# FOOD ORDERNG APPLICATION

## TEAM MEMBERS:

1. **Sara K Mugdha – Front End**
2. **Sri Nandhini K – Admin**
3. **Deepika R – Backend**
4. **Pavithra Rangarajan – UI/UX**
5. **Abirami S A – Testing**

# 1) PROJECT OVERVIEW

**Purpose**

- User Interface (React): Build a responsive and user-friendly front-end interface for browsing menus, managing profiles, placing orders, and tracking order status in real time.

- Backend API (Node.js & Express): Manage business logic, handle API endpoints, authenticate users, process orders, integrate payments, and validate data efficiently.

- Database (MongoDB): Store and manage application data in a flexible, schema-less format to support dynamic and scalable data structures.

- Real-Time Features: Provide instant feedback and updates on order statuses using technologies like WebSockets for seamless real-time interactions.

- Admin Panel: Enable restaurant owners/operators to manage orders, menus, inventory, and customer feedback with ease.

- Deployment and Scaling: Deploy the application for public use and ensure it is optimized to handle real-world traffic and growth effectively.

**Goals**

- User Interface (React): Provide an intuitive, visually appealing experience across devices. Enable seamless real-time interactions without page reloads.
- Backend API (Node.js & Express): Ensure data integrity and efficient communication between the front-end and database. Build a scalable backend capable of handling high traffic and real-time updates.

- Database (MongoDB): Facilitate efficient read/write operations during high traffic periods. Support scalability and flexibility for feature enhancements.
- Real-Time Features: Enhance user engagement with live updates. Streamline communication between users, restaurants, and delivery personnel.
- Admin Panel: Improve operational efficiency for restaurant staff. Provide actionable business insights through analytics.
- Deployment and Scaling: Ensure high availability and performance during peak usage. Implement auto-scaling to manage traffic spikes effectively.

## 2)ARCHITECTURE

### Frontend Architecture (React)

Purpose: To build a dynamic, responsive, and interactive user interface using React's component-based architecture for a food ordering application.

Key Elements:

- Component-Based Structure: Reusable components like Header, Menu, Cart, OrderSummary, Login/Register, and Footer enhance modularity and maintainability.
- State Management:
  - Local State: Managed using useState for UI-specific needs.
  - Global State: Managed using Context API or Redux for cart, authentication, and order details.
- Routing: React Router handles navigation between Home, Menu, Cart, and Order Confirmation pages.
- Data Fetching: Axios with useEffect retrieves menu data, user details, and order statuses.
- Authentication: JWT-based login, with private routes for secure access.
- Real-Time Updates: WebSockets or polling for order status updates.

- Build & Deployment: Tools like Webpack, Create React App, and CI/CD pipelines ensure seamless deployment to platforms like Netlify or AWS.
- Error Handling: Error Boundaries and try/catch for robust error management.
- Testing: Jest and React Testing Library for unit and integration tests.

**Backend Architecture (Node.js & Express)**

Purpose: To manage business logic, API endpoints, and database interactions for the food ordering application.

Key Elements:

- Core Technologies: Node.js runtime and Express.js framework.
- Folder Structure: Organized into /config, /controllers, /models, /routes, and other modular directories for maintainability.
- Routing & Controllers: Routes define endpoints; controllers handle request logic and responses.
- Database Integration: MongoDB models for users, orders, reviews and menu items.
- Middleware: Functions for authentication (JWT), validation, and error handling.
- Authentication & Authorization: JWT for secure, token-based authentication.
- Error Handling: Centralized system for processing and logging errors.
- Logging: Tools like Winston or Morgan for request and error logging.
- API Documentation: Tools like Swagger for auto-generating API docs.
- Performance & Caching: Redis for caching; rate limiting for API protection.
- Testing: Jest, Mocha, and Supertest for backend validation.
- Deployment: Hosted on platforms like Heroku or AWS with Docker and NGINX for scaling.

**Database Architecture (MongoDB)**

Purpose: To store, retrieve, and manage application data efficiently using MongoDB's flexible schema-less structure.

Key Elements:

- Schema Design: Mongoose schemas enforce structure and validation for collections. Use embedding for related data (e.g., user orders) and referencing for independent updates (e.g., menu items).
- CRUD Operations: Models handle create, read, update, and delete operations.
- Indexes: Indexed fields (e.g., user email) improve query speed.
- Aggregation Framework: Advanced queries for grouping, filtering, and generating reports.
- Transactions: Ensure atomicity for multi-document operations.
- Sharding & Scaling: Distribute data across servers for horizontal scaling.
- Backup & Recovery: Automated backups and failover with MongoDB Atlas.
- Security: RBAC, encryption (at rest and in transit), and authentication mechanisms.
- Data Modeling Patterns: Embed for frequent reads; reference for normalization and flexibility.

## 3) SETUP INSTRUCTION

### I. Prerequisites

Before you begin setting up the application, make sure you have the following software installed on your machine:

- Node.js (version 14 or higher)
  Download Node.js
- MongoDB (version 4.4 or higher)

Download MongoDB

Additionally, you'll need a code editor such as Visual Studio Code to view and edit the project files.

## II. Installation

**Clone Repository:**

- Clone the repo: git clone <repository-url>
- Navigate to project directory: cd <project-directory>

**Install Dependencies:**

- Frontend (React):
  cd frontend
  npm install
- Backend (Node.js):
  cd backend
  npm install

**Set Up Environment Variables:**

- Frontend (.env):
  REACT_APP_API_URL=http://localhost:4000
- Backend (.env):
  mongodb+srv://sarakmugdha2910:sara2910@cluster0.tovm3.mongodb.net/?retryWrites=true&w=majority&appName=Cluster0l4pl.mongodb.net/e-commerce>
- PORT=5000
  JWT_SECRET=mySecretKey

**MongoDB Setup:**

- Ensure MongoDB is running locally or update .env for MongoDB Atlas.

**Run Database Migrations:**

- Follow backend README or script files for migrations.

## 4)FOLDER STRUCTURE

**Frontend (User)**

```
src/
 ├— components/      # Contains reusable UI components
 │    ├— Navbar.js    # Navigation bar for the app
 │    ├— Menu.js      # Displays the list of food items
 │    ├— Cart.js      # Manages the cart functionality
 │    ├— PlaceOrder.js # Handles the order placement process
 │    ├— PhotoReview.js # Displays user reviews with photos
 ├— context/         # Manages global state
 │    ├— CartContext.js # Centralized state for cart operations
 ├— services/        # API services
 │    ├— api.js       # Axios setup and backend API calls
 ├— pages/           # Page-level components
 │    ├— Home.js      # Homepage layout
 │    ├— AdminDashboard.js # Admin-specific functionalities
 ├— App.js           # Main component for routing and layout
 ├— index.js         # Entry point of the React app
 ├— styles/          # CSS files for styling components
 │    ├— Navbar.css
 │    ├— App.css
```

**Backend (Database)**

```
backend/
 ├——— controllers/       # Handles the business logic for routes
 │    ├——— authController.js   # Handles user authentication
 │    ├——— foodController.js   # CRUD operations for food items
 │    ├——— orderController.js  # Handles order processing
 │    ├——— reviewController.js # Manages photo reviews
 ├——— models/           # Mongoose schemas and models
```

```
│   ├──── User.js            # User model
│   ├──── FoodItem.js        # Food item model
│   ├──── Order.js           # Order model
│   ├──── Review.js          # Review model
├──── routes/           # API endpoints
│   ├──── authRoutes.js      # Routes for user authentication
│   ├──── foodRoutes.js      # Routes for food items
│   ├──── orderRoutes.js     # Routes for orders
│   ├──── reviewRoutes.js    # Routes for reviews
├──── middleware/       # Custom middleware
│   ├──── authMiddleware.js  # Authenticates user and admin tokens
├──── config/           # Configuration files
│   ├──── db.js              # MongoDB connection setup
│   ├──── dotenv.config      # Environment variables setup
├──── server.js         # Entry point for the backend server
├──── package.json      # Project dependencies and scripts
```

**Admin**

```
src/
├── admin/              # Admin-specific components and pages
│   ├── AdminDashboard.js  # Main dashboard displaying statistics
│   ├── ManageItems.js     # CRUD operations for food items
│   ├── ManageOrders.js    # View and update orders
│   ├── ManageReviews.js   # Approve/reject photo reviews
├── components/         # Shared components
│   ├── Navbar.js          # Admin-specific navigation bar
│   ├── Sidebar.js         # Sidebar for admin navigation
├── context/            # Global state for admin
│   ├── AdminContext.js    # Centralized state management for admin
├── services/           # API services for admin
```

```
│   ├── adminApi.js      # API calls for admin actions
├── pages/               # Admin entry point
│   ├── AdminLogin.js    # Admin login page
│   ├── AdminDashboard.js # Main page for admin workflows
├── App.js               # Routes and main app entry
├── styles/              # CSS files for admin UI
│   ├── AdminDashboard.css
│   ├── ManageItems.css
```

## 5) RUNNING THE APPLICATION

To run the application locally, you'll need to start both the frontend and backend servers. Follow the commands below to launch each part of the application:

**Frontend**

1. Navigate to the client directory:

   cd frontend

2. Start the React development server:

   npm run dev

This will run the frontend application on http://localhost:5173

**Backend (Node.js)**

1. Navigate to the server directory:

   cd backend

2. Start the Node.js server:

   Npm run server

This will run the backend server on http://localhost:4000

**Admin**

1. Navigate to the server directory:

cd admin

2. Start the Node.js server:

npm run dev

This will run the backend server on http://localhost:5174

## 6) API DOCUMENTATION

### Sign Up:

Request Body (json):

```
{
 "name": "John Doe",
 "email": "john.doe@example.com",
 "password": "password123"
}
```

Response Body:

```
{
  "message": "User registered successfully",
  "user": {
    "id": "user_id",
    "name": "John Doe",
    "email": "john.doe@example.com"
  }
}
```

### User Login:

Request Body (json):

```
{
 "email": "john.doe@example.com",
 "password": "password123"
}
```

Response Body:

```
{
  "message": "Login successful",
  "token": "jwt_token_here"
}
```

**Adding new food item:**

Request Body (json):

```
{
  "name": "Cheese Burger",
  "description": "A delicious cheese burger with lettuce, tomato, and special sauce",
  "price": 8.99,
  "image": "cheeseburger.jpg",
  "category": "Burgers"
}
```

Response Body :

```
{
  "message": "Food item added successfully",
  "menuItem": {
    "id": "menu_item_id",
    "name": "Cheese Burger",
    "description": "A delicious cheese burger with lettuce, tomato, and special sauce",
    "price": 8.99,
    "image": "cheeseburger.jpg",
    "category": "Burgers",
  }
}
```

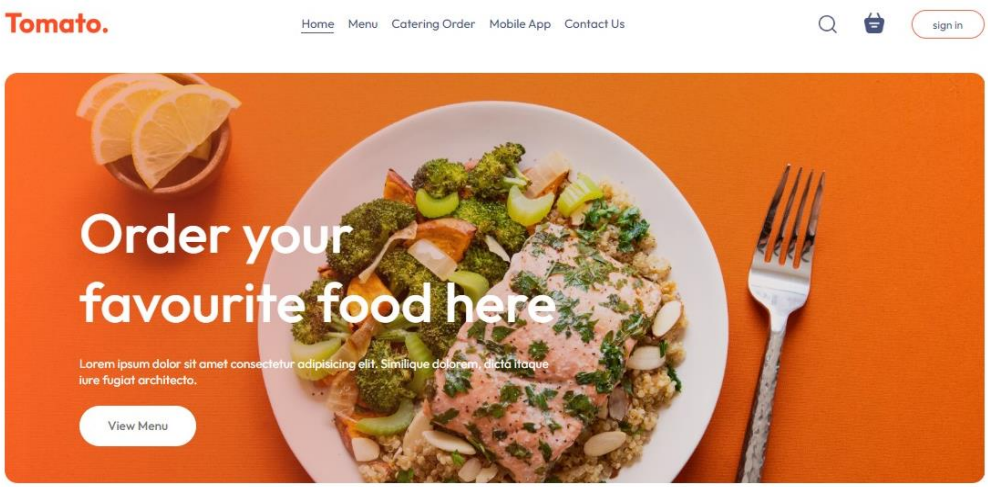
## 7) AUTHENTICATION

In this App, authentication is implemented using JWT (JSON Web Token) to secure the endpoints.

- Registration: Users register with their name, email, and password. Passwords are hashed before storing in the database.
- Login: Users log in with their email and password. Upon successful authentication, a JWT token is generated and returned.
- Token-Based Access: The client stores the token (usually in localStorage or sessionStorage) and includes it in the Authorization header for protected requests.
- Password Hashing: Hashing passwords before storing them in the database (using bcrypt).

## 8) USER INTERFACE

**Home Page:** Displays all available food items with search and category filter options.



## Explore Our Menu

Choose a diverse menu featuring a delectable array of dishes. Our mission is to satisfy your cravings and elevate your dining experience, one delicious meal at a time.


Salad


Rolls


Deserts


Sandwich

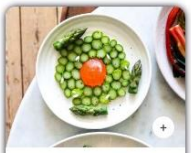

Cake


Pure Veg

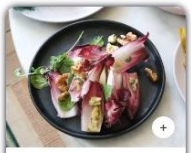

Pasta

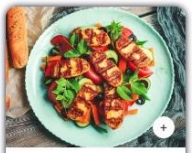

Noodles

## Top dishes near you


Greek salad

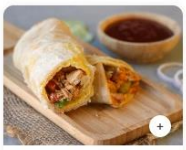

Veg salad


Clover Salad


Chicken Salad


Lasagna Rolls


Peri Peri Rolls

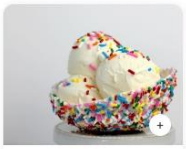

Chicken Rolls

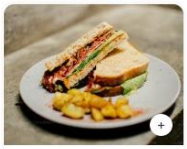

Veg Rolls


Ripple Ice Cream

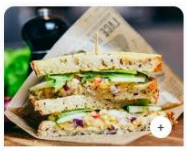

Fruit Ice Cream


Jar Ice Cream

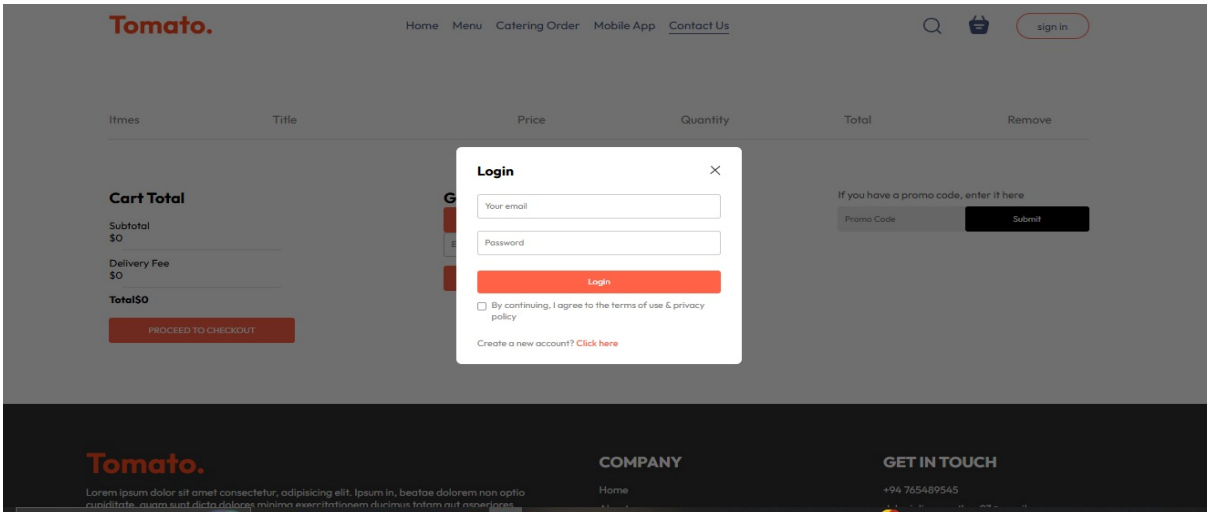

Vanilla Ice Cream

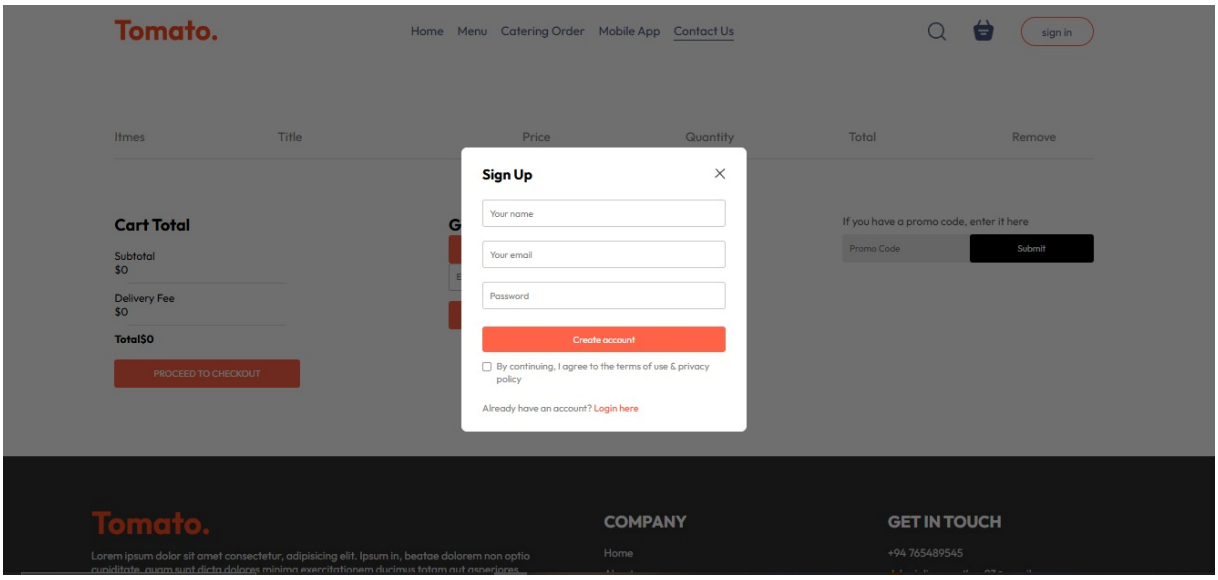

Chicken Sandwich


Vegan Sandwich

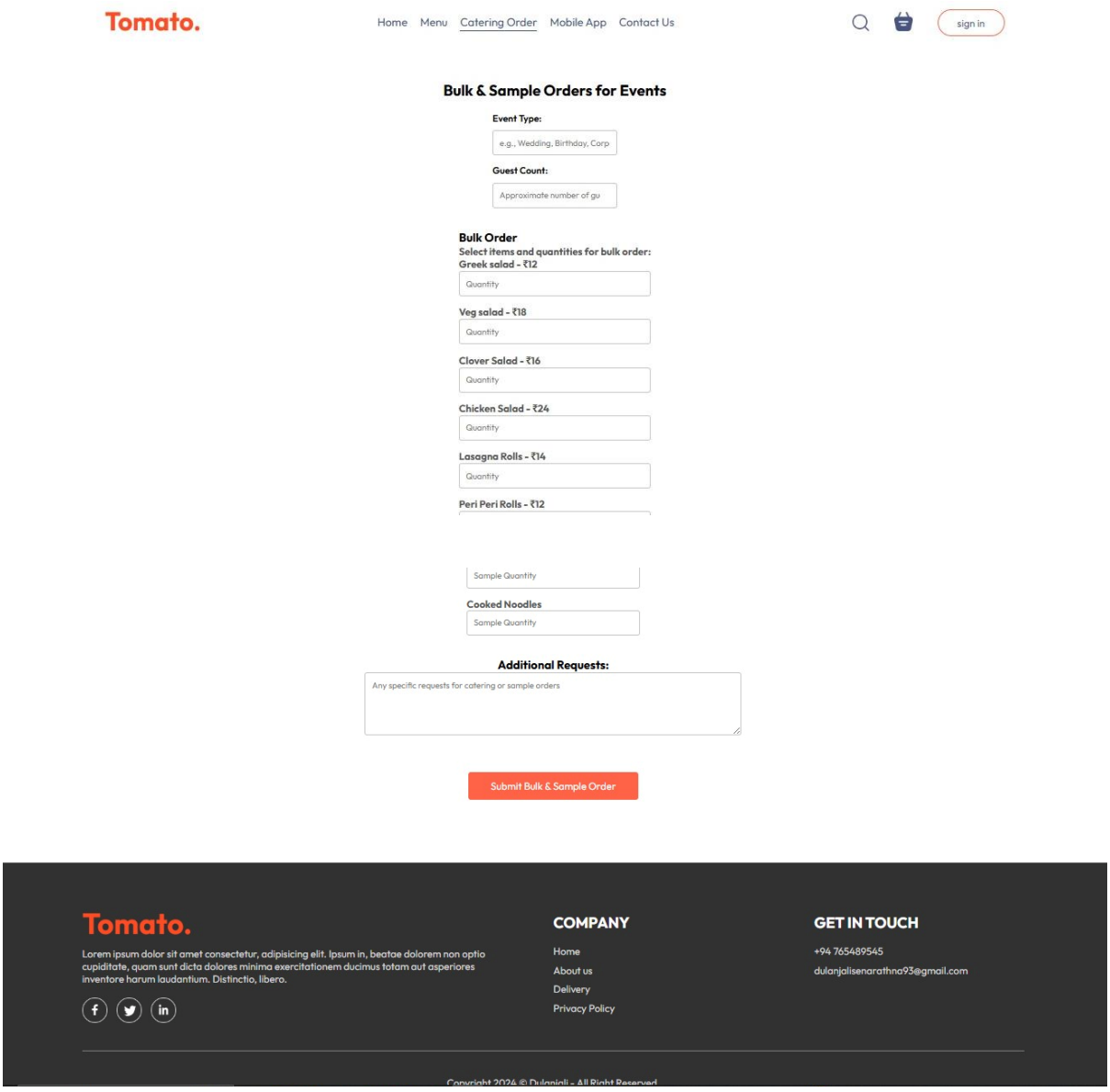

Grilled Sandwich

**<u>Login/Sign Up:</u>** Here new users can register themselves and already registered users can login

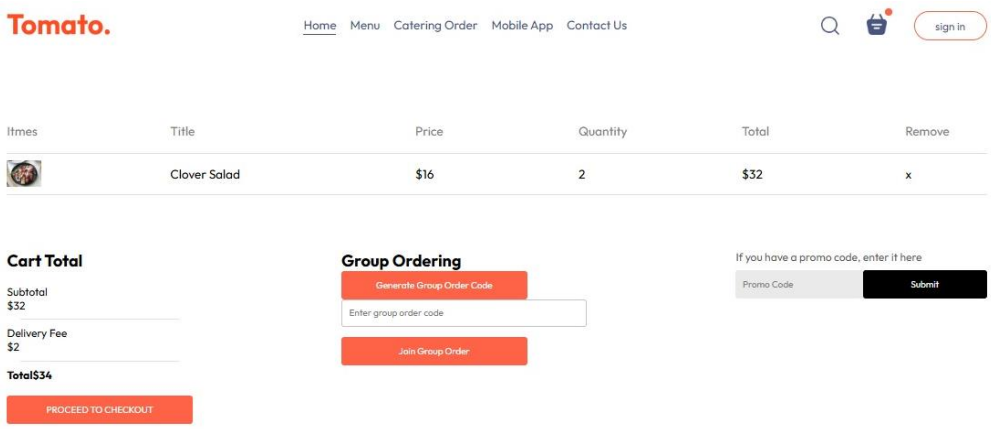


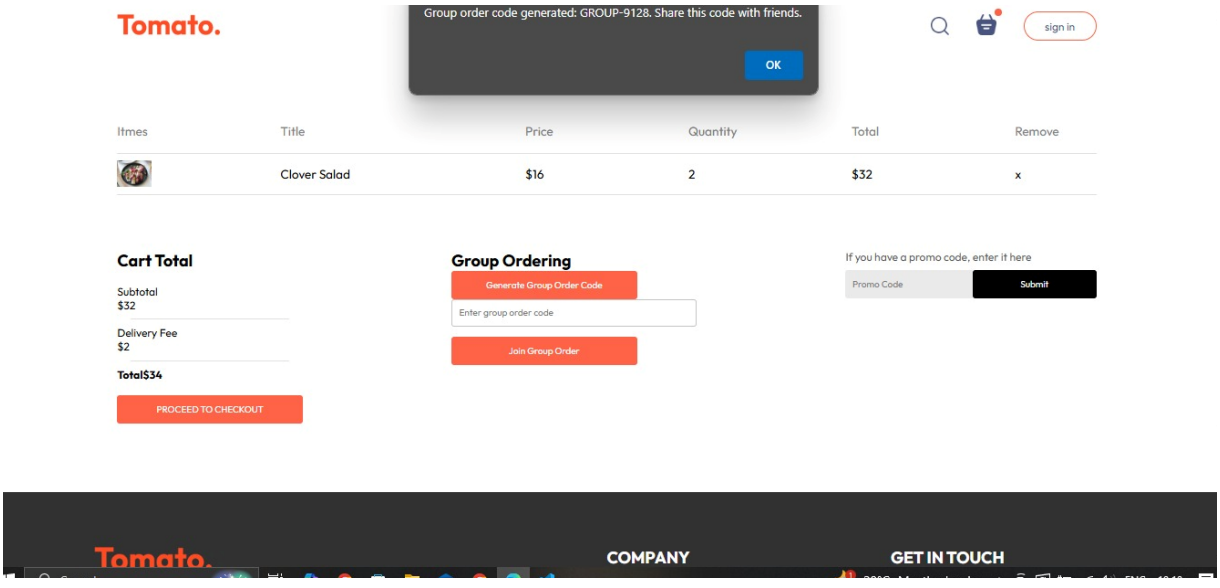
**<u>Catering Order Page:</u>** Here the users can give a bulk order and order food for events with specific favorable foods.

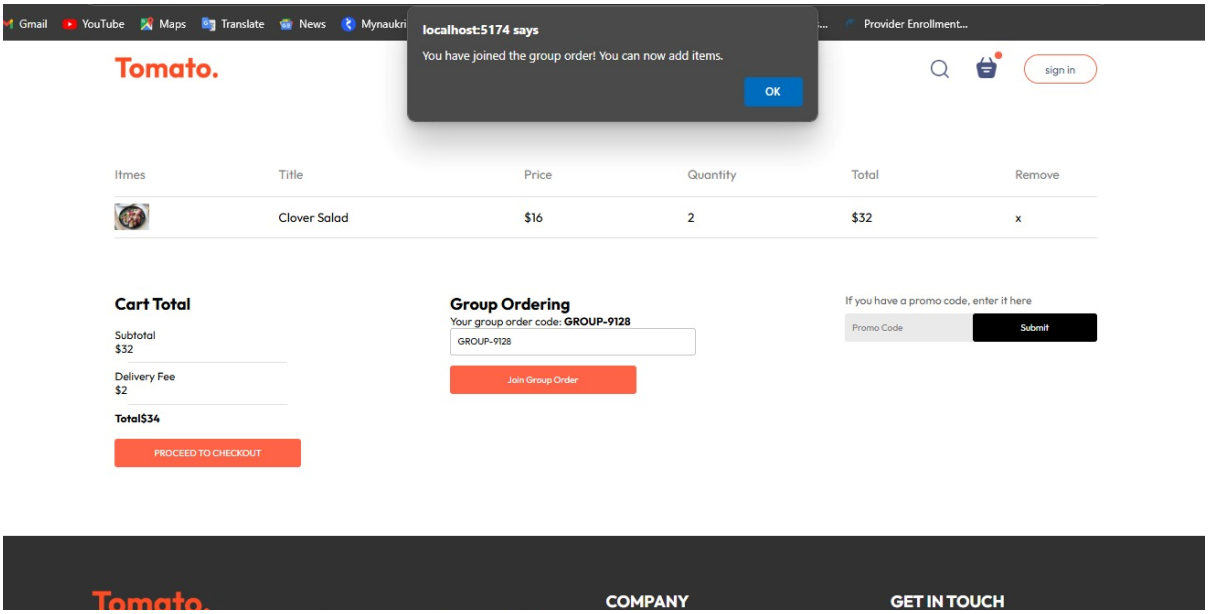


**Cart Page:** It would display the products under cart with quantity and price breakdown with group ordering feature.

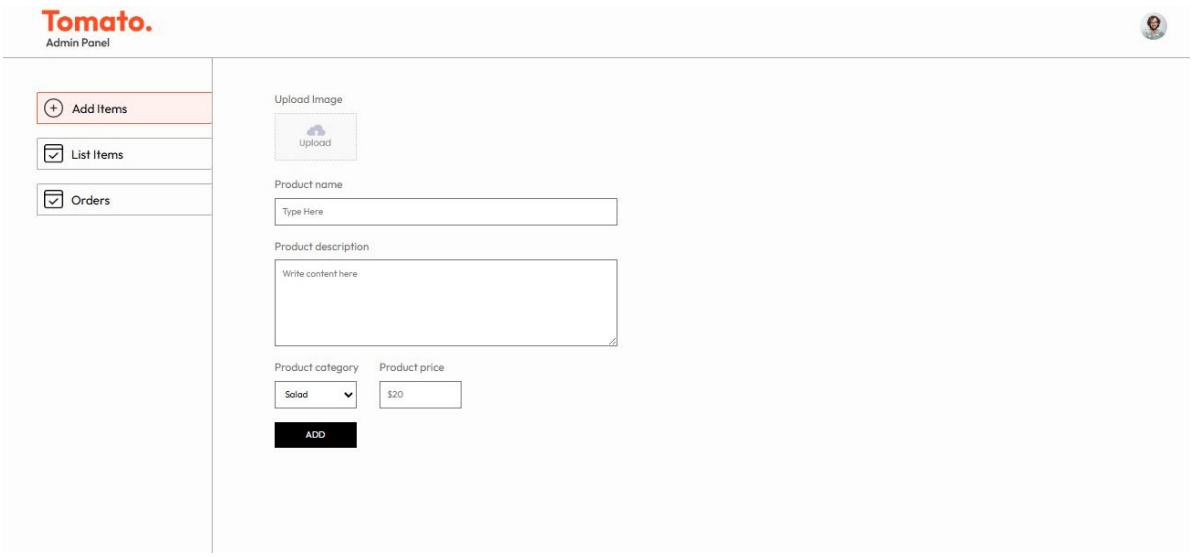


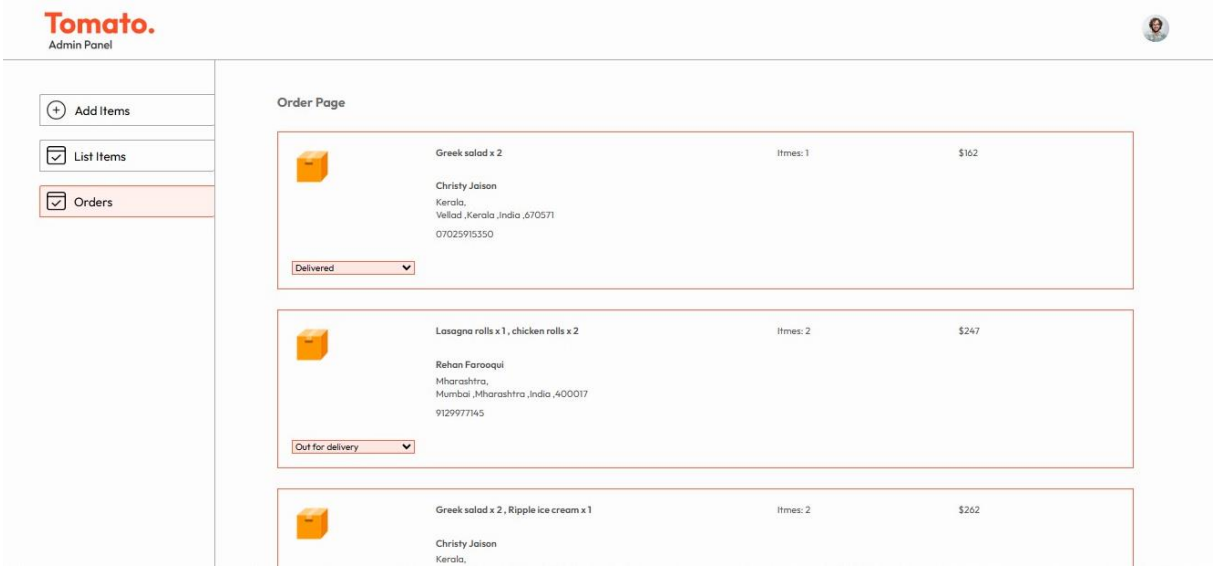

**Place Order Page:** It would display the products under cart with quantity and price breakdown and also the address and price details.

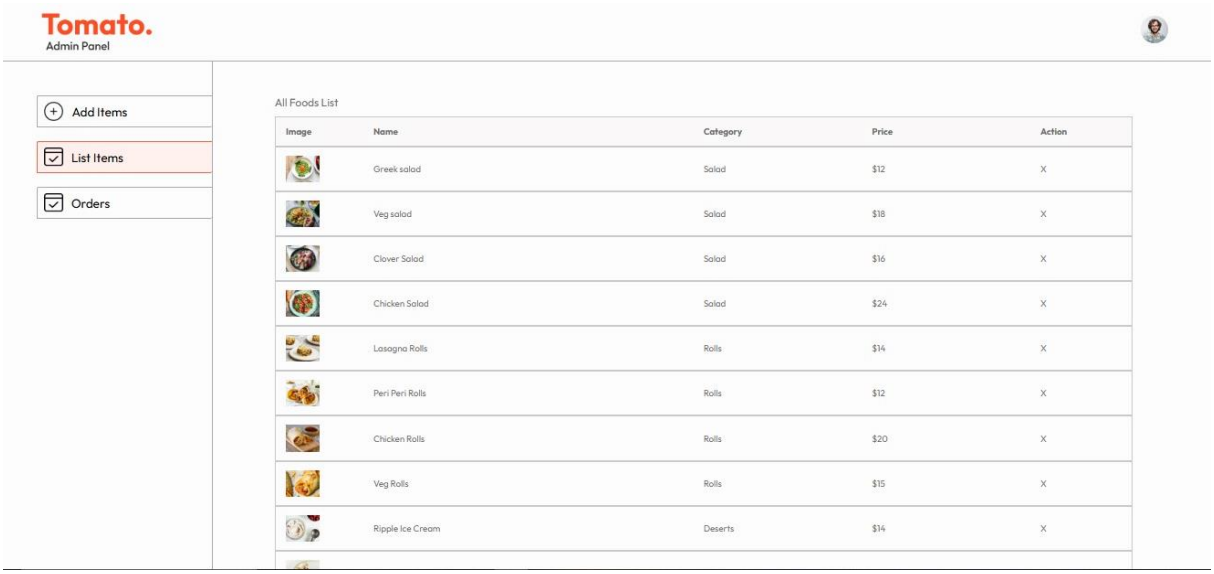





**Admin Page:** Here the admin can add, remove and view new food items in the menu and also track and view users' orders.






# 9) TESTING

**Tools and Frameworks**

Frontend Testing

- Jest: A testing framework for JavaScript, often used with React.
- React Testing Library: Used for testing React components and their interactions.

Backend Testing

- Mocha: A flexible testing framework for Node.js.
- Chai: An assertion library used with Mocha for readable test cases.
- Supertest: Used for testing HTTP requests to your Express APIs.

End-to-End Testing

- Cypress: For testing user workflows in the browser.
- Postman/Newman: For testing and automating API endpoints.

**Test Cases**

Frontend Test Cases

1. Component Tests:
    - Verify that the Navbar renders correctly with navigation links.
    - Ensure that the Cart component displays the correct number of items.
    - Check that Home page fetches and displays restaurant data.

        cd frontend

        npm test
2. Form Validation:
    - Test form inputs for login and registration (e.g., invalid emails, missing fields).

Backend Test Cases

1. API Endpoint Tests:
    - Verify /api/users registers a new user.
    - Test /api/auth/login for valid and invalid credentials.

        cd backend

        npm test
2. Database Tests:
    - Ensure Mongoose models validate schema correctly.

End-to-End Test Cases

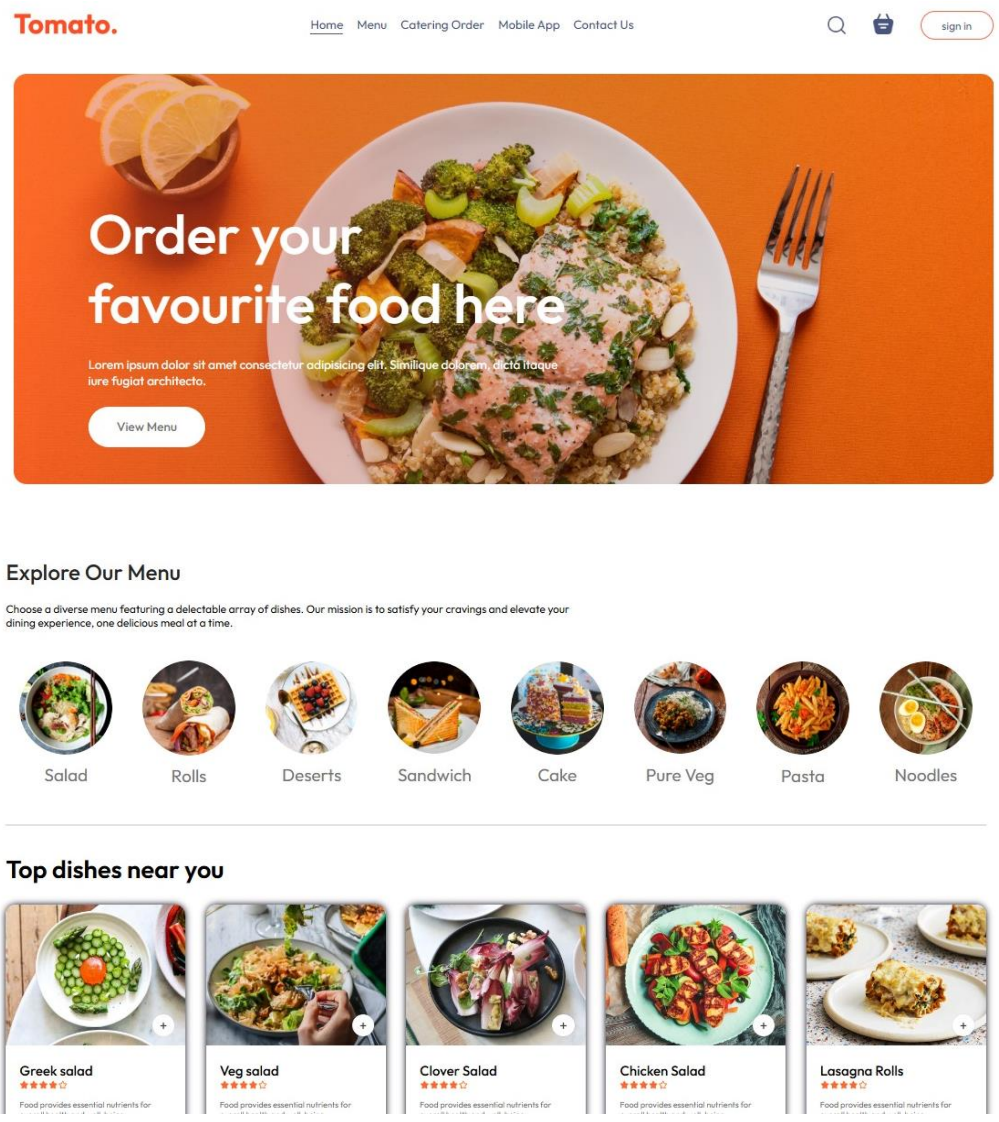
1. User Workflow:
    - Simulate a user registering, logging in, adding items to the cart, and placing an order.
    - Use Cypress to verify UI elements and flows.

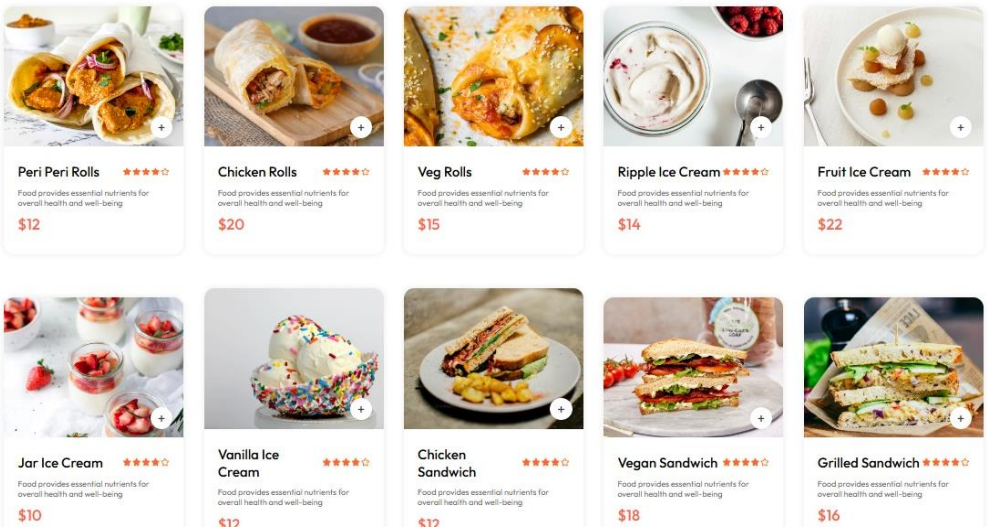
        npx cypress open

# 10) SCREENSHOTS

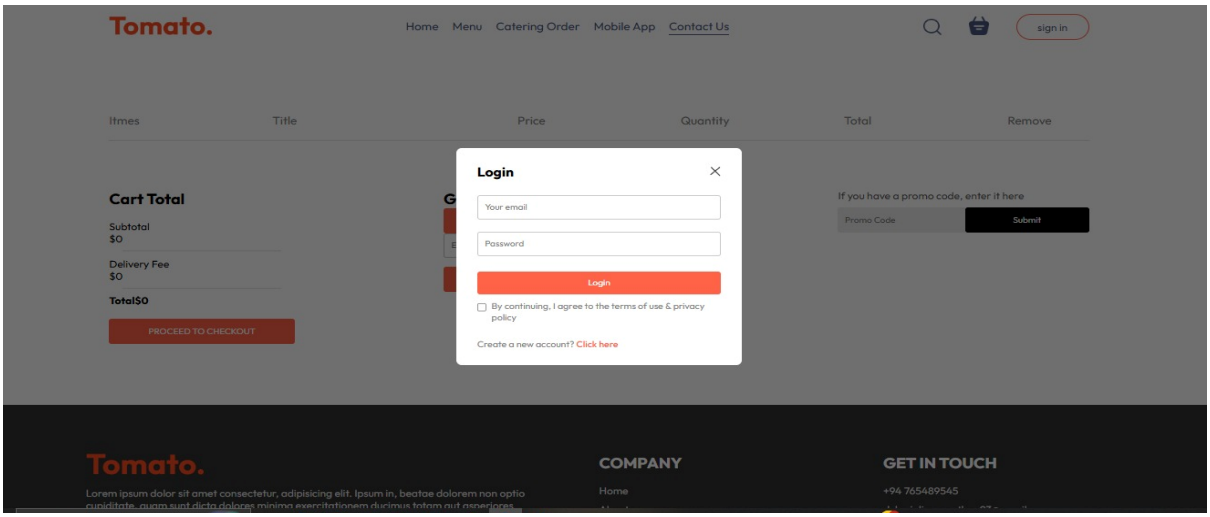
## Frontend Screenshots:

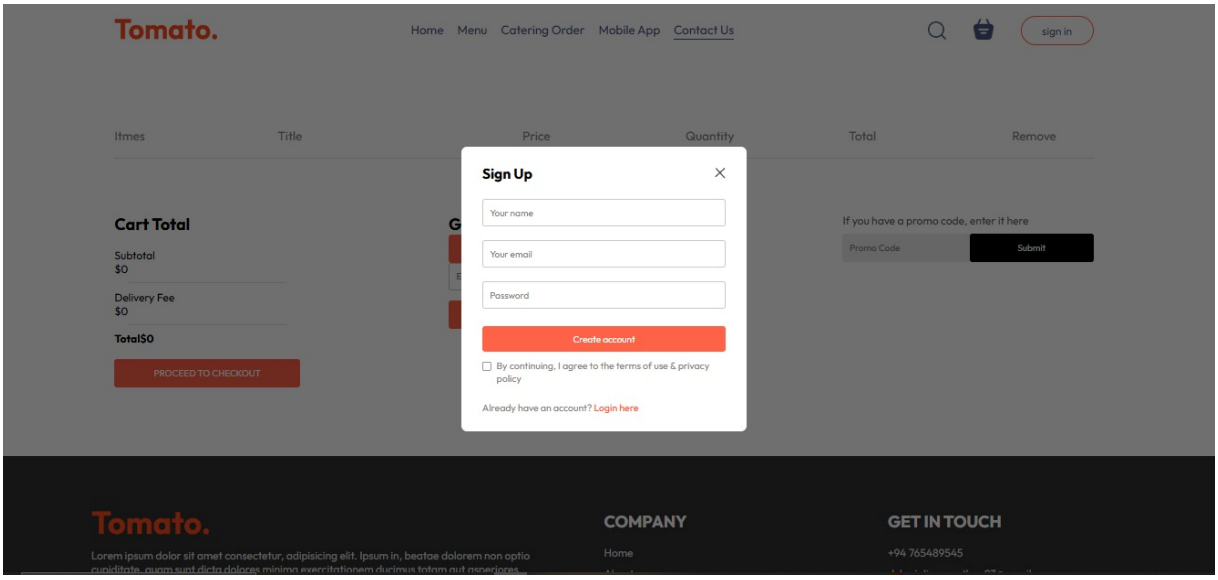
Home Page



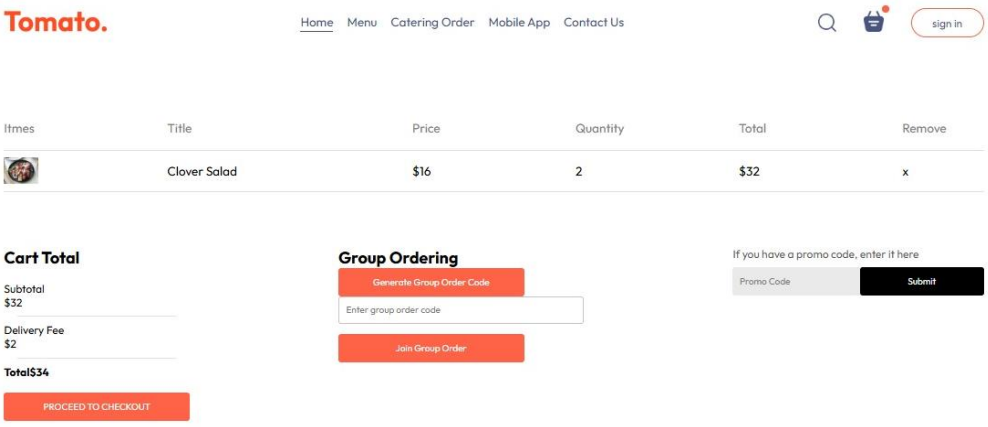



Login/Sign Up:

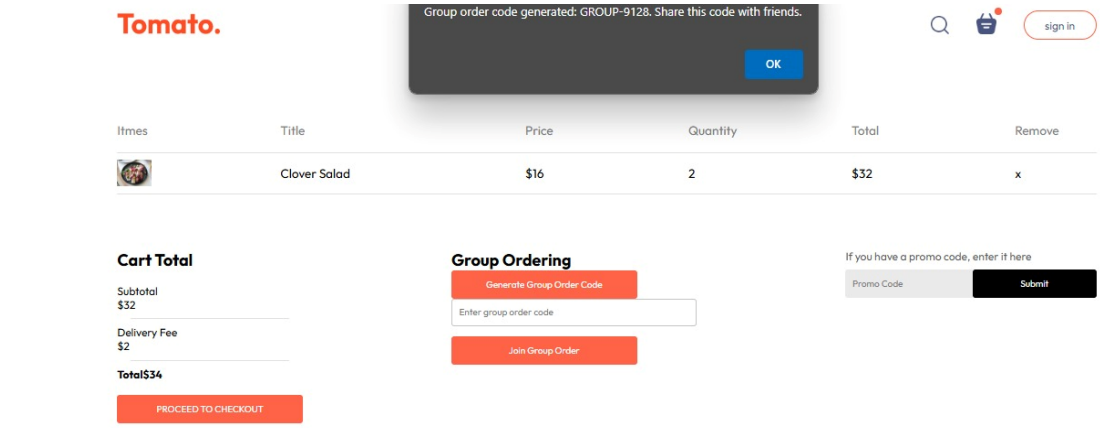


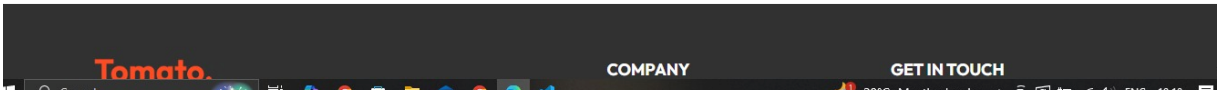

Tomato.
Home Menu Catering Order Mobile App Contact Us
sign in
Itmes Title Price Quantity Total Remove
Cart Total
Subtotal
$0
Delivery Fee
$0
Total$0
PROCEED TO CHECKOUT
Sign Up
Your name
Your email
Password
Create account
By continuing, I agree to the terms of use & privacy policy
Already have an account? Login here
If you have a promo code, enter it here
Promo Code
Submit
Tomato.
COMPANY
Home
GET IN TOUCH
+94 765489545

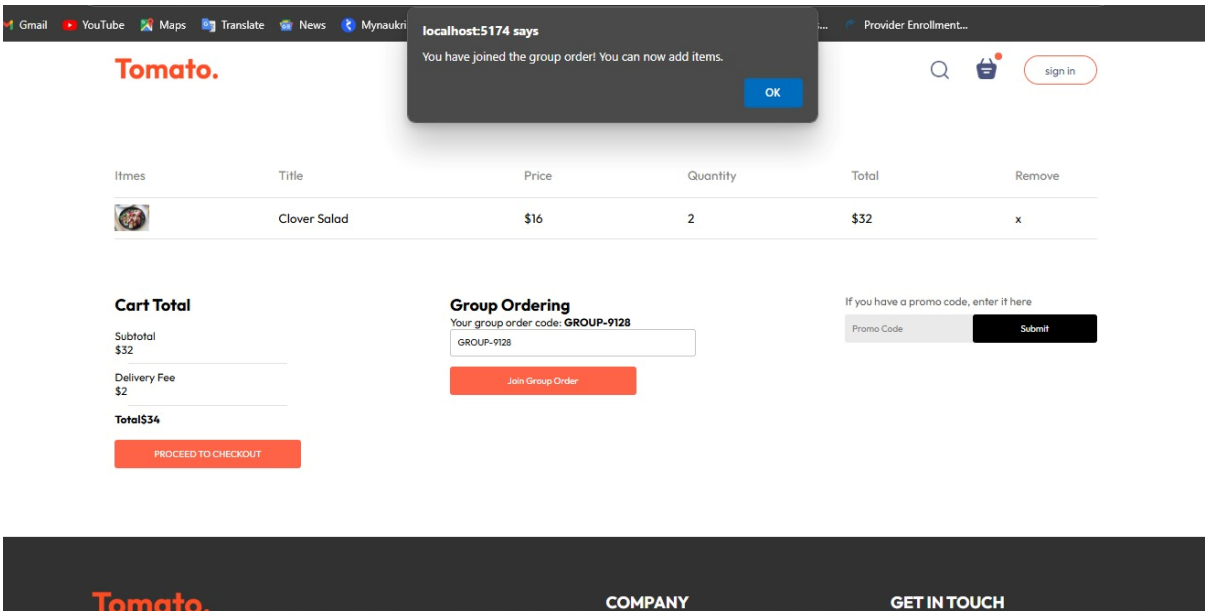
Cart Page:


Tomato.
Home Menu Catering Order Mobile App Contact Us
sign in
Itmes Title Price Quantity Total Remove
Clover Salad $16 2 $32 x
Cart Total
Subtotal
$32
Delivery Fee
$2
Total$34
PROCEED TO CHECKOUT
Group Ordering
Generate Group Order Code
Enter group order code
Join Group Order
If you have a promo code, enter it here
Promo Code
Submit

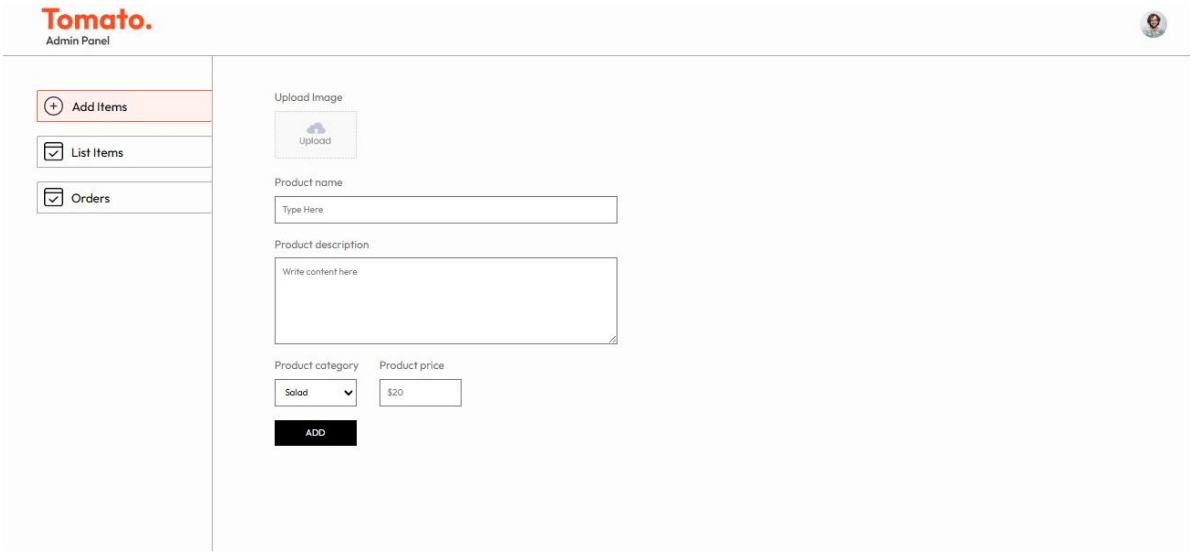
Place Order Page:

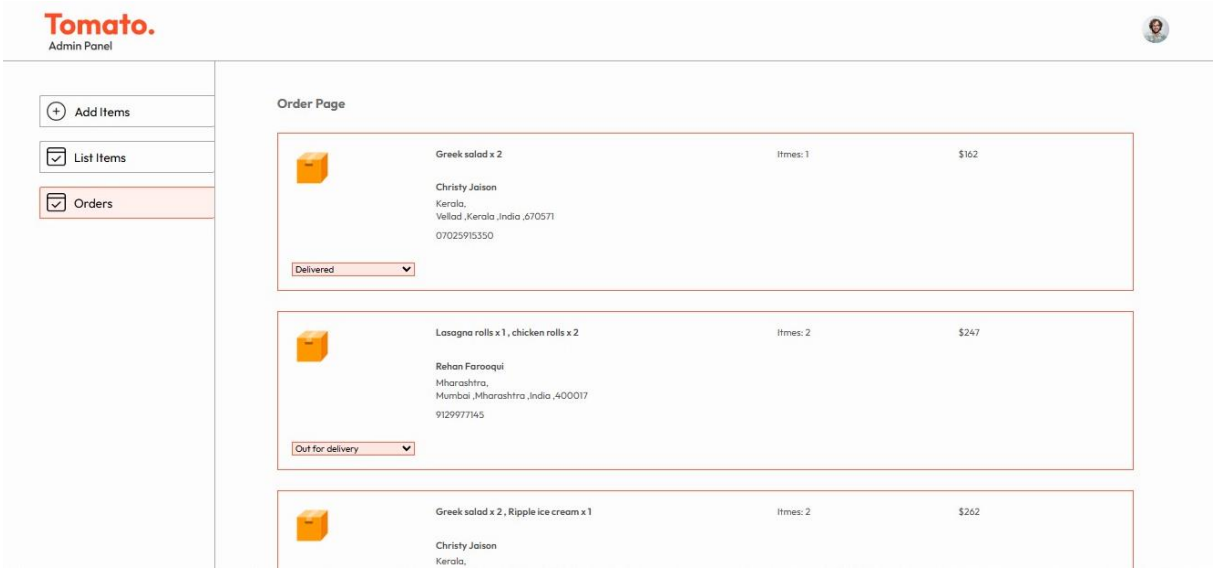


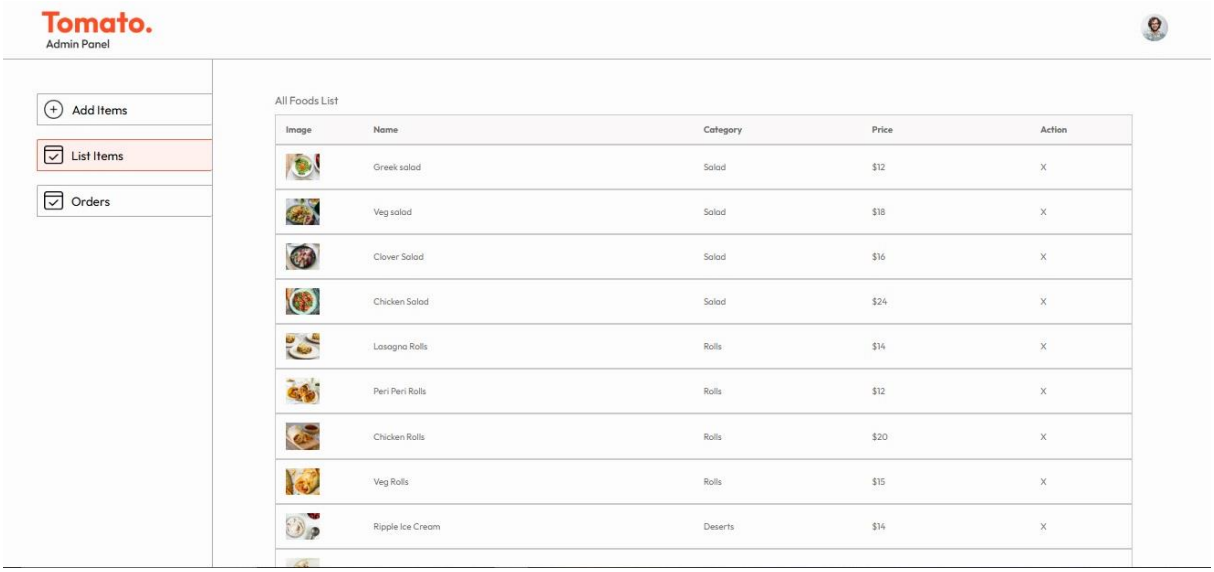



# Admin Page


Tomato.
Admin Panel
Add Items
List Items
Orders
Upload Image
Upload
Product name
Type Here
Product description
Write content here
Product category
Salad
Product price
$20
ADD


Tomato.
Admin Panel
Add Items
List Items
Orders
Order Page
Greek salad x 2
Items: 1
$162
Christy Jaison
Kerala,
Vellad ,Kerala ,India ,670571
07025915350
Delivered
Lasagna rolls x 1 , chicken rolls x 2
Items: 2
$247
Rehan Farooqui
Mharashtra,
Mumbai ,Mharashtra ,India ,400017
9129977145
Out for delivery
Greek salad x 2 , Ripple ice cream x 1
Items: 2
$262
Christy Jaison
Kerala,




## 11) KNOWN ISSUES

- Performance: Slow response times for API requests since Database queries not optimized or unnecessary re-renders in the frontend.
- Deployment: Environment variables or configurations are exposed in the deployment.
- JWT Token Expiry Handling: Expired tokens not detected, causing authorization errors.

## 12) FUTURE ENHANCEMENTS

- Notifications: Add email and push notifications to notify users of order confirmations, status changes, and promotional offers.
- Multi-Tenant Support: Support multiple restaurant owners with separate dashboards which allows each restaurant to manage their menu, orders, and analytics independently.
- Restaurant Analytics: Provide analytics for restaurants which show metrics like sales trends, popular dishes, and peak order times.
- Dynamic Pricing: Enable dynamic pricing for restaurants which will allow restaurants to offer discounts during off-peak hours or surge pricing during busy periods