each menu item has an image to give users a better idea of what they are ordering.
        - **Item Details**: Includes the dish name, description, price, and a button to add it to the cart.
    - **Add to Cart**:
      Users can add multiple menu items to their cart directly from the restaurant page. The cart will display a summary of the selected items with prices and quantities.


SB Foods

Search Restaurants, cuisine, etc.,

nami

Mexican Green Wave
Dominos
Quantity: 1 Price: ₹ 247 ~~₹260~~

Remove

Cappuccino
cafecoffeeday
Quantity: 1 Price: ₹ 127 ~~₹130~~

Remove

Price Details

Total MRP:	₹ 390
Discount on MRP:	- ₹ 15
Delivery Charges:	+ ₹ 50

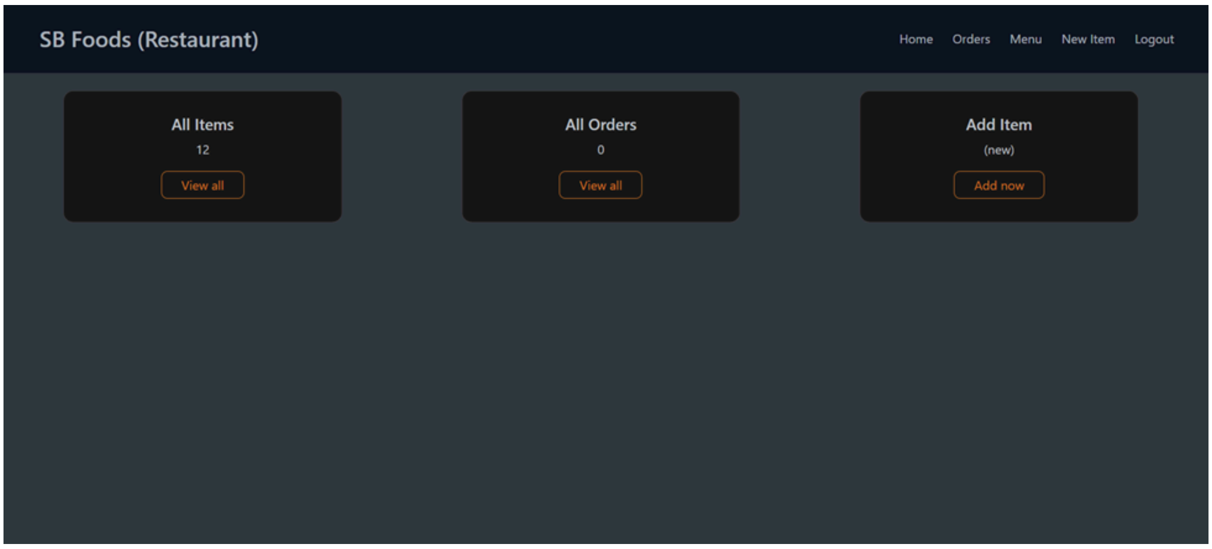
Final Price: ₹ 425

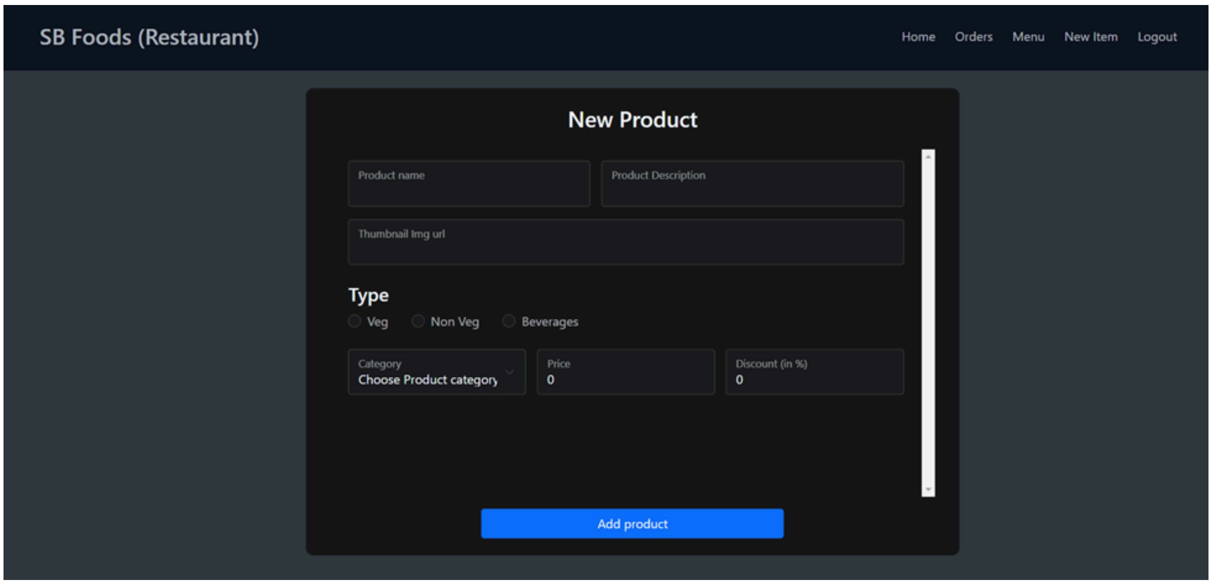
Place order

  - **Order Summary and Checkout Button**:
    After selecting their items, users can view the total order price and proceed to checkout by clicking the **Checkout** button. The button will guide users through the checkout process, where they can enter delivery information and payment details.
  - **Restaurant Reviews**:
    The page features a review section where users can read and write reviews about their dining experience at the restaurant. Ratings help other users make informed decisions when choosing a restaurant.
- **Navigation**:
  - **Back to Landing Page**: A button or link that allows users to return to the homepage, where they can choose another restaurant.
  - **Customer Support**: A link to customer service in case users encounter issues with their order or have questions about the restaurant.

4. Admin Dashboard

- **Description**:
  The **Admin Dashboard** of the **SB FOOD Food Ordering App** provides a centralized interface for administrators to manage platform operations. It enables the admin to efficiently monitor active users, manage restaurant listings, and oversee the order lifecycle, ensuring smooth platform performance.
- **Features**:
  - **Overview of Active Users, Products, and Orders**: The dashboard provides a real-time overview of the number of active users, products available on the platform, and the current status of orders (pending, completed, etc.). This gives administrators quick insights into the platform's activity.





- **Product Management**: Administrators can add new products, update existing product details (e.g., pricing, description, availability), or remove outdated items from the platform.
- **Order Management**: Admins have access to the order management section, where they can view details of incoming orders, process them, and track their progress. This feature allows administrators to ensure timely fulfillment and address any issues related to customer orders.

The admin dashboard is designed to simplify and streamline the management of the food ordering platform, providing all necessary tools for effective system monitoring and management.

Before starting to work on this project, let’s see the demo.

Project demo:

https://drive.google.com/file/d/1h83o5MQGps5zbXJEyjU-CW8hKwnBvIk8/view?usp=sharing

follow the videos below for better understanding.

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12. Known Issues

Here are some known issues and potential improvements for the **SB FOOD Food Ordering App**, along with suggestions to enhance the user experience and overall system performance:

1. Loading Speed with Large Product Data Sets

- **Issue**: The platform experiences slower load times when displaying large catalogs of restaurant menus or food items, especially with hundreds or thousands of products listed.
- **Potential Improvements**:
    - **Pagination**: Introduce pagination or infinite scrolling to display a manageable number of items at once, improving load times.
    - **Lazy Loading**: Use lazy loading to only load images and details as they come into view on the user’s screen.
    - **Database Indexing**: Optimise MongoDB queries and indexes to speed up data retrieval for large data sets, ensuring efficient access to product information.

2. Slow Checkout Process on High Traffic

- **Issue**: The checkout process may become slow when many users are placing orders simultaneously. This is due to concurrent database operations like order placements, inventory updates, and user authentication.

    - **Caching**: Implement caching for frequently accessed data, such as restaurant menus and product details, to reduce database load during high traffic.
    - **Asynchronous Processing**: Offload tasks like payment processing and inventory checks to background jobs, ensuring the checkout process remains responsive.

3. Incomplete Error Handling for Failed Payments

- **Issue**: When a payment fails or is interrupted, the system may not provide clear or actionable error messages, which can confuse users.
- **Potential Improvements**:
  - **Improved Error Messages**: Enhance error handling for payment failures by providing more specific, user-friendly messages and instructions for retrying or checking payment details.
  - **Transaction Logs**: Implement better logging for failed transactions, allowing admins and support teams to quickly diagnose and resolve payment issues.

4. Admin Dashboard Performance

- **Issue**: The admin dashboard may experience performance issues when handling large sets of data, such as users, orders, or restaurant details. This can lead to delays when trying to manage or track orders.
- **Potential Improvements**:
  - **Data Filtering**: Introduce filtering and search options to allow admins to narrow down data queries, reducing the load and improving responsiveness.
  - **Background Data Processing**: Move data-intensive operations to background processes to improve the dashboard's responsiveness and prevent slowdowns.

5. Inconsistent Mobile Layouts

- **Issue**: Some UI components may not be displayed optimally on smaller mobile screens, leading to a poor user experience.
- **Potential Improvements**:
  - **Mobile Optimization**: Enhance CSS media queries to ensure that all UI components adapt seamlessly to different screen sizes, particularly on small mobile devices.
  - **Responsive Testing**: Conduct extensive testing on various mobile devices to identify and fix layout inconsistencies for improved mobile user experience.

6. Limited Payment Gateway Options

- **Issue**: The application currently supports only a few payment gateways, which may be limiting for users who prefer other payment methods.
- **Potential Improvements**:
  - **Add More Payment Options**: Integrate additional payment gateways like **PayPal**, **Stripe**, or regional/local payment systems to accommodate a broader user base and improve the payment experience.

7. Incomplete User Authentication Flow

- **Issue**: The user authentication flow could be enhanced with additional security measures, such as **multi-factor authentication (MFA)** and **password strength indicators**.
- **Potential Improvements**:
    - **Multi-Factor Authentication (MFA)**: Introduce MFA for all user accounts to improve security and reduce the risk of unauthorized access.
    - **Password Strength Indicators**: Add password strength indicators during the registration and password change processes to ensure users create strong, secure passwords.

8. Lack of Advanced Search Features

- **Issue**: The search functionality is basic and may not offer enough filtering options for users who want to narrow down results based on specific food attributes, such as price, type, or restaurant location.
- **Potential Improvements**:
    - **Advanced Filters**: Add advanced search filters to enable users to filter results by attributes such as price range, cuisine type, or dietary preferences.
    - **Search Suggestions**: Implement search suggestions or autocomplete to help users find items more quickly, improving the overall search experience.

13. Future Enhancements

As **SB FOOD** continues to grow, there are several exciting features and improvements that can enhance the user experience, increase operational efficiency, and expand the platform's reach. Below are some potential future enhancements for the platform:

1. AI-Powered Product Recommendations

- **Feature**: Integrating AI algorithms to offer personalized product recommendations based on user behavior, preferences, and past interactions.
- **Benefits**:
    - **Improved User Experience**: Personalized suggestions help customers discover relevant products more easily.
    - **Increased Sales**: By offering tailored recommendations, SB FOOD can boost cross-selling and upselling opportunities.
- **Implementation**:
    - Use machine learning to analyze user browsing and purchase history to predict products they may be interested in.
    - Display recommendations on key pages like the homepage, product pages, and cart to increase visibility.

2. Enhanced Order Tracking

- **Feature**: Offering real-time, detailed order tracking with notifications for key stages in the order process.
- **Benefits**:
    - **Transparency**: Customers will feel more in control of their orders with up-to-date status information.
    - **Customer Engagement**: Automated notifications will keep users informed via email or SMS at important points, such as when their order is shipped or out for delivery.
- **Implementation**:
    - Integrate APIs from shipping carriers to pull live tracking data and display it on the user interface.
    - Allow users to track multiple orders simultaneously and provide estimated delivery times.

3. Chatbots for Customer Support

- **Feature**: AI-driven chatbots that provide 24/7 real-time assistance for customer inquiries regarding products, orders, or general support.
- **Benefits**:
    - **24/7 Availability**: Customers can get immediate answers to their questions at any time.
    - **Efficiency**: Chatbots can handle repetitive queries, freeing up customer support agents for more complex issues.
    - **Cost Reduction**: Automation reduces the need for human agents to handle routine tasks, leading to savings in operational costs.
- **Implementation**:
    - Integrate AI chatbot platforms like **Dialogflow** or **Microsoft Bot Framework** for natural language processing and real-time interaction.
    - Train the chatbot to handle common queries, such as checking order status, product availability, and troubleshooting.

4. Multi-Language and Multi-Currency Support

- **Feature**: Adding multi-language and multi-currency support to cater to a global audience.
- **Benefits**:
    - **Global Reach**: Expands the platform's audience to non-English speakers and international customers.
    - **Localised Experience**: Customers can shop in their preferred language and currency, creating a personalised and seamless experience.
- **Implementation**:
    - Use localization frameworks to automatically adjust text, dates, and currency formatting based on user preferences.

    - Integrate international payment gateways that support multi-currency transactions.

5. Enhanced Admin Dashboard

- **Feature**: Upgrading the admin dashboard with advanced data analytics and reporting tools to help admins make data-driven decisions.
- **Benefits**:
    - **Business Insights**: Admins will have access to detailed reports on sales trends, customer behavior, and inventory status.
    - **Efficiency**: Streamlined access to data can help admins quickly adjust stock, promotions, and customer support strategies.
- **Implementation**:
    - Integrate data analytics tools like **Google Analytics** or custom reporting systems to provide insights into user engagement, sales performance, and campaign effectiveness.
    - Implement features such as real-time sales data visualization, product performance tracking, and customer lifetime value analysis.

6. Voice Search Integration

- **Feature**: Allowing users to search for products using voice commands for a hands-free shopping experience.
- **Benefits**:
    - **Convenience**: Voice search allows users to quickly find products without typing, especially beneficial for mobile and smart device users.
    - **Innovation**: Voice search adds a modern touch to the platform and can improve accessibility for users with disabilities.
- **Implementation**:
    - Integrate voice recognition APIs like **Google Speech API** or **Amazon Lex** to enable voice-based product searches.
    - Provide a voice-enabled search bar on key pages, including the homepage, product listing, and search results.

7. Subscription Model for Products

- **Feature**: Implementing a subscription model for certain products, allowing customers to subscribe for regular deliveries at discounted rates.
- **Benefits**:
    - **Customer Retention**: Subscriptions encourage repeat purchases, fostering long-term customer relationships.
    - **Stable Revenue Stream**: Regular subscriptions create predictable revenue, reducing the dependency on one-time sales.
- **Implementation**:

- Allow customers to subscribe to consumable products like food items, beverages, or personal care products for recurring deliveries.
- Offer incentives like discounts, free shipping, or exclusive deals for customers who choose a subscription plan.

For any further doubts or help, please consider the code from the google drive,

The demo of the app is available at:

https://drive.google.com/file/d/1h83o5MQGps5zbXJEyjU-CW8hKwnBvIk8/view?usp=sharing