ONLINE RESTAURANT ORDERING AND MANAGEMENT SYSTEM

CSE3002-Internet and Web Programming

In

Fall 2020-2021

By

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Under the guidance of

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VIT®

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

CERTIFICATE

This is to certify that the project work entitled ***“Online Restaurant ordering and Management System”*** that is being submitted by ***“Saloni Anand (18BCE2276), Divyang Arora (18BCE2251), and Kartavya Asthana (18BCI0026)”*** for Internet and Web Programming (CSE3002) is a record of bonafide work done under my supervision. The contents of this Project work, in full or in parts, have neither been taken from any other source nor have been submitted for any other CAL course.

Date: 25th October, 2020

Signature of Student:

Saloni Anand

Divyang Arora

Kartavya Asthana

Signature of Faculty:

Prof. Raguntthar.T.

ACKNOWLEDGEMENTS

We take immense pleasure in thanking **Dr. G. Viswanathan**, our beloved Chancellor, VIT University and respected Dean, **Dr. R. Saravanan**, for having permitted us to carry out the project.

We express gratitude to our guide, **Dr. T. Ragunthar**, for guidance and suggestions that helped us to complete the project on time. Words are inadequate to express our gratitude to the faculty and staff members who encouraged and supported us during the project. Finally, we would like to thank our ever-loving parents for their blessings and our friends for their timely help and support.

Signature of Students:

Saloni Anand:

Divyang Arora:

Kartavya Asthana

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1. Abstract

Restaurant is the kind of business that serves people all over the world through ready made foods. Usually when we go to restaurants we see the employees or the waiters who come near the tables of the customers to ask for their orders. Due to some misunderstanding by the employees there might be a chance of getting a dish that was not ordered. Sometimes when there is a rush in the restaurants there is a chance of customers going back due to the unavailability of the tables even if they are present in some or the other corner. To solve all these problems, this restaurant management project can be useful. This restaurant management project will help in managing the day to day activities of the restaurant easily. The employees will be able to manage the orders placed by the customers through this system since the priority can be given to the orders that have been placed first according to the record. The list of food items and the beverage list can be maintained in the database. Also, the employees will be able to locate any empty table that is present in the restaurant.

Apart from providing food facilities in the restaurant, there is also a facility where the food can be ordered online and it will be delivered to their homes directly on time. The customer record can also be maintained in this system.

This website plays a major role in connecting the customers and service providers. In our case, the service provider is the restaurant. Customers are provided with the best services as they are allowed to order food at their own feasible situation.

An additional feature incorporated in our project is the table reservation functionality. The user can also book a table at the restaurant according to their suitable time and number of people by checking the availability and vacancy.

This system minimizes the unnecessary time taken to go all the way to the physical location of the restaurant and increases convenience for the everyone involved. Our project aims to help customers order online and reserve a table according to their desires by delivering the above mentioned facilities. With this system, we are endeavouring to achieve easy ordering and reservation from home itself.

2. Introduction

a. Problem Statement

To build a restaurant management system with the help of which employees will be able to manage the orders placed by the customers. The list of food items and the beverage list will be maintained in this database. Further, the employees will be able to locate any empty table that is present in the restaurant. Apart from providing food facilities in the restaurant, food can be ordered online and it will be delivered to their homes directly on time.

b. Technical Specifications

- Node.js: Node.js is a server side scripting language which is used for programming the back end of our Restaurant Management System. It is an asynchronous scripting language which is based on javascript and built on Google Chrome's JavaScript runtime for easily building fast and scalable network applications. Node.js is light-weight and efficient as it uses a non-blocking, event-driven I/O model. It is well suited for applications that run on a cluster of distributed devices and real-time data-intensive applications.

Node.js packages used:

- Express: There are many web application development frameworks available. One such framework is express. It is a flexible and minimal Node.js web application development framework. It provides a robust set of features to develop mobile and web apps. Node based web applications can be developed rapidly using express.

- EJS: One of the templating engines used by Node.js is eJS. It stands for embedded Javascript Templating. A templating engine has two main functions- helps by providing the ability to use minimal code to create an HTML template and produce the final HTML code by dynamically injecting data into the HTML template at the client side. In our project, it is used for sending data from the backend (server) and accessing it in the front-end (client’s browser). For example, it is used for displaying the menu which is fetched from the Database.

- Mongoose: Mongoose is an ODM (Object Data Modeling) library for Node.js and MongoDB. Mongoose translates between the code objects and how these objects are represented in the database by providing schema validation and managing relationships between data. Mongoose also simplifies mongoDB commands and makes it developer friendly.

- Nodemailer: Nodemailer is a package used for sending mails with ease. It is licensed under the MIT license. Nodemailer is used for sending mails to users upon sign up and upon newsletter subscription.

- Cookie-parser: Cookies have various functionalities. They can be used for maintaining sessions and adding user-specific features in web apps. For parsing these cookies, a module called cookie-parser from npm acts as the middleware.

- Express-session: express-session is the package used for creating and maintaining sessions in Node.js. In our project, sessions are used to enable users to login and enable certain functionalities like placing an order or reserving a table only after login.

- Nodemon: When any changes are made in the file, it can be automatically detected by nodemon. Nodemon makes node.js app development easier by automatically restarting the server when these changes are detected. Nodemon is a replacement wrapper for node. To use nodemon replace the word node on the command line when executing your script with nodemon. It can be used when the developer does not want to keep restarting the server whenever he makes a change in the code.

- MongoDB: MongoDB is a noSQL database which is based on documents and collections. It makes handling data in the database easier than using SQL. MongoDB Compass is a user interface for MongoDB. In our project, MongoDB is used as the database for storing the user details, orders, menu etc.

Front End Development Languages -

- HTML: HTML stands for Hypertext Markup Language. It is used for structuring the webpage and add content.

- CSS: CSS stands for Cascading Style Sheets. It is used to style the HTML pages by avoiding cluttered styling attributes within HTML codes.

- JavaScript: It is a client side scripting language used to perform arithmetic, logical and many more operations on the clients browser. Using DOM, HTML elements can be accessed in JavaScript and can be changed dynamically. Without javascript, web pages cannot be dynamic. In our project, javascript is used for form validation, displaying the users name on the top right corner when he/she is logged in, to display items in cart, to display order history, to trigger events onclick etc.

- VisualStudio Code: It is a text editor which was used in our project to develop the entire application. It supports HTML, CSS, JavaScript, Node.js etc.

- Google Chrome: Google Chrome is the web browser used for displaying the web pages. Chrome’s developer tools is an inbuilt tools in chrome which can be used for debugging and editing. Live editing of the code is possible with developer tools. It also allows mobile view for developers to see and edit the way web pages look in mobile phones and Tablets.

- Git: Git is an open source version control software. It helps in keeping track of the changes made in each version. If the developer wants to roll back to the previous version, i.e, remove all the recent changes that he made, he can do it with just a command on git. This information can also be stored on GitHub which is a version control application on the web.

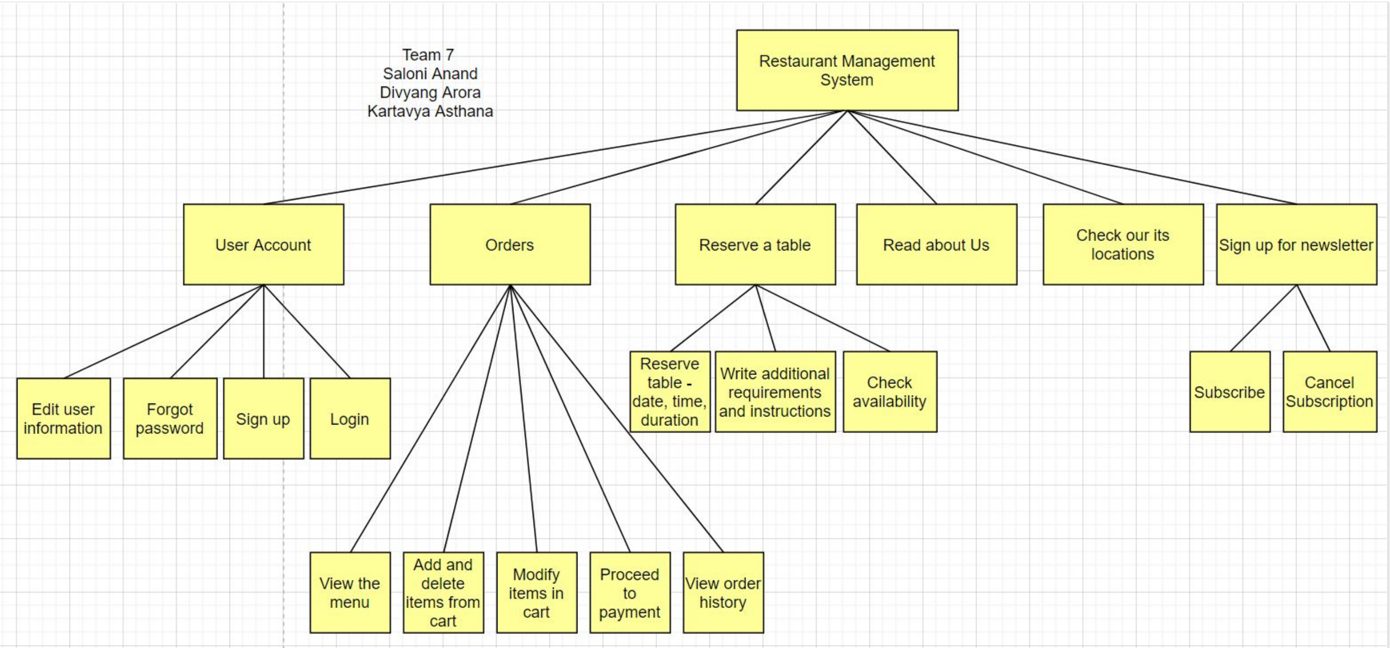
3. Existing System Problems

In this fast-changing tech landscape, when more and more diners are migrating online, restaurants have realized that if they fail to provide a robust, seamless and efficient online ordering platform, they will quickly be left out of the race.

- There does not exist a common place where customers can book tables at a restaurant as well as order food as per their convenience.
- Sometimes in peak hours, there exists a misunderstanding in taking orders from the waiter’s end which results in customers not getting what they had ordered for.
- Customers often end up waiting for hours in queues as they are not aware of the rush and unavailability of tables.
- A loss of control over third-party service. Once an order leaves the restaurant by a third party app like UberEats, they lose control over the experience. However, customers will still blame them if something goes wrong. Our system provides an in-house online ordering system and hence the control is not lost. It ensures clear and concise communication.

It is possible to overcome the challenges of digital ordering for restaurants by gaining increased control over your online ordering capabilities and maximizing efficiency through integration between platforms.

4. Module description



Our project – Online Restaurant Management and Ordering can efficiently handle and manage various activities of a restaurant under the supervision of the administrator. As the businesses in restaurants are growing constantly, the technology also needs to upgrade. Hence, this project will help the restaurant owners to automate their business operations.

The **Homepage** contains general information about the restaurant, **About Us** contains details and history of the restaurant, and **Locations** contains the details about the branches of the restaurant.

User Account – The user will have to first login or sign up to add products to the cart and place the order.

To avail all the features of the website, the customer has to sign up which is a simple two minute process. Signing up is made mandatory to avoid fake orders.To Sign up – only after the validations of email and password, the user will be allowed to create a new account. The user can subscribe for newsletters and coupons on logging in.

Login - is done easily by putting in the username and password.

The customer can also edit his profile details like name, address, password, number etc.

The user can also click on ‘Forgot Password’ which will send the user an email on the registered mail id with the existing password.

Menu – users can see the menu and choose what they would like to eat/order from the list of sumptuous food items belonging to 5 categories- Soups & Salads, Appetizers, Main course, Beverages, and Desserts along with a description of each item.

The user can add items to the cart from this list only after logging in. The cart will show the total number of items and the total amount.

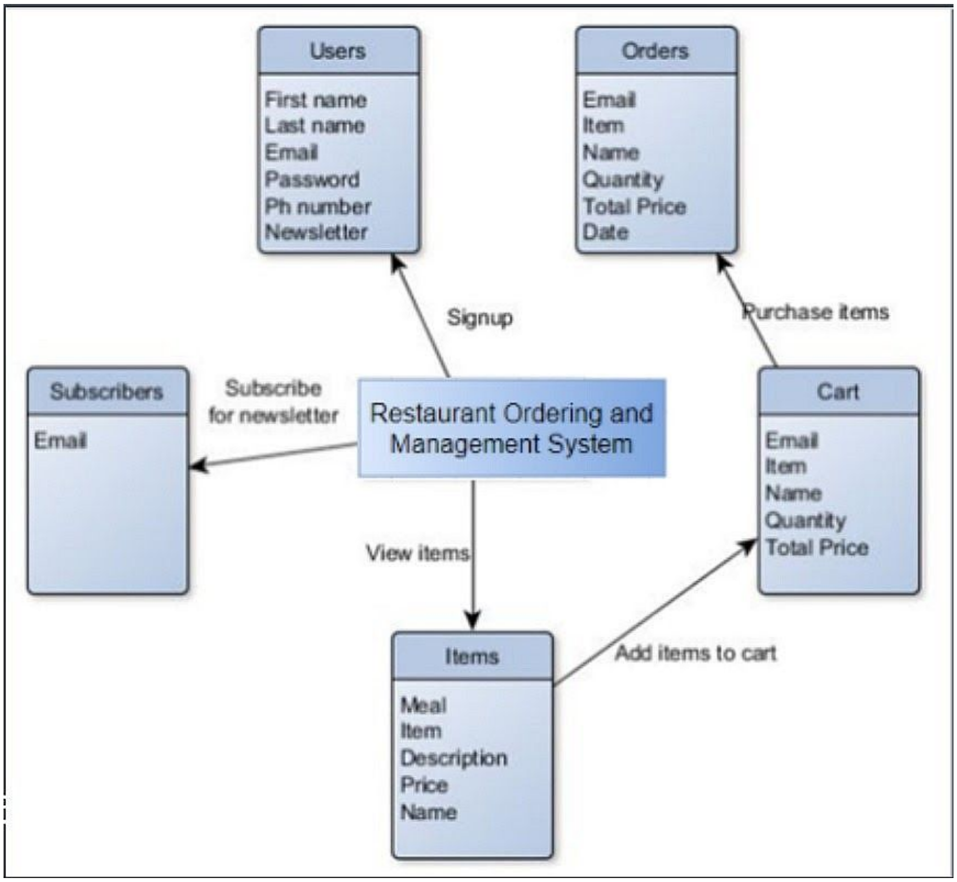
These items can also be deleted from the cart making it easy for the customer to place an order with just a few clicks. After adding items to the cart, the customer can proceed to add the information like the Delivery address – name, number, pincode, house number, locality, city.

Then the user will move to the payment process (Payment by – credit, debit, UPI, netbanking) after the completion of which the items will be removed from the cart and then can be viewed in the order history. After the completion of this process, the user is alerted with a message which says order is successfully placed.

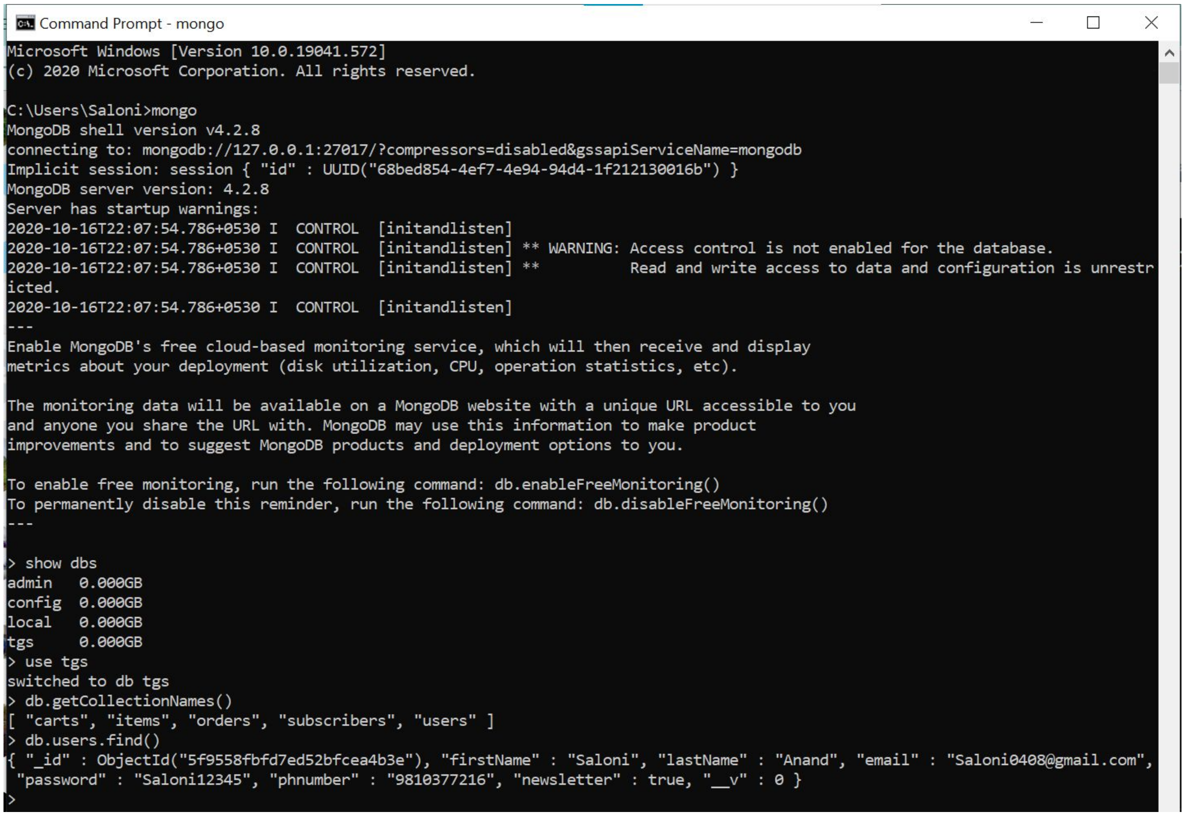
Various branches of our restaurant can be seen on the 'Location’ tab so the loyal users can have the tasty food no matter which city they are in - Chennai, Vellore, Mumbai, Delhi, Bangalore, Hyderabad.

For peak lunch/dinner timings or during festive seasons, the chances for the restaurant to be full is high. So, the user can reserve the table in advance by putting in information like city, time, and any other additional requirements or instructions.

5. Proposed System Design



We have used MongoDB for maintaining the database for our project. MongoDB is a noSQL database which is based on documents and collections. It makes handling data in the database easier than using SQL. MongoDB Compass is a user interface for MongoDB. Mongoose is a Node.js framework used for handling MongoDB commands in an easier way. The schema can be standardized using mongoose



```
Microsoft Windows [Version 10.0.19041.572]
(c) 2020 Microsoft Corporation. All rights reserved.

C:\Users\Saloni>mongo
MongoDB shell version v4.2.8
connecting to: mongodb://127.0.0.1:27017/?compressors=disabled&gssapiServiceName=mongodb
Implicit session: session { "id" : UUID("68bed854-4ef7-4e94-94d4-1f212130016b") }
MongoDB server version: 4.2.8
Server has startup warnings:
2020-10-16T22:07:54.786+0530 I  CONTROL  [initandlisten]
2020-10-16T22:07:54.786+0530 I  CONTROL  [initandlisten] ** WARNING: Access control is not enabled for the database.
2020-10-16T22:07:54.786+0530 I  CONTROL  [initandlisten] **          Read and write access to data and configuration is unrestr
icted.
2020-10-16T22:07:54.786+0530 I  CONTROL  [initandlisten]
---
Enable MongoDB's free cloud-based monitoring service, which will then receive and display
metrics about your deployment (disk utilization, CPU, operation statistics, etc).

The monitoring data will be available on a MongoDB website with a unique URL accessible to you
and anyone you share the URL with. MongoDB may use this information to make product
improvements and to suggest MongoDB products and deployment options to you.

To enable free monitoring, run the following command: db.enableFreeMonitoring()
To permanently disable this reminder, run the following command: db.disableFreeMonitoring()
---

> show dbs
admin   0.000GB
config  0.000GB
local   0.000GB
tgs     0.000GB
> use tgs
switched to db tgs
> db.getCollectionNames()
[ "carts", "items", "orders", "subscribers", "users" ]
> db.users.find()
{ "_id" : ObjectId("5f9558fbfd7ed52bfcea4b3e"), "firstName" : "Saloni", "lastName" : "Anand", "email" : "Saloni0408@gmail.com",
 "password" : "Saloni12345", "phnumber" : "9810377216", "newsletter" : true, "__v" : 0 }
>
```

Given below is the schema used:

```
const mongoose = require('mongoose');
const Schema = mongoose.Schema;
const ItemSchema = new Schema({
meal: String,
item: String,
description: String,
price: Number,
name: String
});
const Item = mongoose.model('items', ItemSchema);
module.exports.Item = Item;
const UserSchema = new Schema({
firstName: String,
lastName: String,
email: String,
password: String,
phnumber: String,
newsletter: Boolean
});
const User = mongoose.model('user', UserSchema);
module.exports.User = User;
const SubscriberSchema = new Schema({
email: String
});
const Subscriber = mongoose.model('subscribers', SubscriberSchema);
module.exports.Subscriber = Subscriber;
const CartSchema = new Schema({
email: String,
item: String,
name: String,
quantity: Number,
totalprice: Number
});
const Cart = mongoose.model('cart', CartSchema);
module.exports.Cart = Cart;
const OrderSchema = new Schema({
email: String,
item: String,
name: String,
quantity: Number,
totalprice: Number,
date: String
});
const Order = mongoose.model('orders', OrderSchema);
module.exports.Order = Order;
```

Express-session is the package used for creating and maintaining sessions in Node.js. In our project, sessions will be used to enable users to login and enable certain functionalities like placing an order or reserving a table only after login.

Our database is divided into six parts or collections on MongoDB as follow:

1) **Items:** This stores all the items available in the menu. These items have the following attributes:

attribute	Description
_id	Object Id
item	Name of the item
description	Details of what the item is and its ingredients
meal	The category in menu under which the item is
price	Cost of the item

2) **Users:** This stores the details of all the customers that have an account on the website.

attribute	Description
_id	Object Id
firstName	First name of the user
lastName	Last name of the user
email	Email of the user
password	Password set by the user
phnumber	Phone number of the user

Once a user has finished making a new account, they receive an email thanking them for joining the website and all their details are stored in the database. If the user forgets their password, all they need to do is enter their email-id and their password will be sent to them so that they can access their account. **Nodemailer** is used for sending these emails. Nodemailer is a package used for sending mails with ease. It is licensed under the MIT license.

3) **Carts:** Stores details of all the items that have been added to the cart by users but haven't been ordered.

attribute	**Description**
_id	Object Id
quantity	Quantity of the item ordered
item	Name of the item ordered
email	Email of the user
totalprice	Price of the item multiplied by its quantity

Customers can store items that they wish to buy in the cart. These items can then be deleted or their quantities can be altered. Until the user decides to buy these items or delete them, the details of these items are stored in the database.

4) **Orders:** Stores details of all the orders made by customers on the site.

attribute	**Description**
_id	Object Id
quantity	Quantity of the item ordered
item	Name of the item ordered
email	Email of the user
totalprice	Price of the item multiplied by its quantity

Once the user decides to buy the items in the cart their details are saved in this part of the database from where the people in the restaurant can view orders and start preparing to deliver them.

5) **Subscribers:** Stores details of all the customers who have subscribed to the newsletter.

attribute	Description
_id	Object Id
email	Email of the user

The customers can subscribe to the newsletter through which they can get regular updates on changes in the menu, opening of new branches, coupons, and any new offers that might be available for them.

6) **Reservations:** Stores details of the reservations made by customers.

attribute	Description
_id	Object Id
firstName	First name of the user
lastName	Last name of the user
email	Email of the user
tableno	Number of the table that has been reserved
time	The time for which the table has been reserved

The customer can reserve a table if they plan on visiting the restaurant later. Once the table has been reserved, they will receive an email confirming it which they can show at the restaurant as proof of their reservation.

6. New Improvements:

1) The website displays the locations of the seats so that the customer can choose where they want to sit in the restaurant. This is much more convenient then the existing system in which the only thing that the customers can choose is the number of seats at the table. The user can also book a table at the restaurant according to their suitable time and number of people by checking the availability and vacancy. It also shows you which seats are already reserved so that you can make your choice accordingly.

Along with that, users can also see a 360 degree view of the restaurant to get the best experience.

2) Customers can give additional instructions on the site for their reservations or orders. For example, if a parent wants to celebrate their child's birthday they can request the restaurant to set up balloons, cake and other birthday decorations before their arrival.

3) Customers can opt for valet parking beforehand when they make reservations so that they have the valet waiting for them when they arrive.

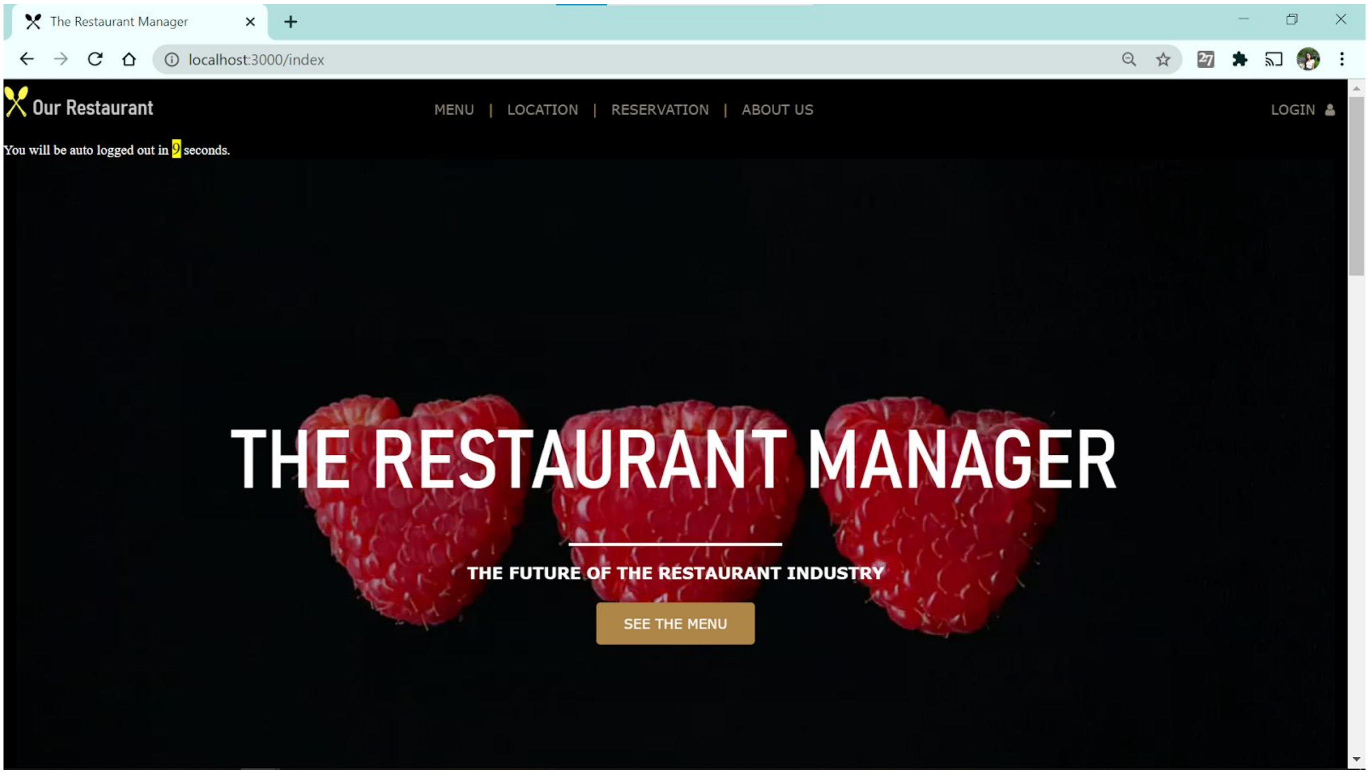
4) We provide a One Time Password authentication on signing up so that there is no breach of security. After some time, the OTP expires and a new one should be requested.

5) An automatic idle session timeout has been put on the website after 1 minute after which the user would have to login again to maintain security.

6) A recommendation of food items can be given to the restaurant using AJAX.

7. Working module screenshots:

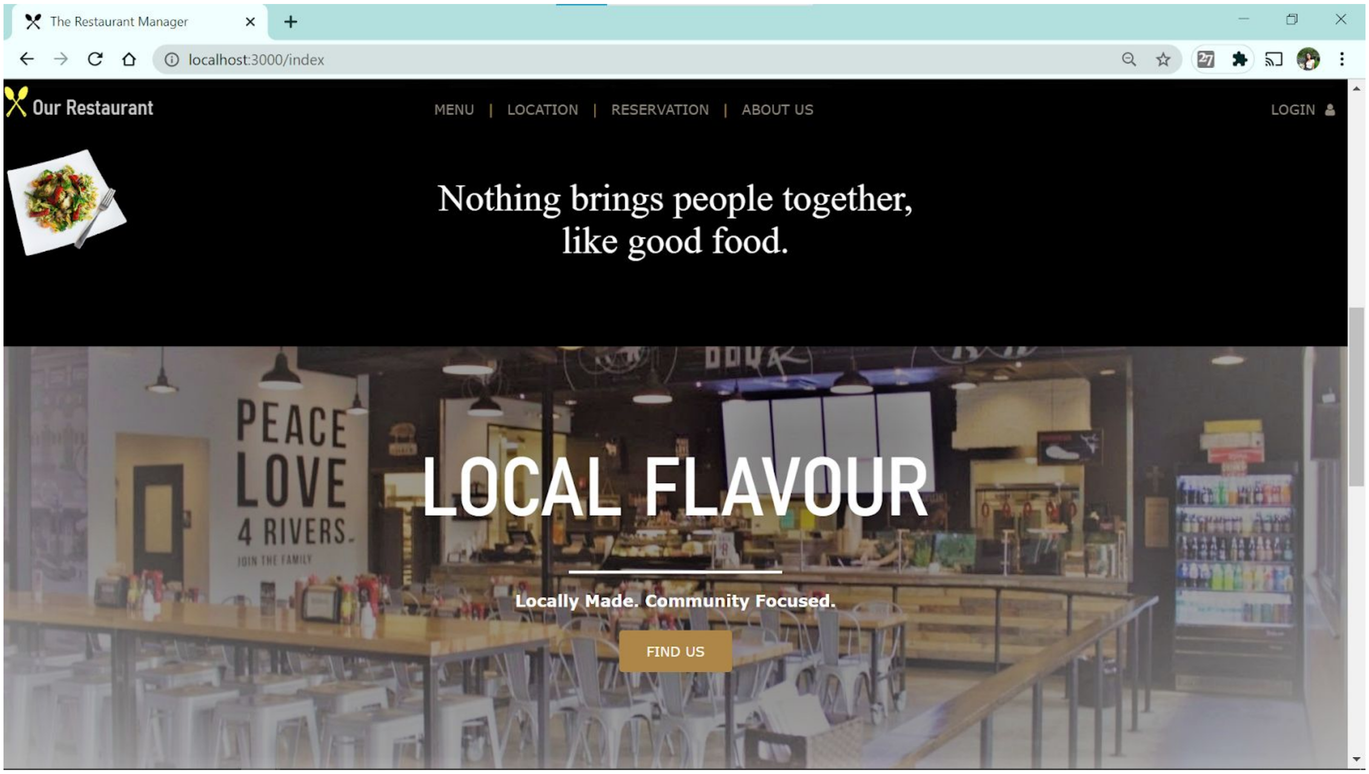
Main Index page:



You will be auto logged out in 9 seconds.

THE RESTAURANT MANAGER

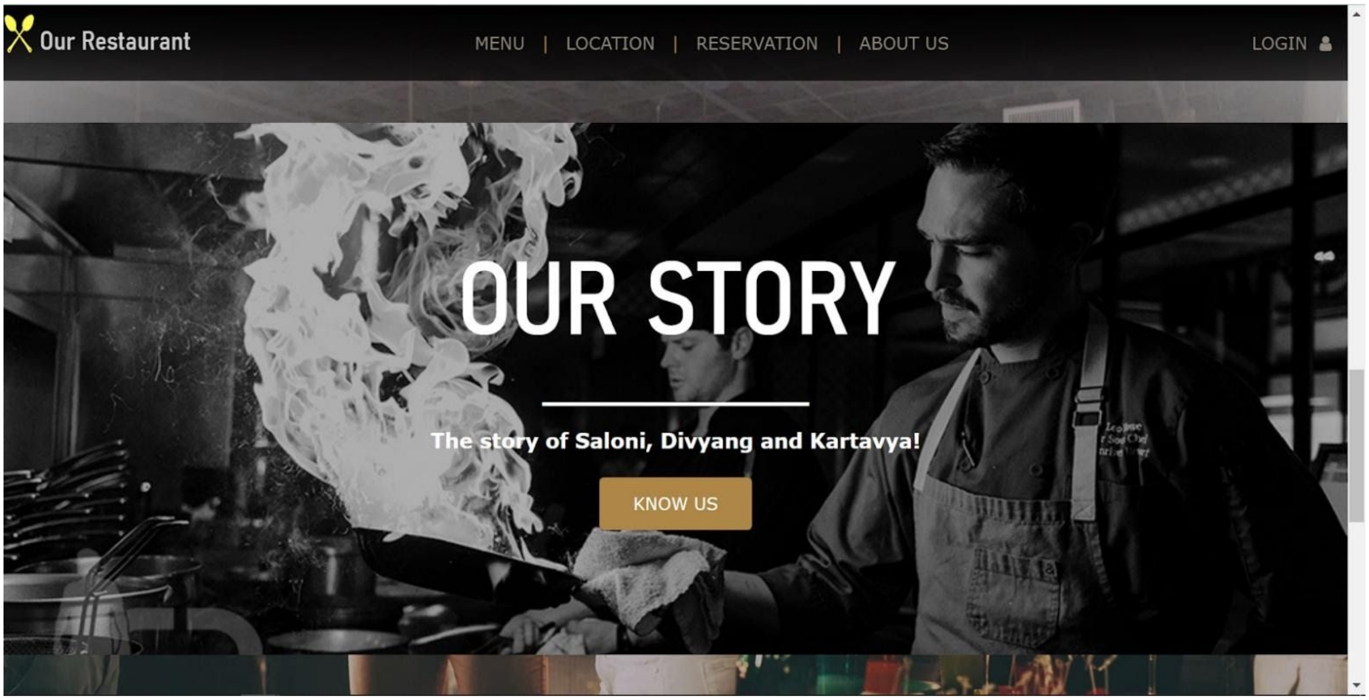
THE FUTURE OF THE RESTAURANT INDUSTRY



Nothing brings people together, like good food.

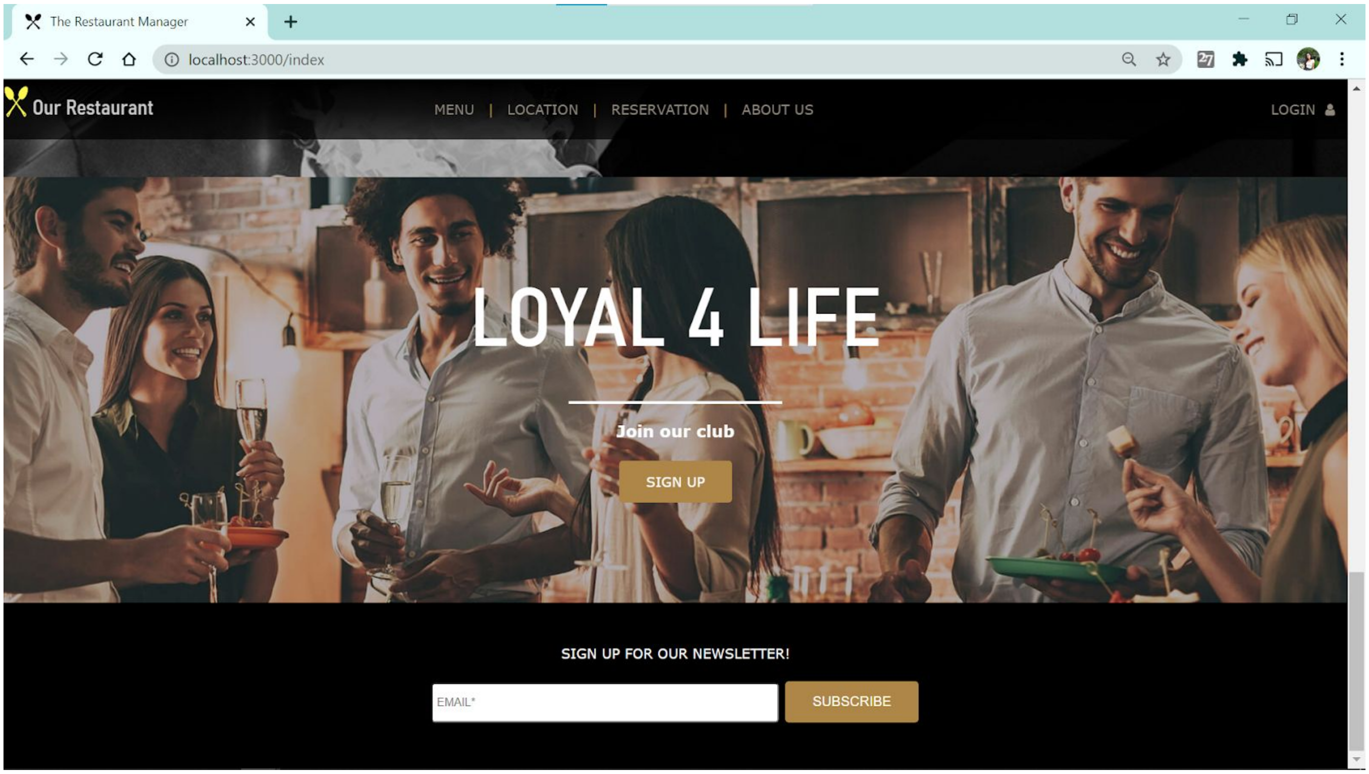
LOCAL FLAVOUR

Locally Made. Community Focused.



OUR STORY

The story of Saloni, Divyang and Kartavya!

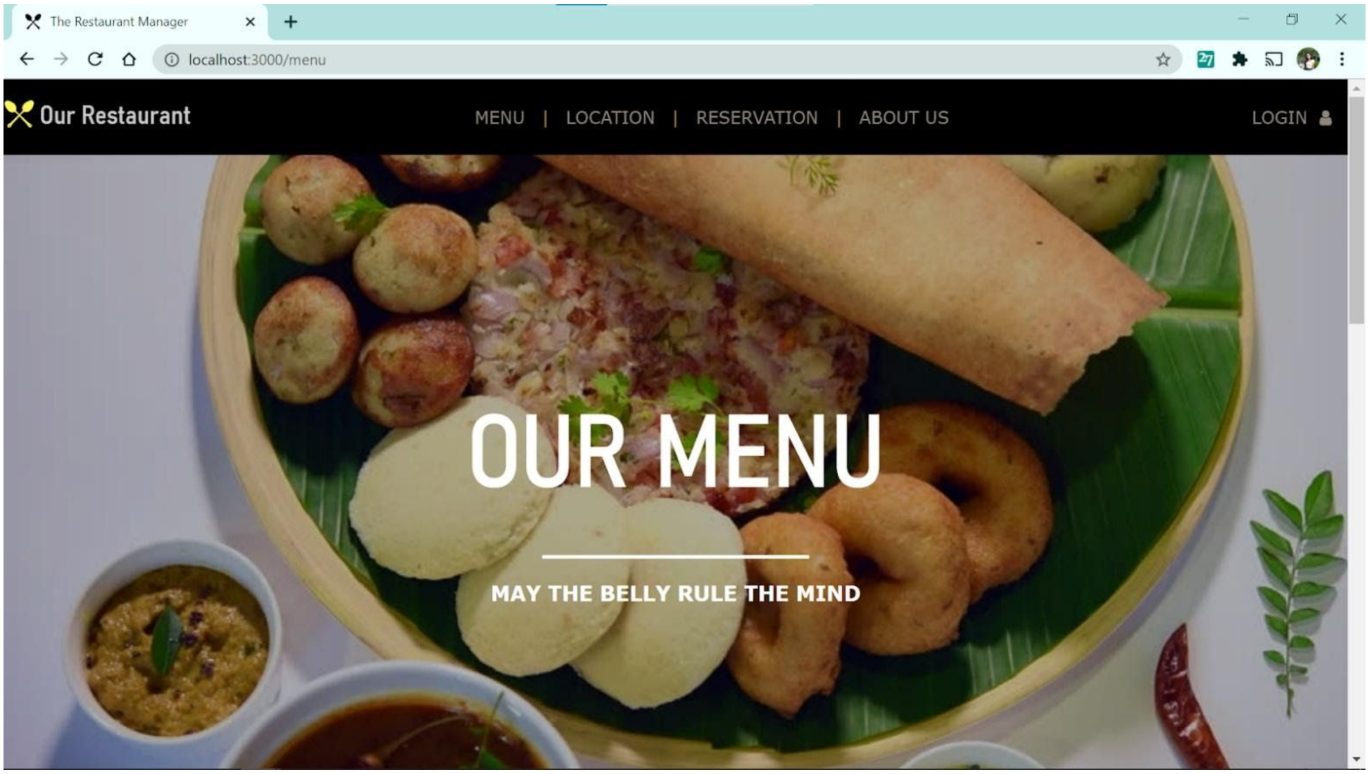


LOYAL 4 LIFE

Join our club

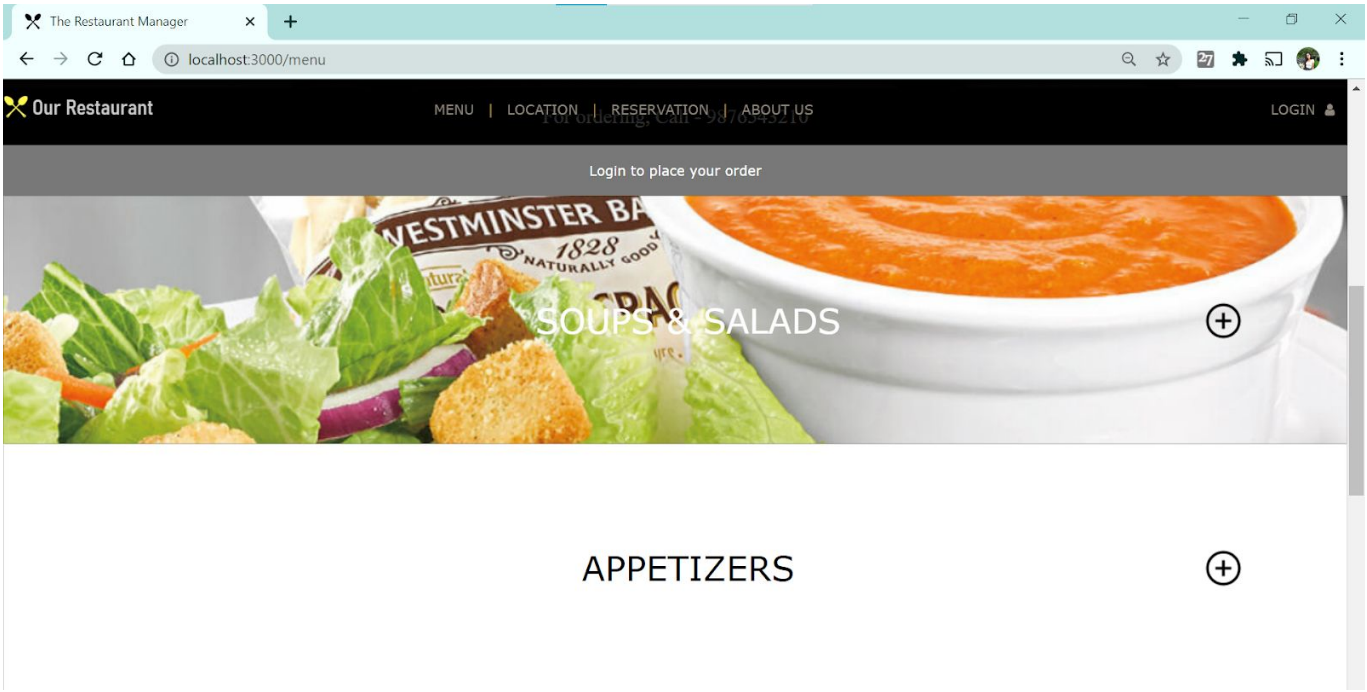
SIGN UP FOR OUR NEWSLETTER!

Menu page:



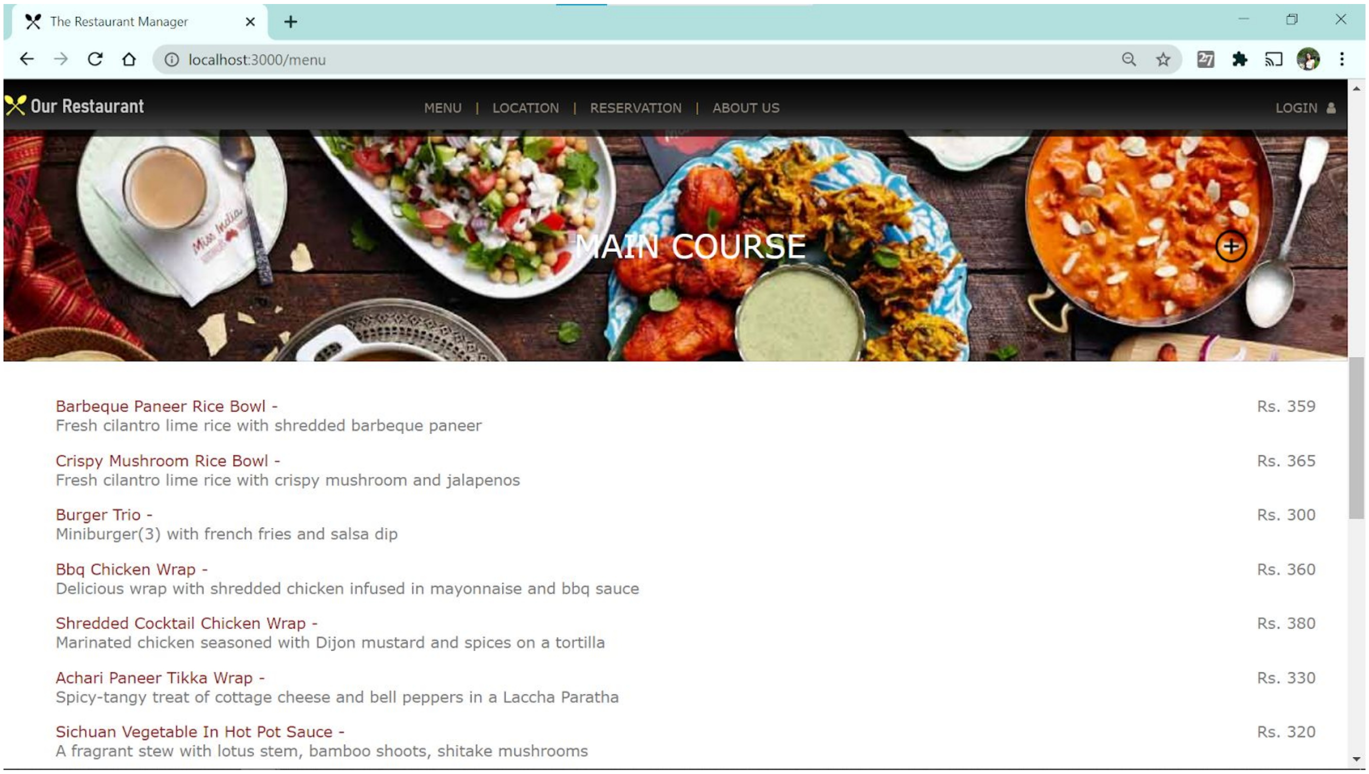
OUR MENU

MAY THE BELLY RULE THE MIND



For ordering, Call - 9876543210

Login to place your order



Barbeque Paneer Rice Bowl - Rs. 359
Fresh cilantro lime rice with shredded barbeque paneer

Crispy Mushroom Rice Bowl - Rs. 365
Fresh cilantro lime rice with crispy mushroom and jalapenos

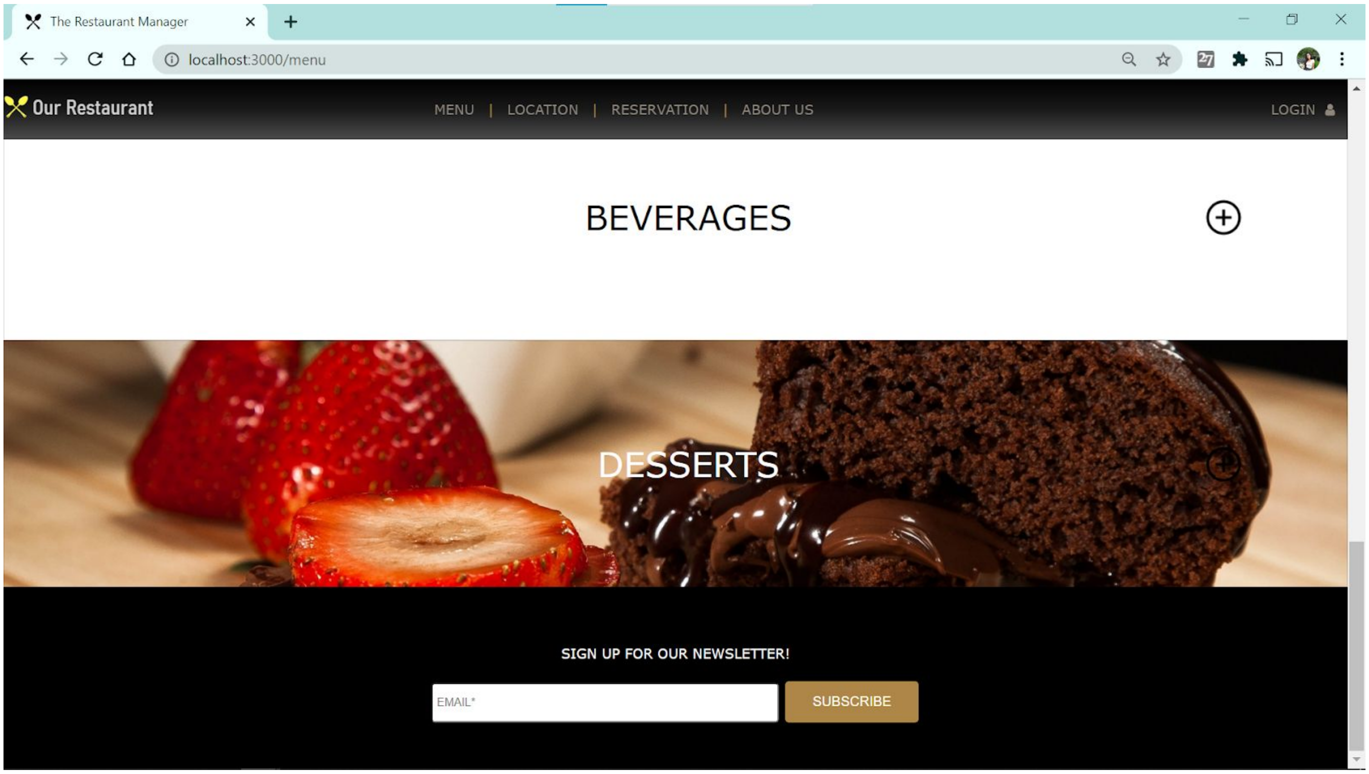
Burger Trio - Rs. 300
Miniburger(3) with french fries and salsa dip

Bbq Chicken Wrap - Rs. 360
Delicious wrap with shredded chicken infused in mayonnaise and bbq sauce

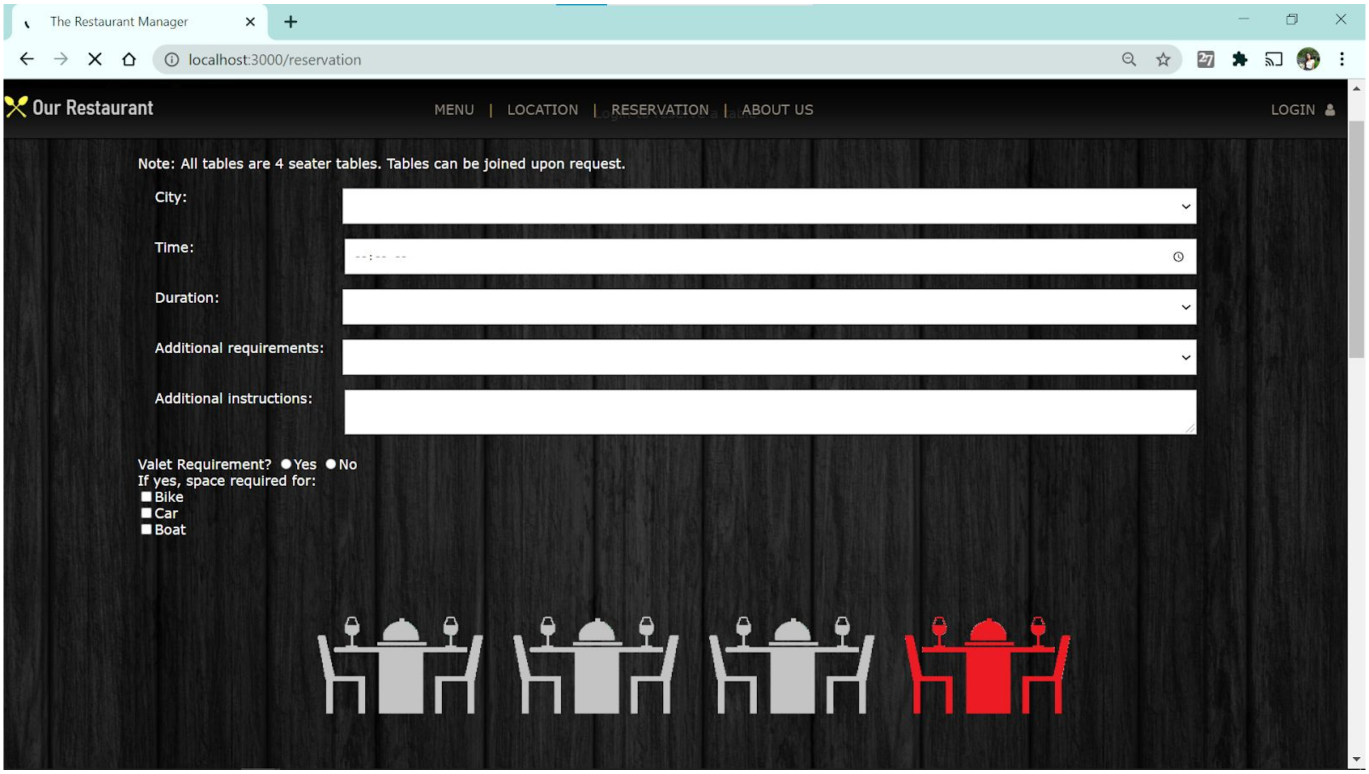
Shredded Cocktail Chicken Wrap - Rs. 380
Marinated chicken seasoned with Dijon mustard and spices on a tortilla

Achari Paneer Tikka Wrap - Rs. 330
Spicy-tangy treat of cottage cheese and bell peppers in a Laccha Paratha

Sichuan Vegetable In Hot Pot Sauce - Rs. 320
A fragrant stew with lotus stem, bamboo shoots, shitake mushrooms



Reservation Page:


The Restaurant Manager
localhost:3000/reservation
Our Restaurant
MENU | LOCATION | RESERVATION | ABOUT US
LOGIN

Note: All tables are 4 seater tables. Tables can be joined upon request.

City:

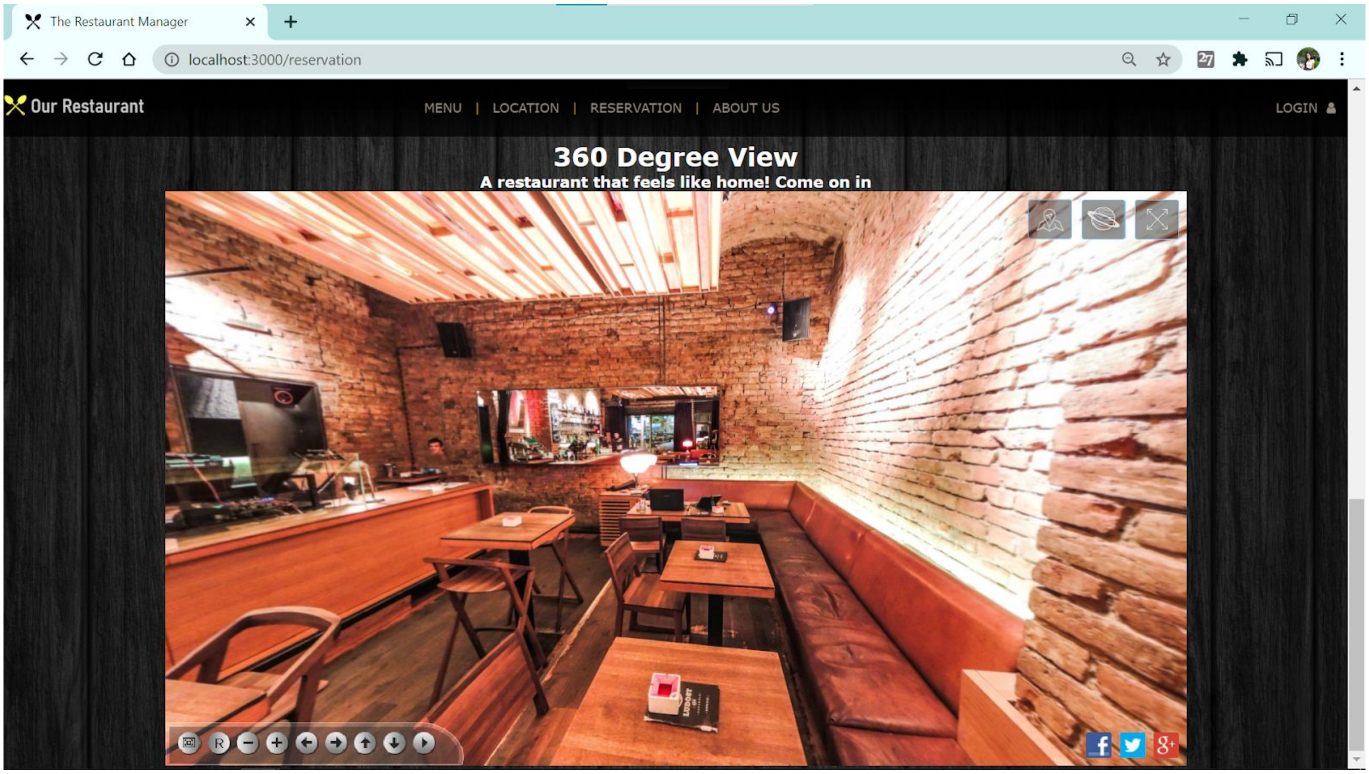
Time: --:-- --

Duration:

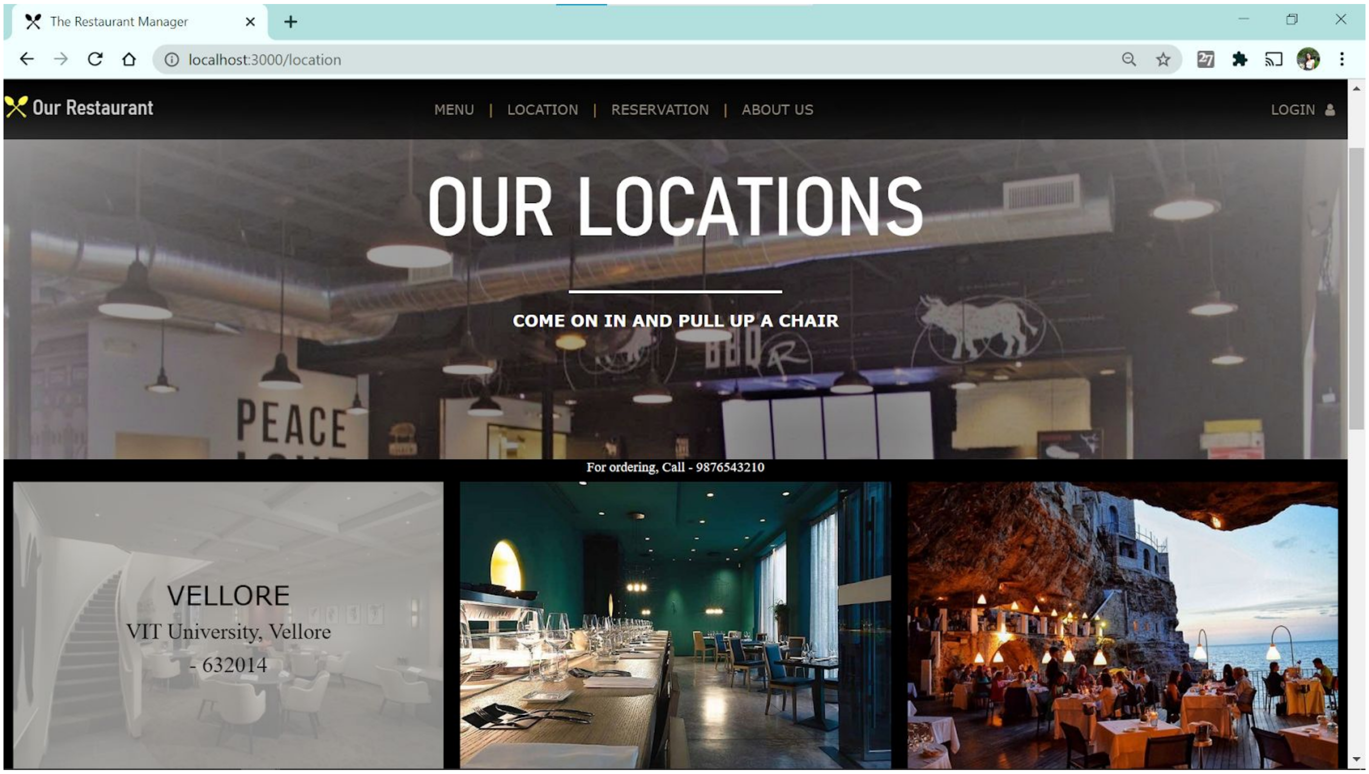
Additional requirements:

Additional instructions:

Valet Requirement? ● Yes ● No
If yes, space required for:
■ Bike
■ Car
■ Boat


The Restaurant Manager
localhost:3000/reservation
Our Restaurant
MENU | LOCATION | RESERVATION | ABOUT US
LOGIN
360 Degree View
A restaurant that feels like home! Come on in
R

Location page:



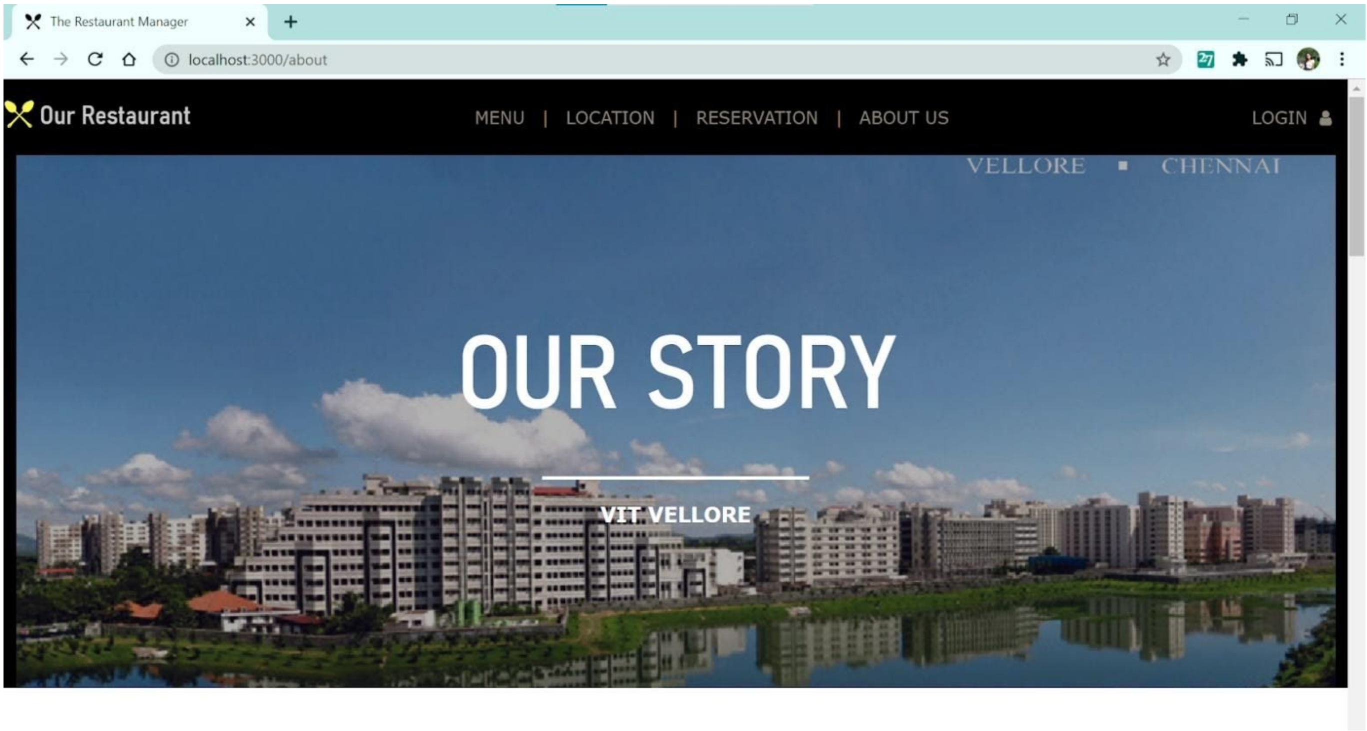
OUR LOCATIONS

COME ON IN AND PULL UP A CHAIR

For ordering, Call - 9876543210

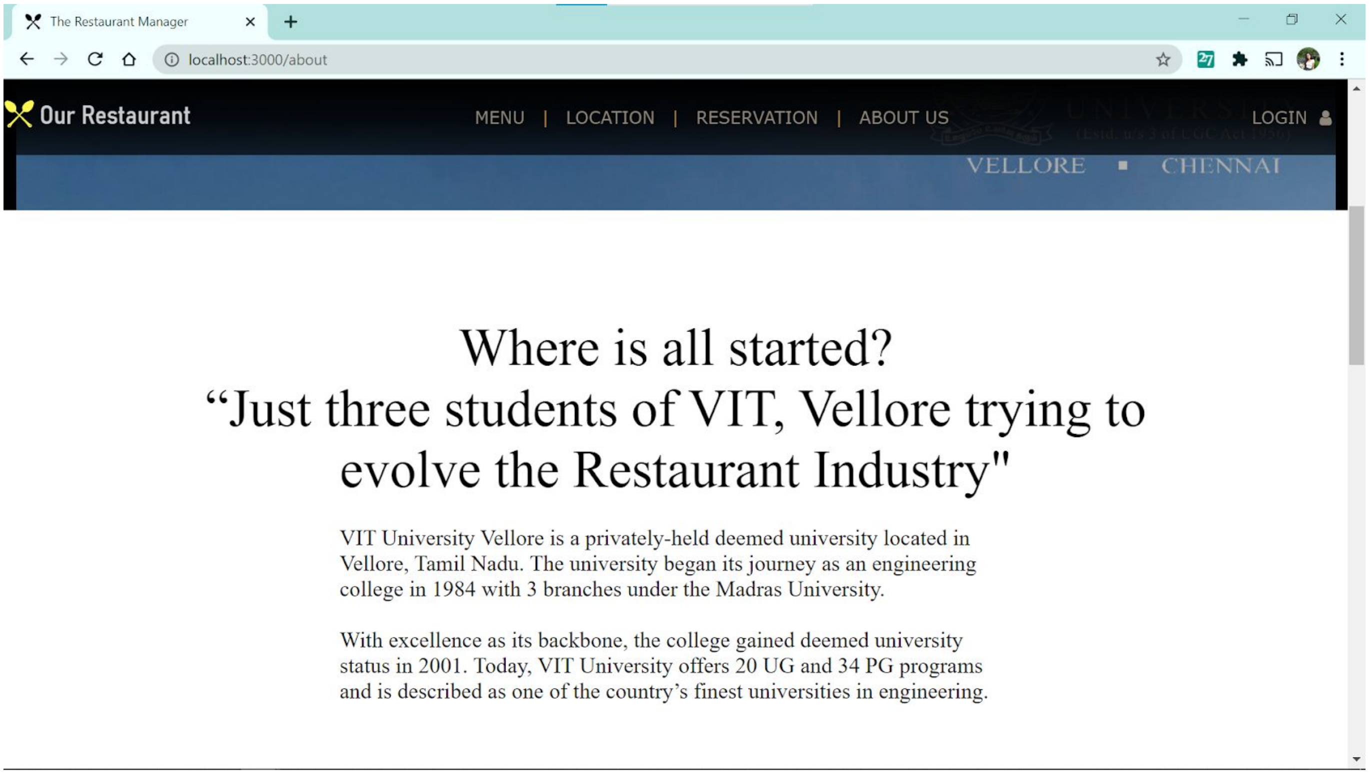
VELLORE
VIT University, Vellore
- 632014

About Us Page:



OUR STORY

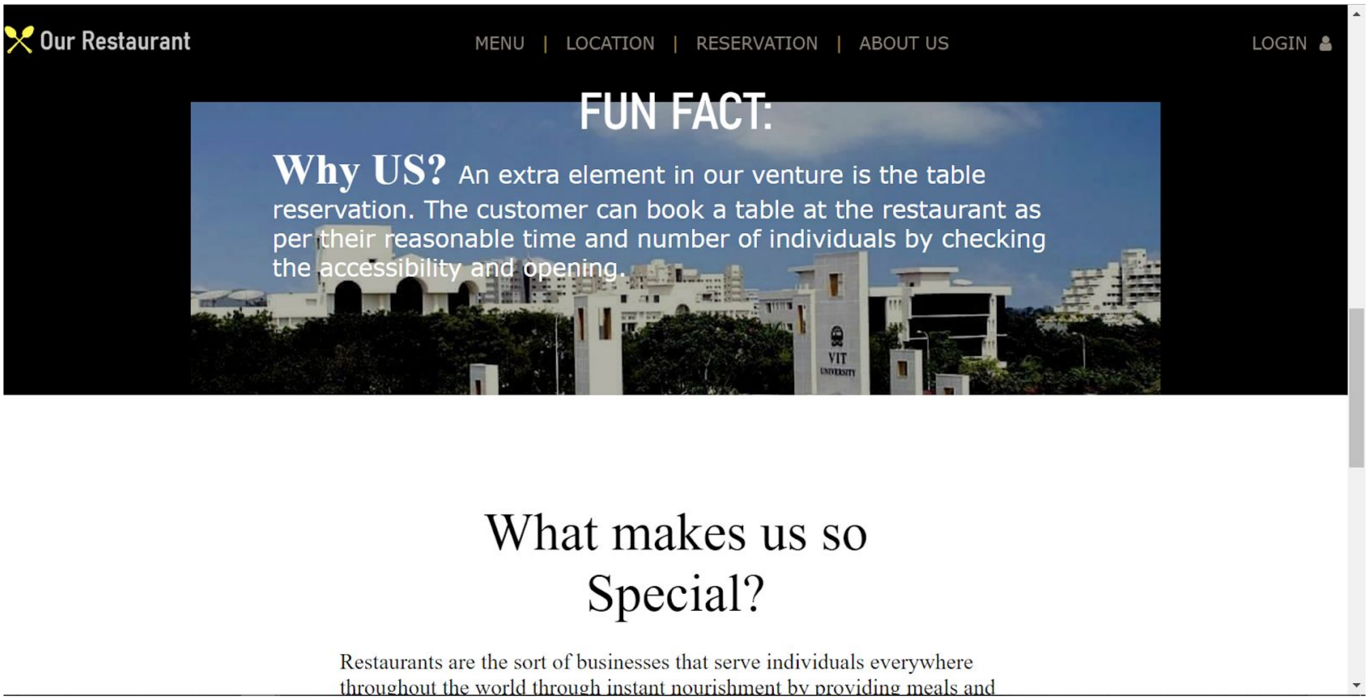
VIT VELLORE



Where is all started?
“Just three students of VIT, Vellore trying to evolve the Restaurant Industry"

VIT University Vellore is a privately-held deemed university located in Vellore, Tamil Nadu. The university began its journey as an engineering college in 1984 with 3 branches under the Madras University.

With excellence as its backbone, the college gained deemed university status in 2001. Today, VIT University offers 20 UG and 34 PG programs and is described as one of the country’s finest universities in engineering.



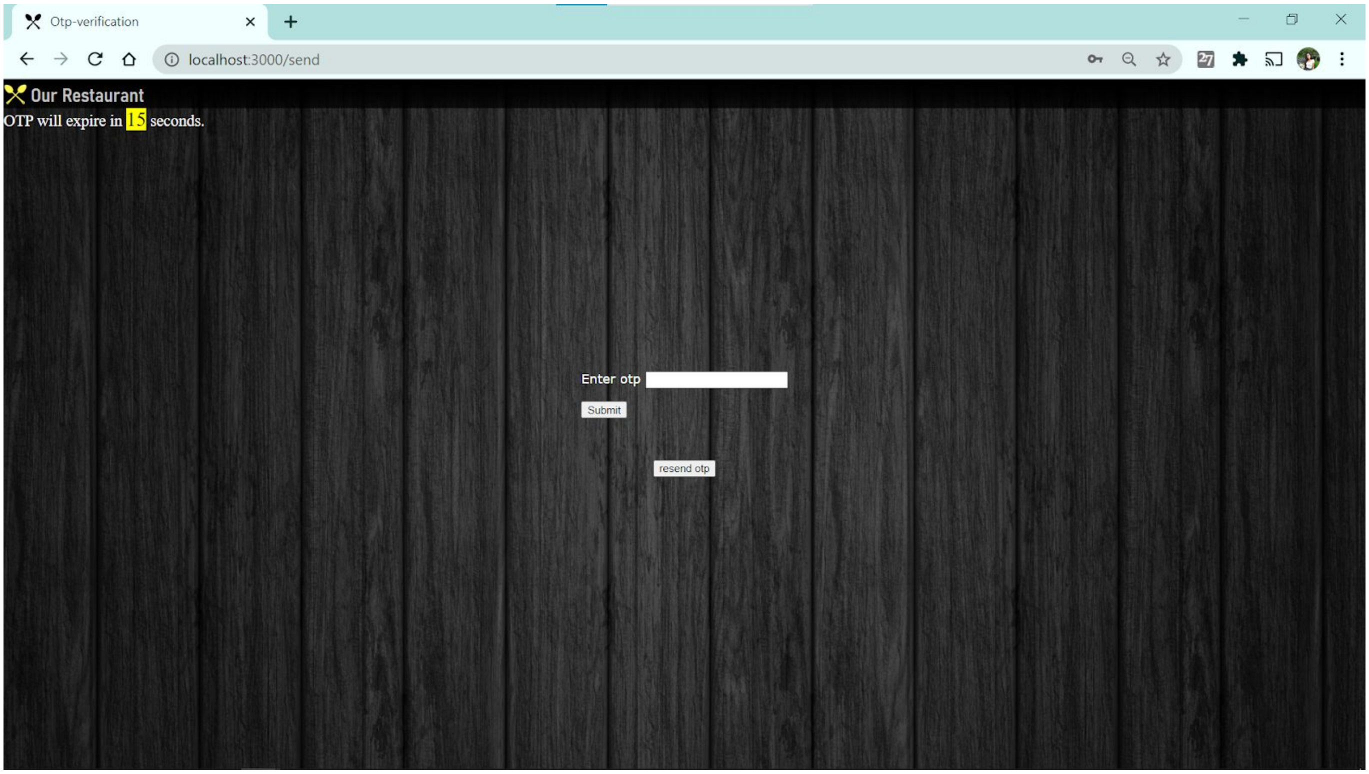
FUN FACT:

Why US? An extra element in our venture is the table reservation. The customer can book a table at the restaurant as per their reasonable time and number of individuals by checking the accessibility and opening.

What makes us so Special?

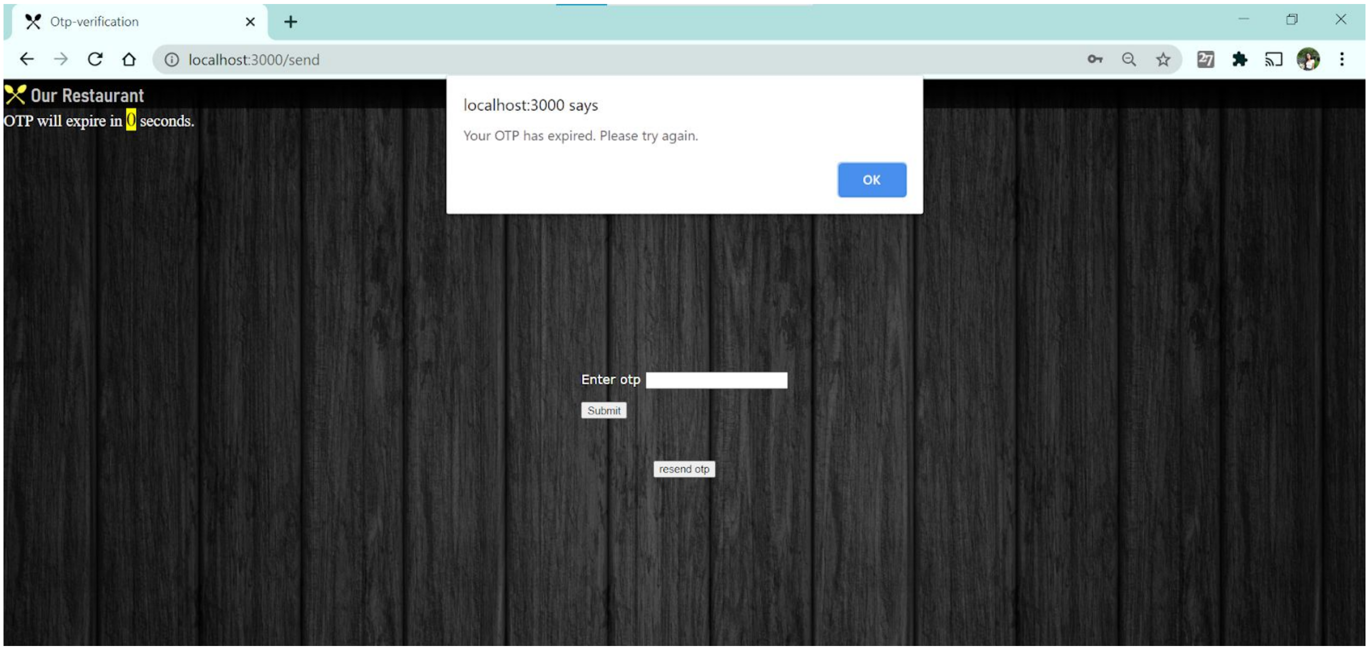
Restaurants are the sort of businesses that serve individuals everywhere throughout the world through instant nourishment by providing meals and

On signup, OTP Verification and authentication along with OTP timeout:



OTP will expire in 15 seconds.

Enter otp



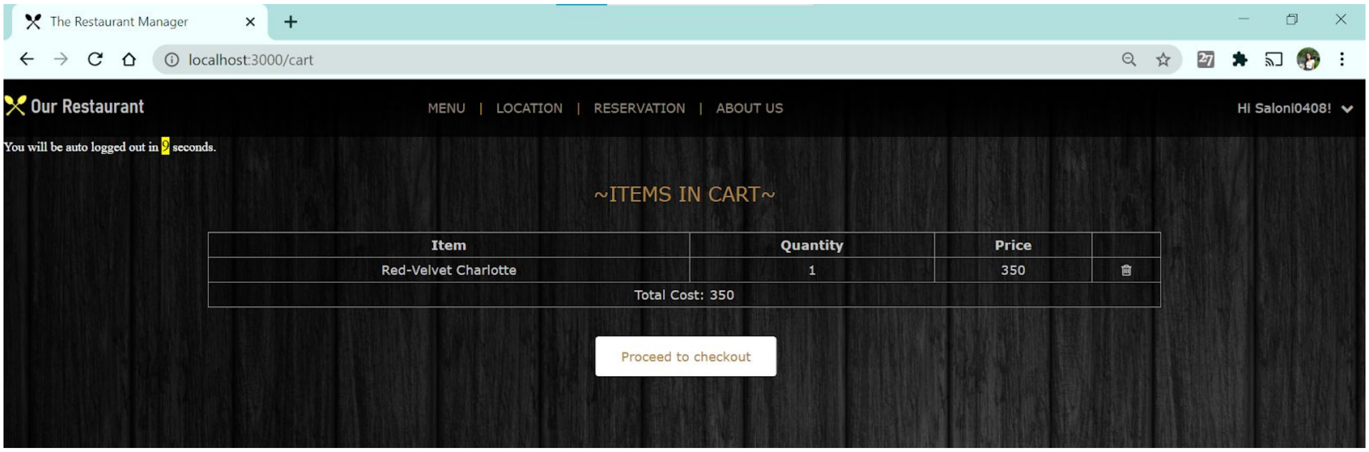
OTP will expire in 0 seconds.

localhost:3000 says

Your OTP has expired. Please try again.

Enter otp

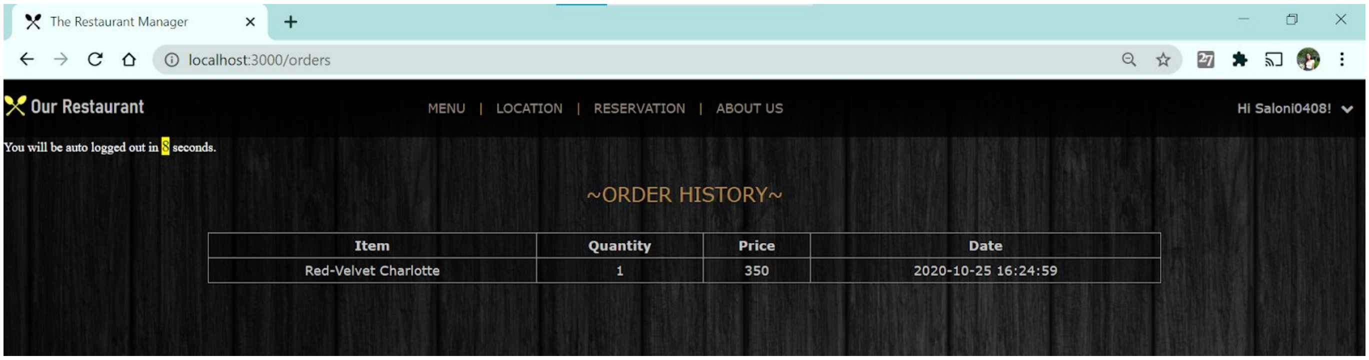
On logging in, Cart and Order History:



You will be auto logged out in 9 seconds.

~ITEMS IN CART~

Item	Quantity	Price	
Red-Velvet Charlotte	1	350	🗑
Total Cost: 350			

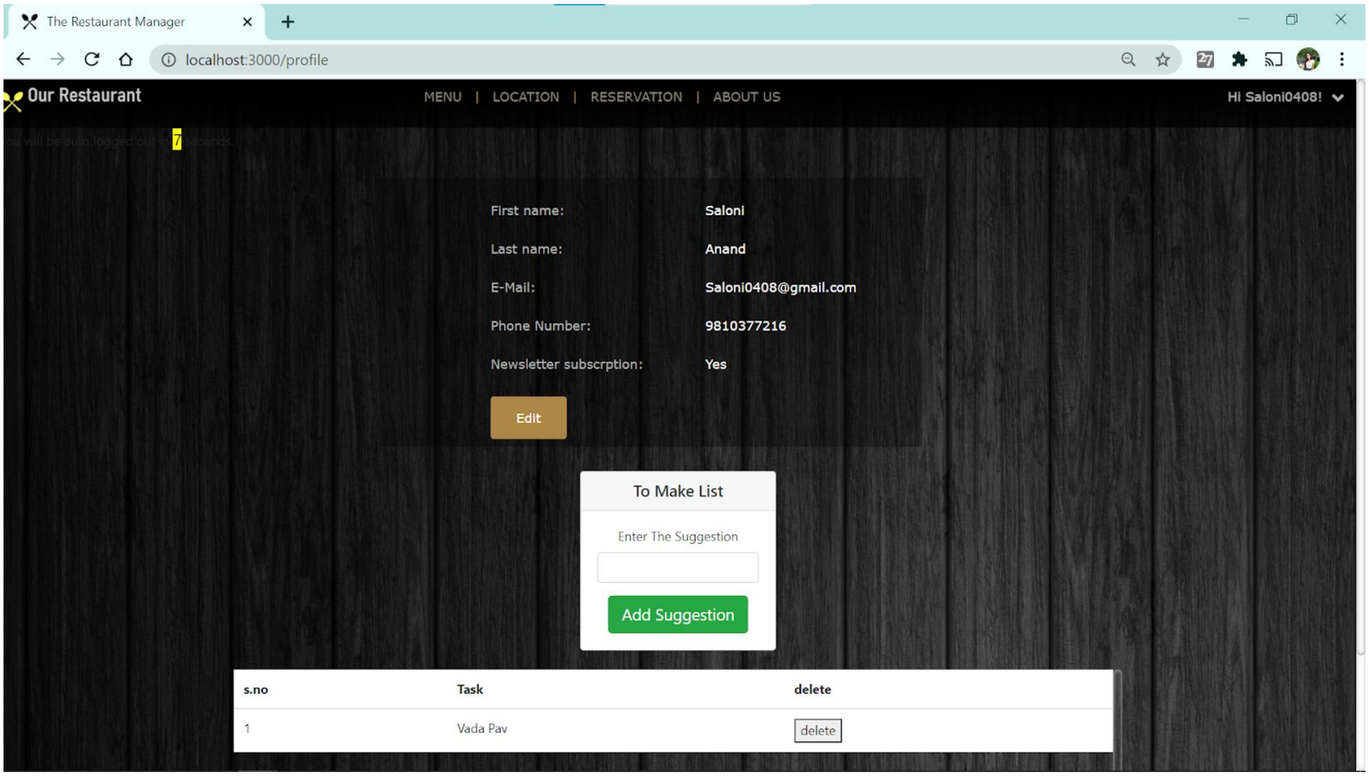


You will be auto logged out in 8 seconds.

~ORDER HISTORY~

Item	Quantity	Price	Date
Red-Velvet Charlotte	1	350	2020-10-25 16:24:59

User Profile along with To-Make Suggestion Box:



You will be auto logged out in 7 seconds.

First name:	Saloni
Last name:	Anand
E-Mail:	Saloni0408@gmail.com
Phone Number:	9810377216
Newsletter subscrption:	Yes

To Make List

Enter The Suggestion

s.no	Task	delete
1	Vada Pav	delete

8. Conclusion:

The Restaurant Management was achieved through a simple use of graphical interface menu options for ordering food and booking a table. This web application that was developed automated the day to day activity of a restaurant making it easier for the restaurant as well as the customers. This facility helps increase the ease of ordering and booking for customers without directly interacting with the restaurant.

9. Future Work:

There are various fields where we can improve our website. In future we want to connect our website to google maps to enable live tracking of food order or to enable users to just pin their location on a map without typing it. Regular Customers can get discounts on their next order. We can also develop a functionality for the people in the restaurant to login and see the database on the site. This can also lead to improved efficiency such as chefs getting the orders directly in their accounts decreasing human intervention and making the process more automated.

9. References:

- Fonts used in website: https://cdnjs.cloudflare.com/ajax/libs/font-awesome/4.7.0/css/font-awesome.min.css
- CSS help: https://developer.mozilla.org/en-US/docs/Web/CSS/CSS_Selectors
- General Implementation and Debugging help: www.stackoverflow.com
- Syntax help (for all languages): www.w3schools.com
- MongoDB help: https://docs.mongodb.com/manual/tutorial/install-mongodb-on-windows/
- Node Js help: https://phoenixnap.com/kb/install-node-js-npm-on-windows

10. Code Link:

https://github.com/saloni-anand/Restaurant.git