Kathmandu BernHardt College

(Affiliated to Tribhuwan University)

A Project Pre Defense Report

“Restaurant Management System”

(HungeR Manage)

Under the supervision of

Anil Verma

Submitted to

Department of Computer Science and Information Technology

Kathmandu BernHardt College

Bafal, Kathmandu, Nepal

Submitted by

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3.Naresh Poudel

April, 2023

Acknowledgement

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We would like to acknowledge the contributions of our colleagues and friends who have provided me with assistance, encouragement and necessary data and information to develop the restaurant management system throughout the project in developing a system that meets users' needs and requirements. Their feedback and suggestions have been immensely valuable in shaping the project's outcomes.

Thank you all for your valuable contributions to this project.

Group Member

Binaya Shrestha

Nabin Chalise

Naresh Poudel

Abstract

Restaurant Management System (HungeR Manage) will assist restaurants in streamlining and managing their daily operations. It is simpler for the waiters to manage orders because they don't have to walk to the kitchen and can easily give the chef the orders. From a management perspective, the system provides all of the data of each employee and orders, allowing the manager to effortlessly control the restaurant. This System decreases manual labor and boosts restaurant productivity. With an online food menu, you can quickly keep track of orders, update your client database, and enhance your meal delivery to customers. The user of this system can choose the desired meal items from the menu that is displayed. When a user purchases meals, they have the option of paying online or via a pay-on-delivery system. Due to the fact that each user has a separate account with a unique ID and password, the user's information is kept private. Consequently, it offers a more secure ordering.

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List Of Abbreviations

DFD	Data Flow Diagram
IDE	Integrated Development Environment
API	Application Programming Interface
PC	Personal Computer
UI	User Interface
ID	Identification
UML	Unified Modeling Language
HTTP	Hypertext Transfer Protocol

1. Chapter 1: Introduction

1.1 Introduction

Restaurant Management System is a new generation of restaurant management software. When users/customers enter the website, he/she should have an account. If the user does not have an account, the user has to create a new account to order food. To create a new account user should enter a unique username, email and new mobile no. with password. User fills his/her address for food delivery. Once a user enters the website, you can see different types of food available in restaurants. First select the category of food from drinks, starter, the main course dishes and desserts. After that, search for food as your interest and select the food you want to order. After selecting all your meals, place your order and confirm your orders. Then the website will show you various types of payment methods and your total bill amount. You can pay cash on delivery or online payment. Also, the customer can track their ordered item and view their ordered status and ordered items details.

This system will assist restaurants in controlling and optimizing their establishments. Because they don't have to walk to the kitchen to readily give the chef orders, the waiters' jobs are made easier. From a management perspective, the manager will be able to manage the restaurant by having easy access to all information and being able to examine the orders and personnel records. The system also gives customers access to a variety of restaurant-related information, such as a contact page with the restaurant's phone number, email address, physical address, social media handles, and a feedback form that can help to enhance the overall customer experience. Also about us page provides information about the owners, chefs, and staff, contains details about the restaurant's gastronomy, hospitality, and sustainability. Customers can gain trust and loyalty by learning more about the restaurant's identity, values, and dedication to excellence via the About Us page. [1]

1.2 Problem Statement

Only a few restaurants and hotels run an online restaurant management system in Nepal. Most of them are manual, which leads to long ques and requested food service time to the customer may take a long time, also you don’t have the choice of your item if it is already sold. Most of the available online running restaurants don’t provide enough services like proper menu, price of the item, quick info about the item, proper tracking system of the ordered items.

1.3 Objectives

The main aim of this Restaurant Management System is:

● To decrease time and workload, control restaurant workflow, and improve customer experience by effectively managing all areas of a restaurant's operations.

1.4 Scope and Limitation

The scope of a restaurant management system project report involves creating a software application that streamlines various restaurant operations. The system should enable order management, inventory tracking, report generation, and be accessible from multiple devices. The system should be secure, scalable, and customizable, fulfill the specific needs and requirements of the restaurant. The project report should provide an overview of the system's features, implementation, and testing processes.

Some limitations of this project are:

- Dependent on stable internet connectivity
- High initial implementation cost
- Staff training required for effective use
- May not be suitable for small or low-budget restaurants
- Sometime order item may not be available

1.5 Development Methodology

The development methodology for an online restaurant management system involves several phases, starting with planning and analysis to identify the goals, requirements, and scope of the project. The design phase involves designing the architecture, user interface, and database schema of the system, while the development phase involves writing the code

and creating any necessary infrastructure components. Testing is performed to ensure that the system meets the requirements and functions properly. Once the system is deployed, ongoing maintenance and support are provided to fix bugs, add new features, and provide technical support. Project management techniques, such as agile methodologies or the waterfall model, should be used, along with best practices for software development, such as using version control systems and conducting code reviews, to ensure that the code is of high quality and maintainable over time.

1.6 Report Organization

This project consists of six chapters. Each chapter includes following section:

Chapter 1- includes the introduction of the project. It explains about what is the program about, how it came into idea, objectives that are planned to be achieved by this software and its area of implementation and limitations.

Chapter 2- includes knowledge about the research related to this topic. It consists background idea for this project as well as study of the project as well as review of the similar/relevant projects, theories and results by other researchers.

Chapter 3- includes identifying requirement analysis such as functional and non -functional for the system. Feasibility analysis of the developed project system. It includes developing use cases, data flow diagrams, and a user interface design.

Chapter 4- consists of translating the requirements gathered during the system analysis phase into a detailed design that can be implemented. It includes designing the database schema, user interface layout, system architecture flowcharts, and other design artifacts.

Chapter 5- implementation and testing of this software is explained. Implementation is done using various tools and testing is carried out using various test cases.

Chapter 6- contains conclusion and recommendation which contains idea about what our group achieved in this project and what are the things that can be achieved but have not achieved in this project.

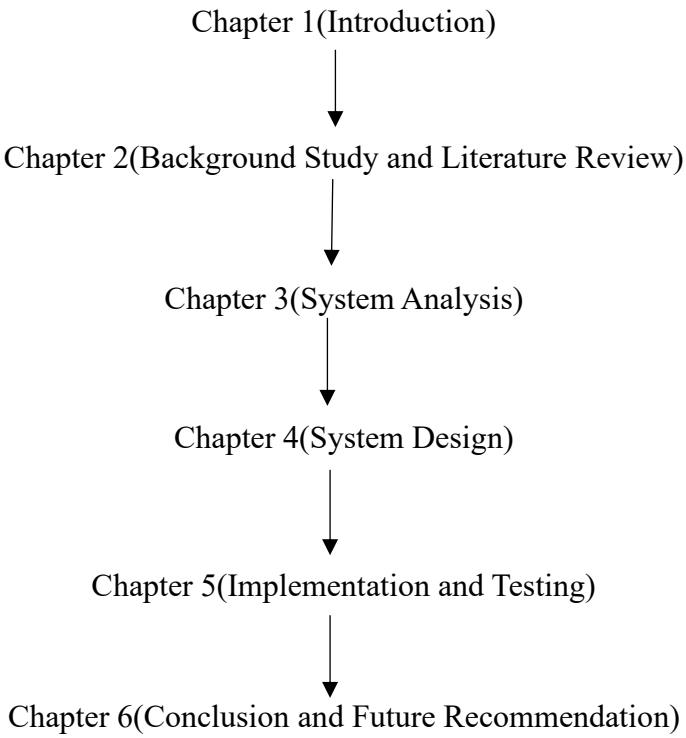

Figure 1:1Report Organization

2. Chapter 2: Background Study and Literature Review

2.1 Background Study

Online restaurant management systems are a crucial tool for restaurant owners to successfully manage their operations, given the substantial movement in the restaurant sector toward online ordering and delivery services in recent years. Numerous advantages are provided by these systems, such as simplified order administration, menu and inventory management, as well as sales and consumer behavior data. However, the majority of existing systems are pricey and uncustomizable, which makes the creation of a unique online restaurant management system an appealing choice for many restaurant owners. Such a system must be developed using a strong, agile development methodology and with a thorough understanding of the specifications and recommended procedures for software development. Therefore, a thorough background investigation is essential for the effective design and deployment of an online restaurant management system.

2.2 Literature Review

In context of our country only a few restaurants and hotels run under an online restaurant management system in Nepal like SMTech's Restaurant Management System, Delta Tech's restaurant management system, Restaurant managements system software- weblink Nepal [2]. Most of them are manual, which leads to long ques and requested food service time to the customer may take a long time. Most of the available online running restaurants don't provide enough services like proper menu, price of the item, quick info about the item, proper tracking system of the ordered items. Restaurant management systems highlights several key benefits of using such a system. For example, research has shown that restaurant management systems can improve order accuracy, reduce wait times, and increase table turnover. They can also help with inventory management, employee scheduling, and financial reporting. However, some challenges may arise when implementing a restaurant management system, such as the need for staff training and potential technical issues. Overall, the literature suggests that restaurant management systems can provide significant benefits for both restaurant owners and customers, but careful planning and implementation are necessary to ensure a successful outcome [3].

3. Chapter 3: System Analysis

3.1 System Analysis

System analysis is an essential step in the development of an online restaurant management system, as it helps to identify the key components, user requirements, and constraints of the system. The analysis involves identifying the necessary functions, including order, inventory, menu, and staff management, and their relationships. User requirements, such as user interface design and payment processing, must also be analyzed, along with potential technical and resource constraints. Risks and issues should also be identified during the analysis to ensure that the system is robust and can operate effectively in real-world scenarios.

3.1.1 Requirement Analysis

i. Functional Requirements

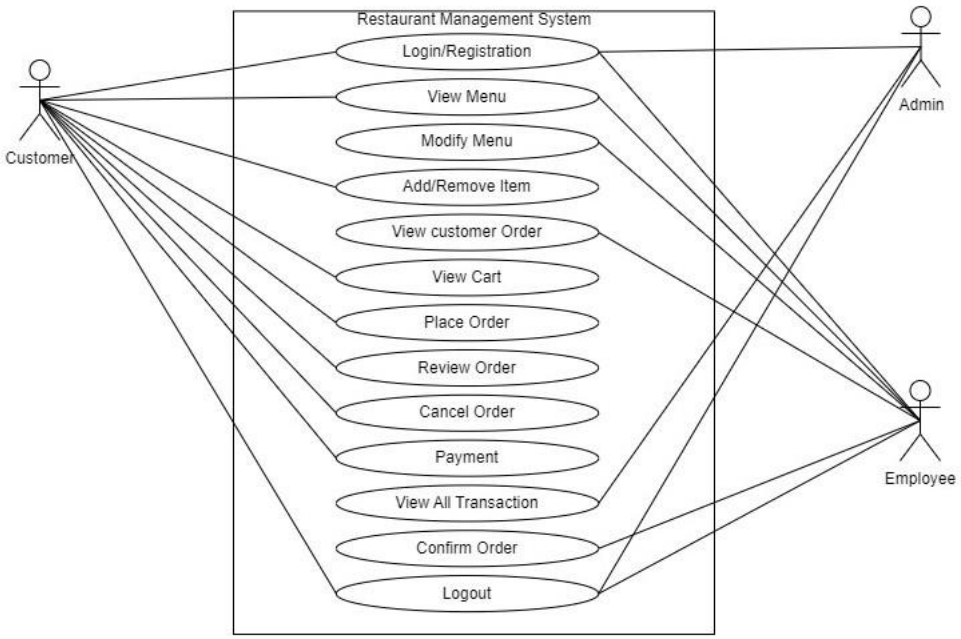

Figure 3:1Use case diagram of the system

This use case diagram for restaurant management system shows the general processes of the system. These processes involve managing restaurant activities as well as their customers' orders and payments. In this process, users aree able to place, review the orders and make their payments. Also, the employee can manage and trace every transaction of the system such as modify order, view order details and confirm order, the admin is able to easily view all the transaction of the system.

ii. Non-Functional Requirements

- **Portability:** Systems running on one platform can easily be converted to run on another platform.
- **Reliability:** The ability of the system to behave consistently in a user-acceptable manner when operating within the environment for which the system was intended.
- **Availability:** The system should be available at all times, meaning the user can access it using a web browser, only restricted by the down time of the server on which the system runs.
- **Maintainability:** A commercial database is used for maintaining the database and the application server takes care of the site.
- **Privacy:** Personal data of the system should not be disclosed to anyone.

3.1.2 Feasibility Analysis

i. Technical

All the tools and software products required to construct this project (Restaurant Management System) are easily available on the web. It requires the concept of python/Django, website development and programming. It needs an IDE. All these aspects are easily affordable. The application requires simple user interfaces and implementation of algorithms. It can be done with some assistance from our supervisor.

ii. Operational

As only smartphones and the internet access is required to use this website. The features provided by our project can help people or customers to view the full menu of restaurants and choose the item with their name, price and picture. The website will make it possible for the user to track their ordered food and also payment and be done online or can be paid in hand.

iii. Economic

The economic feasibility is to determine the economic benefits. In contrast to the project work, the system developed is a website which only requires mobile phone and internet connection. Easy and cheap maintenance of the system is possible. Also, very cheap to go to different places.

iv. Schedule

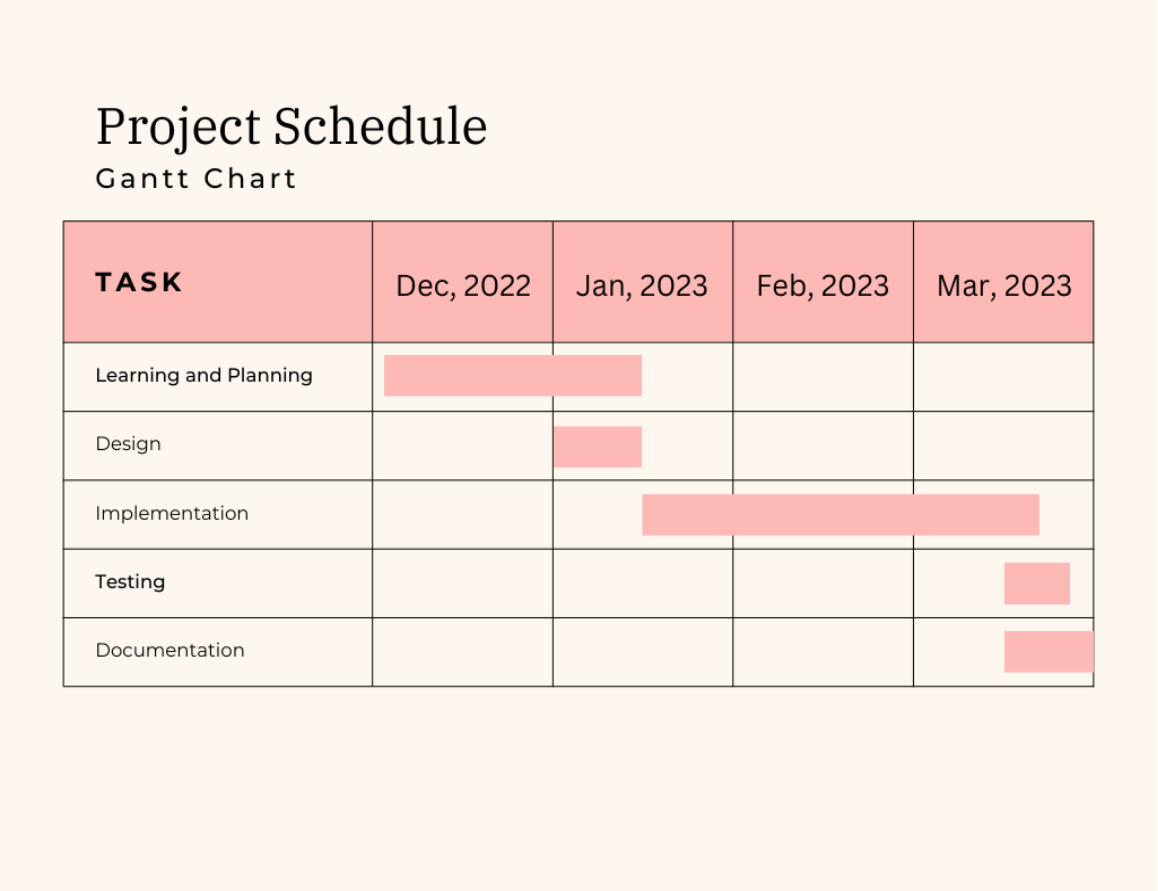

Figure 3:2Gantt Chart Showing Project Schedule

3.1.3 Analysis

- **Object modelling using Class and Object Diagrams**

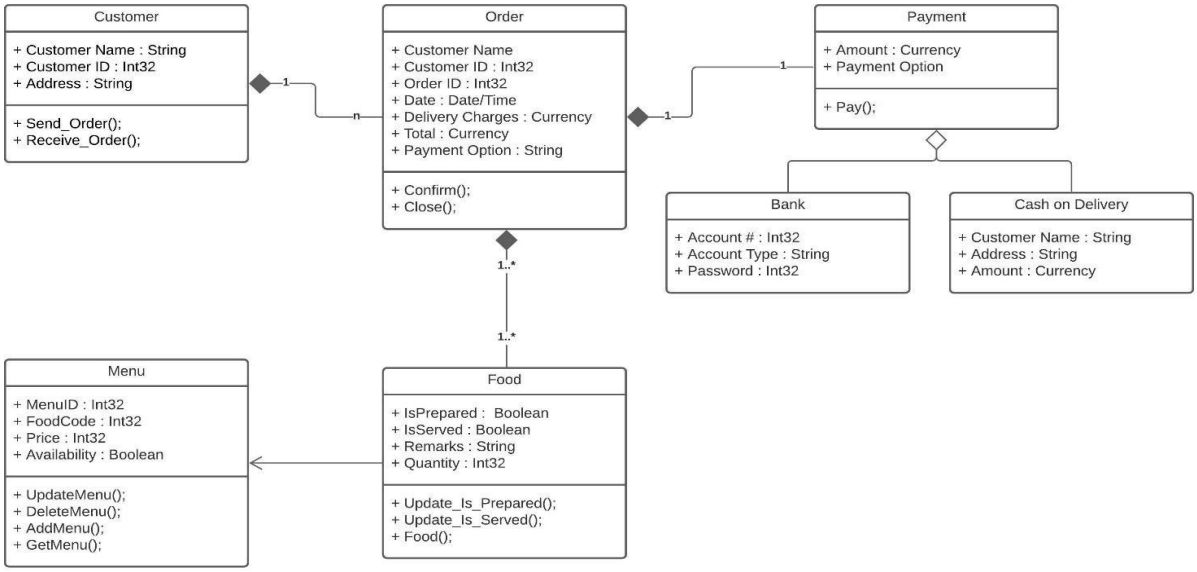

Figure 3:3 Object Modeling using Class Diagram

- **Dynamic modelling using State and Sequence Diagrams**

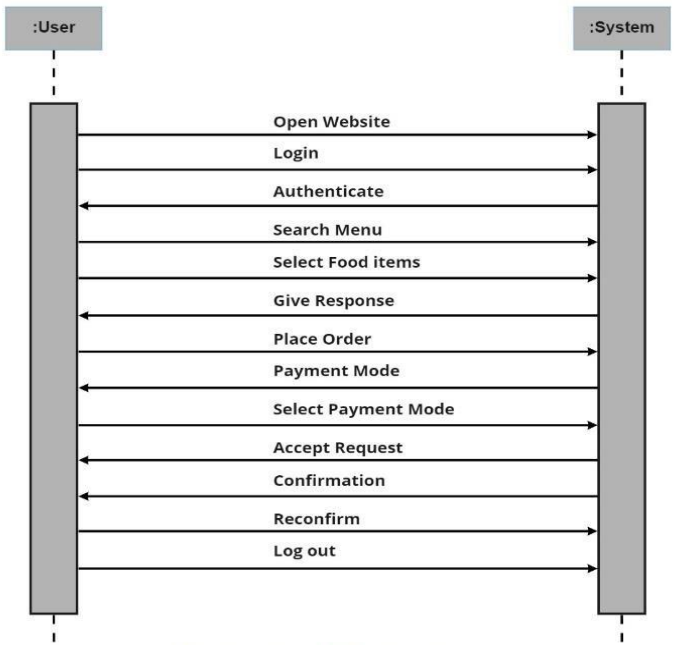

Figure 3:4 Sequence diagram of the system

- **Process modelling using Activity Diagrams**

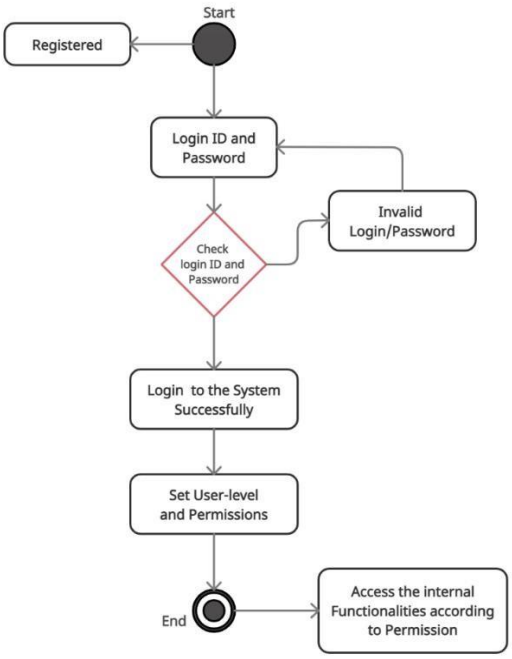

Figure 3:5 Activity Diagram

4. Chapter 4: System Design

4.1 Design

- **Refinement of Class, Object, State, Sequence and Activity Diagrams**

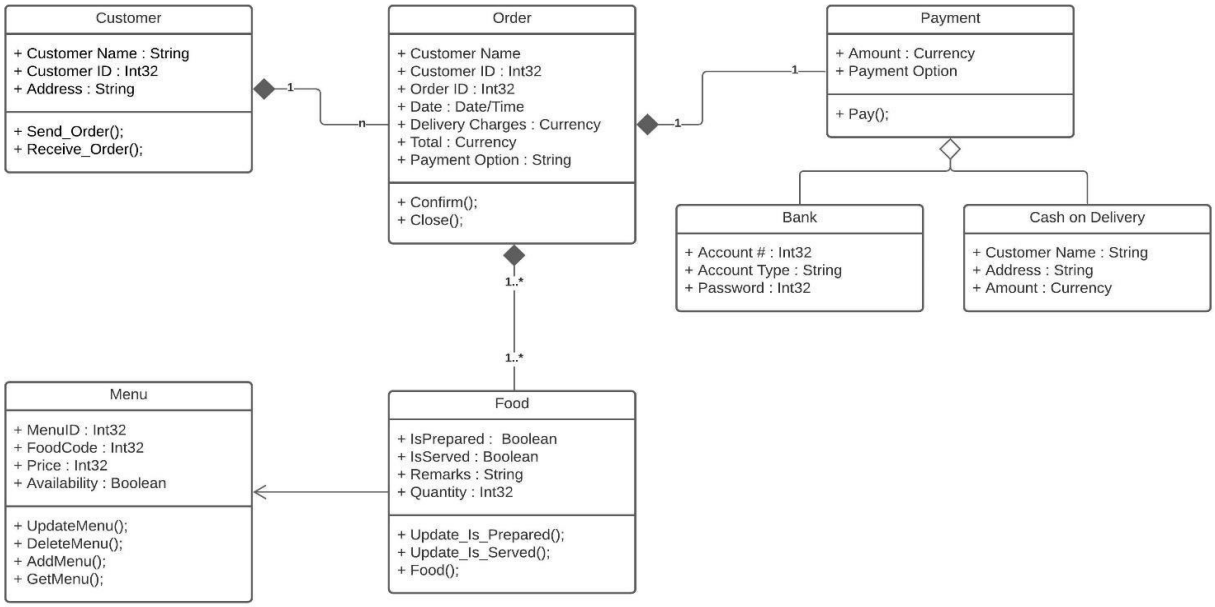

Figure 4:1Refinement of class diagram

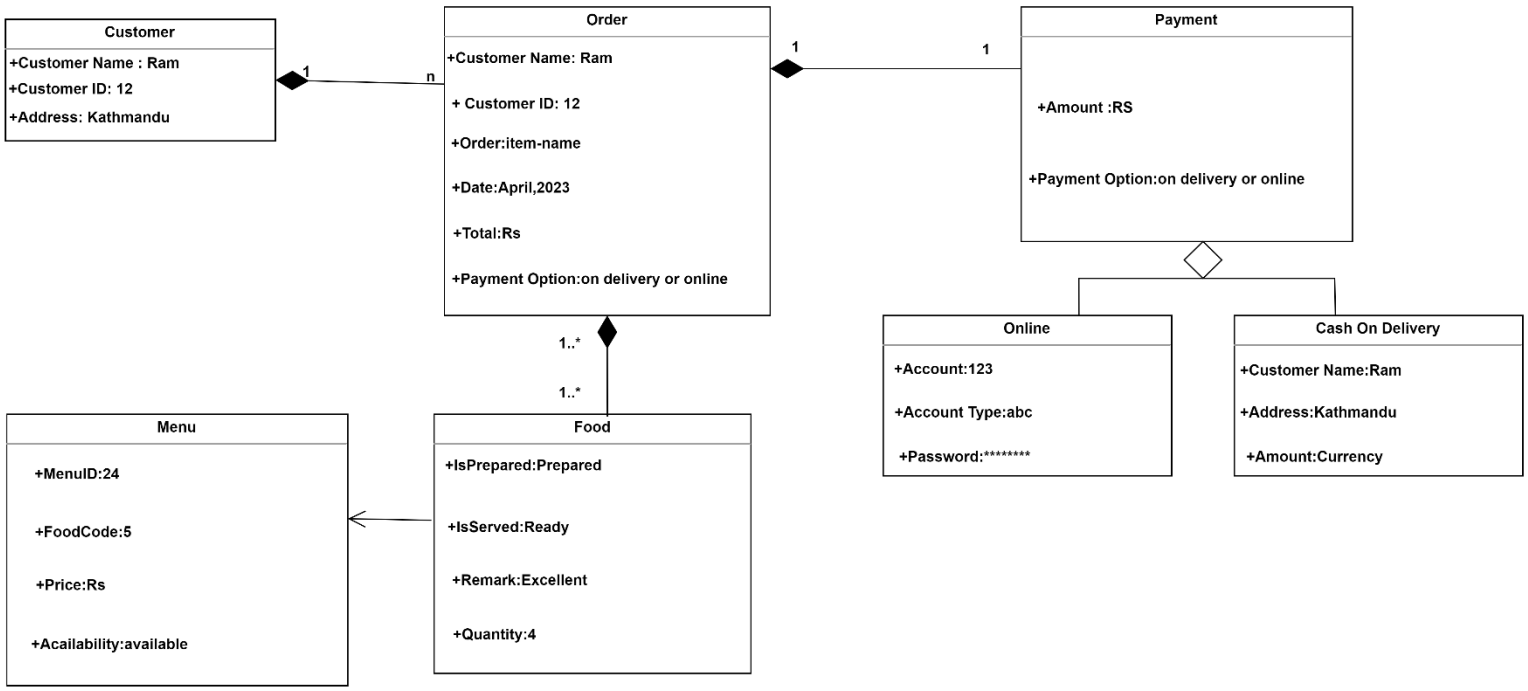

Figure 4:2 Object Diagram of the system

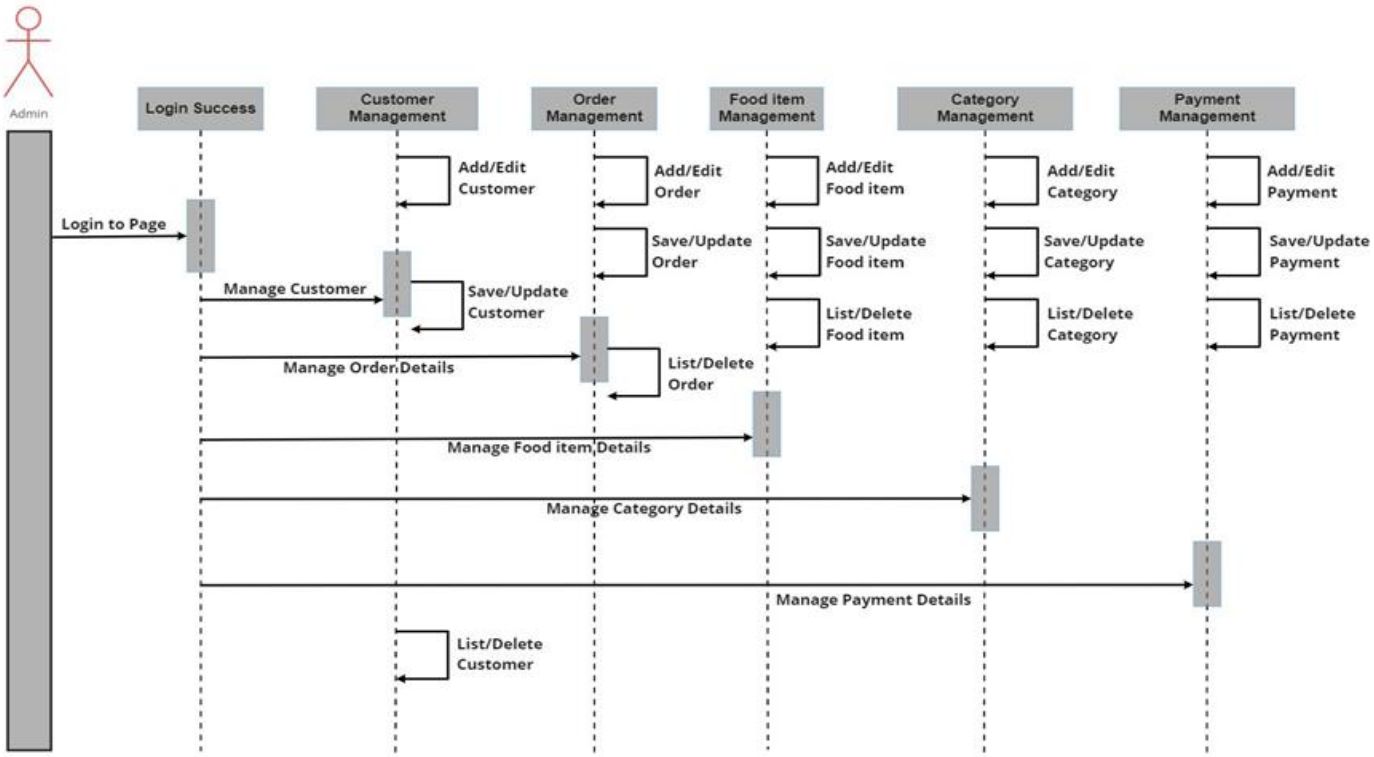

Figure 4:3 login sequence diagram for food ordering system

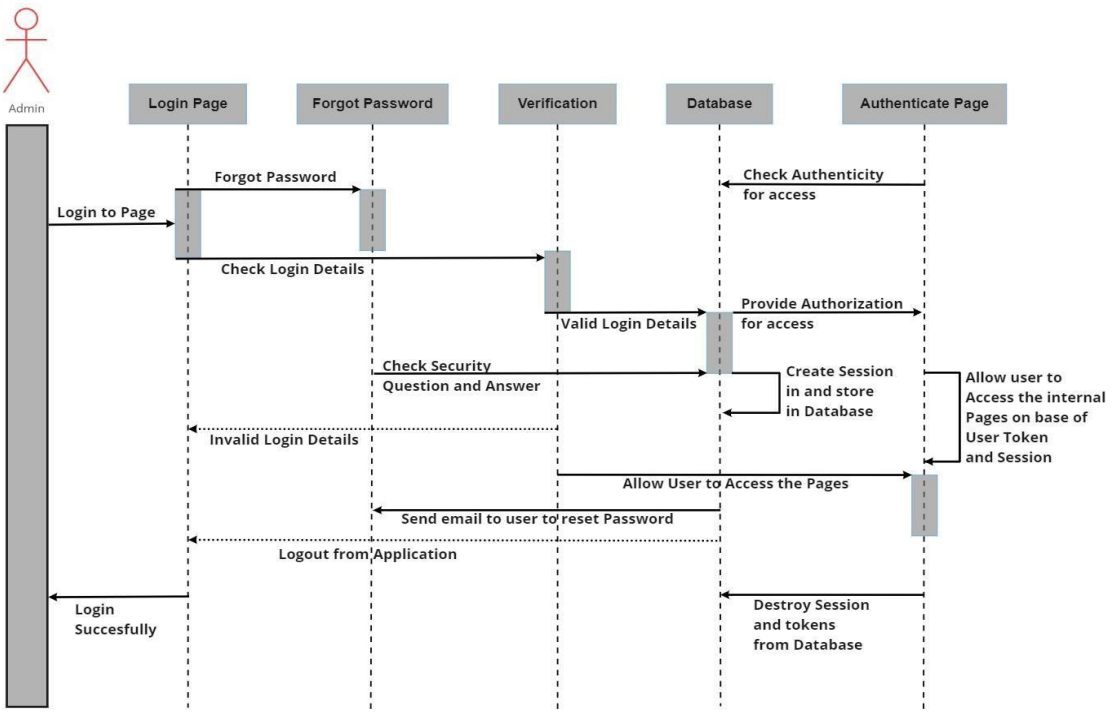

Figure 4:4 UML sequence diagram for food ordering system

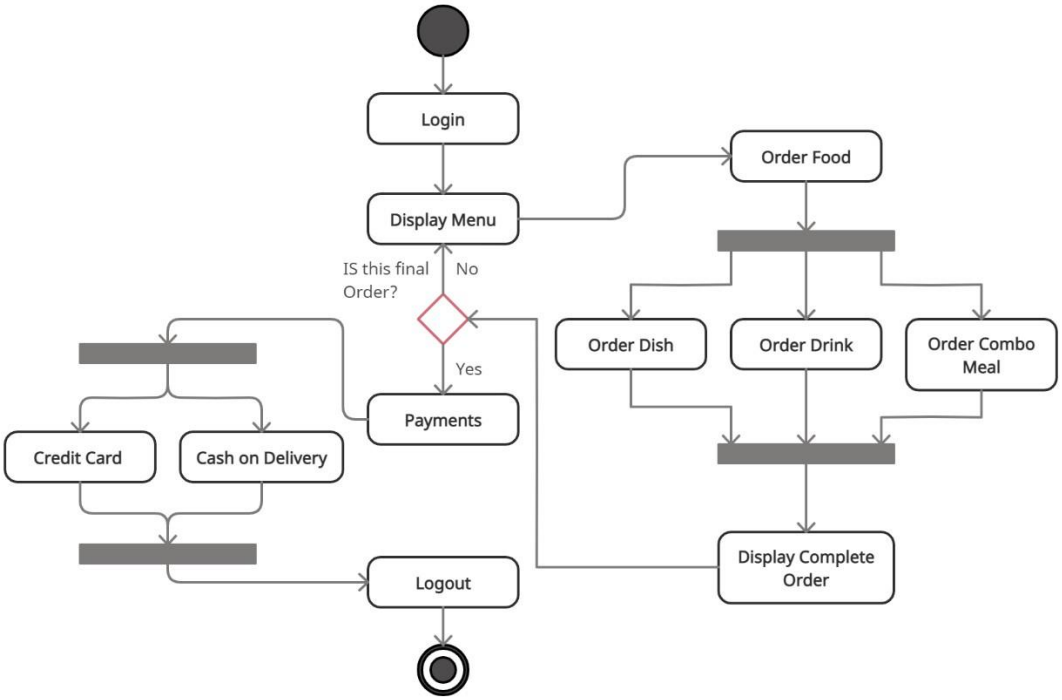

Figure 4:5 Refinement of Activity Diagram

- **Component Diagrams**

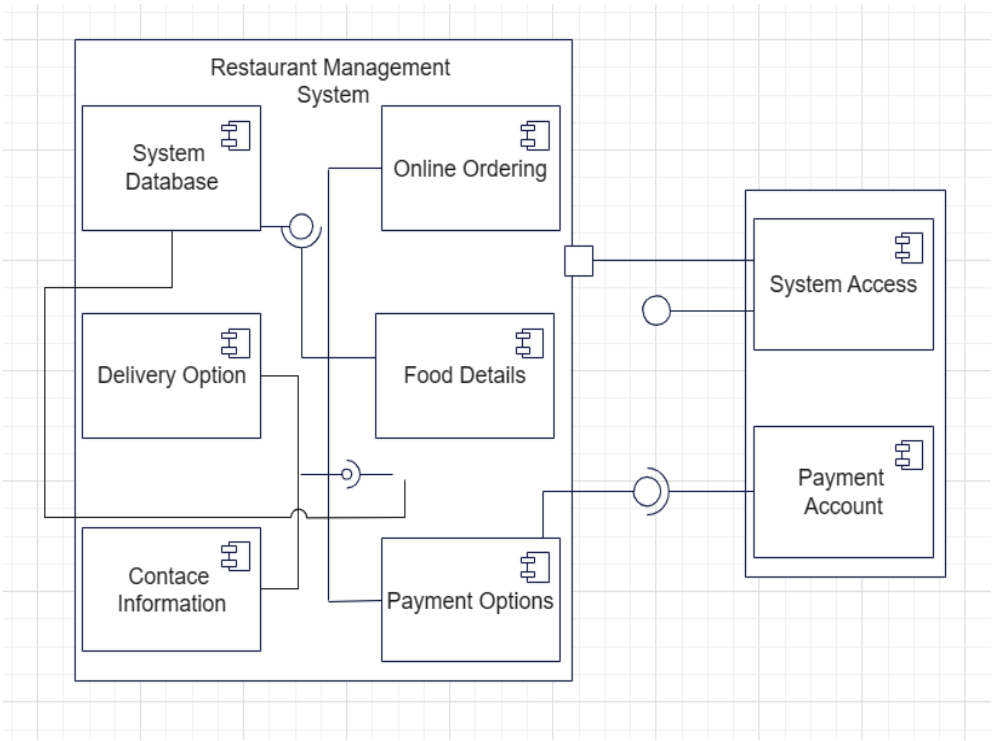

Figure 4:6Component Diagram

- **Deployment Diagrams**

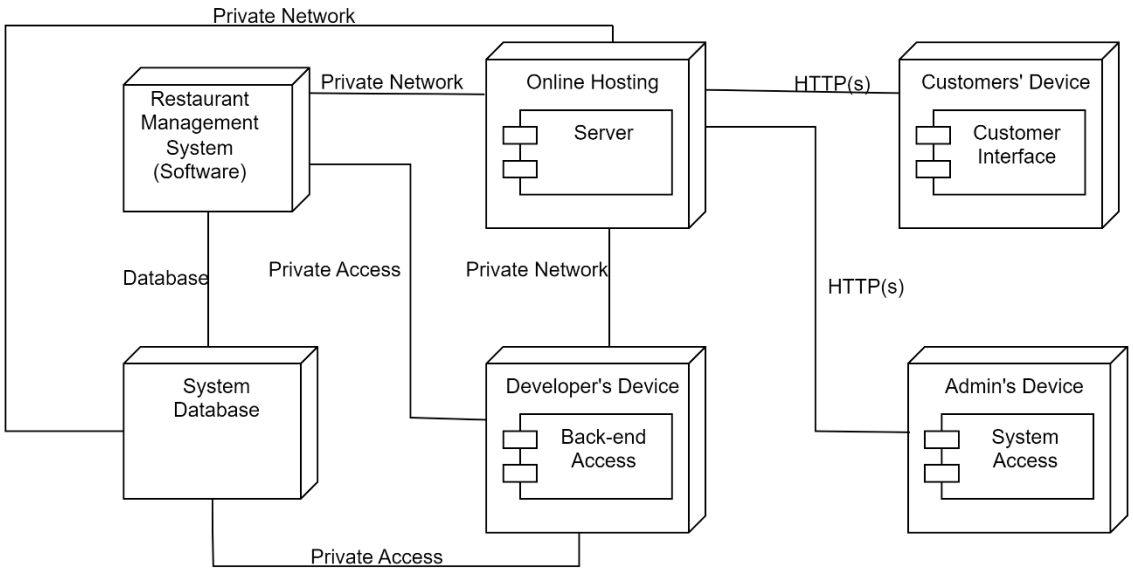

Figure 4:7Deployment Diagram

4.2 Algorithm Details

We are using decision tree algorithms in restaurant management systems for food tracking in order to identify whether the order has been placed to the customer or not. To use a decision tree algorithm to track whether the food had been placed to the customer or not, we need a dataset containing features that may affect the delivery process such as the order time, order items, order id, and more. We also need a label column indicating whether the food has been delivered or not for each record in the dataset. Once we have identified the relevant information, we can follow these steps:

1. Collect a dataset that includes information on food items like order status, order id, order time, order items, and other more features.
2. Use the dataset to train a decision tree model. Based on the characteristics we have established, the model will learn the patterns that distinguish between prepared and unprepared food items.
3. Once the model has been trained, we can use it to predict whether a new food item in an order has been prepared or not.
4. Finally, we would update the status of the food item in the inventory.

Here's an example of how the decision tree is applied to work in our system:

Enter Your Ordered Id and Email to track your order

Status of the order?

Ordered item placed to cook and serve accordingly -----> Your ordered have been placed

Ordered item not placed to cook and serve accordingly ----> Your ordered item have not been placed

Order items details ----> Order items details

5. Chapter 5: Implementation and Testing

5.1 Implementation

The implementation of a restaurant management system involves analyzing the requirements, designing and developing the system, testing it for bugs and errors, deploying it on the server or cloud-based platform, training the staff, and providing ongoing maintenance and upgrades. A structured and methodical approach is required to ensure the successful development and deployment of the system and to meet the needs of the restaurant.

5.1.1 Tools Used

Technologies:

- Django
- Python
- Bootstrap
- HTML
- CSS

Tools:

- Atom Text Editor

5.1.2 Implementation Details of Modules

The system consists of 4 basic modules and implementation is done using Django.

- **User Module:**
  The main aim of the User Module is to provide all the functionality related users. It tracks all the information of the customers. We have developed all type of operations of the customers. This is role-based module where admin can perform each and every operation on data but customer only view his/her data, so access level restrictions have also been implemented on the project.

- **Product Module:**

  The main purpose for developing the Product Module is to manage products category wise. All product will be managed by admin and customer will be able to see product and buy them. Admin can see the list, change product details and also add or delete products.

- **Order Module:**

  The main aim of the Order Module is received all order details and display them. It is designed to be used only by restaurant employees (and admin), and provides the following functions:

  i. Retrieve new orders from the database and display the orders in an easily readable, graphical way. Under "View Order" a customer will be able to see only his/her order.

- **Order Status Update Module:**

  The main aim of this Module is updated all information related to order. Admin or employee can change or add order status. Customer only see his/her order status details. Under "Tracker" a customer will be able to see his/her order all status details.

5.2 Testing

A detailed test plan should be developed to guide the testing process, and test reports should be generated to document the results of each testing phase. The project report should include a summary of the testing process, including methodology, results, and issues identified and resolved.

5.2.1 Test Cases for Unit Testing

Unit testing is the testing of an individual unit or group of related units. It is often done by the programmer to test that the unit he has implemented in producing expected output against given input. Following unit test cases were performed:

i. Sign In Test Case

Test Case ID	Test Scenario	Test Steps	Expected Result	Actual Result	Status
1.	Check sign in activity with valid data	i.Open app and go to sign in activity ii.Fill up the form iii.Click sign in button	Redirect user to the main activity of the app	User login successful and main activity load	Pass
2.	Check sign in activity with invalid data	i.Open app and go to sign up activity ii.Fill up the form with invalid data iii.Click sign in button	User should get respective error message	User login unsuccessful	Pass

Table 1: Sign in Test Case

ii. Add To Cart Test Case

Test Case ID	Test Scenario	Test Steps	Expected Result	Actual Result	Status
3.	Check Cart valid data	i.Click on products details ii.Click add to cart button	Product should be added to user's cart	Product is added to user cart	Pass
4.	Check Cart with invalid data	i.Click on products details ii.Click add to cart button	Product should not be added to user's cart	Product is not added to user cart	Pass

Table 2: Add To Cart Test Case (Post Test Case)

iii. Logout Test Case

Test Case ID	Test Scenario	Test Steps	Expected Result	Actual Result	Status
5.	Logging out from the app	i.User press Logout button	User should be redirected to sign in page and session should be destroyed	User is redirected to login page	Pass

Table 3: Logout Test Case

5.2.2 Test Cases for System Testing

System Testing is the testing of a complete and fully integrated software product. Following system testing were performed:

Test Case ID	Test Scenario	Test Steps	Expected Result	Actual Result	Status
6.	Testing Final System	Test if each and every Modules are coordinating properly or not	The app should work properly	Application is working properly	Pass

Table 4: System Testing

5.3 Result Analysis

The system provides a thorough analysis of the system's conception, creation, and application. The solution dramatically increases operational effectiveness, decreases errors, and boosts customer satisfaction, according to tests. The system's test also demonstrates that by automating tasks like ordering, billing, inventory management, and employee management, operating expenses have been decreased, resource management has been improved, and customer satisfaction has increased.

6. Chapter 6: Conclusion and Future Recommendations

6.1 Conclusion

After carefully analyzing our work, we have come to the conclusion that the system now functions as intended after numerous tweaks. Numerous changes and enhancements can yet be added to the project. However, our team worked diligently and continuously over the allotted time, and as a result, we believe the project's overall results to be satisfactory. The report covers the whole project's timeline and provides results where they are necessary.

In conclusion, a complete system for effectively managing restaurant operations exists in the restaurant management system. The system's conception, design, and use show how it can improve customer happiness and streamline restaurant operations. The system is a workable option for restaurants of all sizes because of its scalability, adaptability, and security features. The project report demonstrates that the restaurant management system can have a favorable effect on the restaurant business by enhancing operational effectiveness and minimizing mistakes. The system can continue to develop and adapt as long as technology does, in order to satisfy changing market demands. The restaurant management system has the ability to completely change how restaurants run their business and enhance the diner experience.

6.2 Future Recommendations

The following section describes the work that can be implemented with future releases of the software:

- **Customize orders:** Allow customers to customize food orders
- **Enhance User Interface by adding more user interactive features:**
    i. Provide Deals and promotional Offer details to home page.
    ii. Provide Recipes of the Week/Day to Home Page.
- **Payment Options:**
    i. Add different payment options such as PayPal, Cash, Gift Cards etc.
    ii. Allow to save payment details for future use.
    iii. Allow to process an order as a Guest
- **Order Process Estimate:** Provide customer a visual graphical order status
- **Restaurant Locator:** Allow to find and choose a nearby restaurant

7. References

[1] E. Staff, “Restaurant Management System - all features and components,” Webpreneur Lab, 21-Feb-2022. [Online]. Available: https://webpreneurlab.com/restaurant-management-system/. [Accessed: 27-Feb-2023].

[2] Tan and Guest, “Top 7 restaurant software in Nepal,” Trending Net Nepal, 06-Oct-2021. [Online]. Available: https://www.trendingnetnepal.com/restaurant-software-in-nepal/. [Accessed: 27-Feb-2023].

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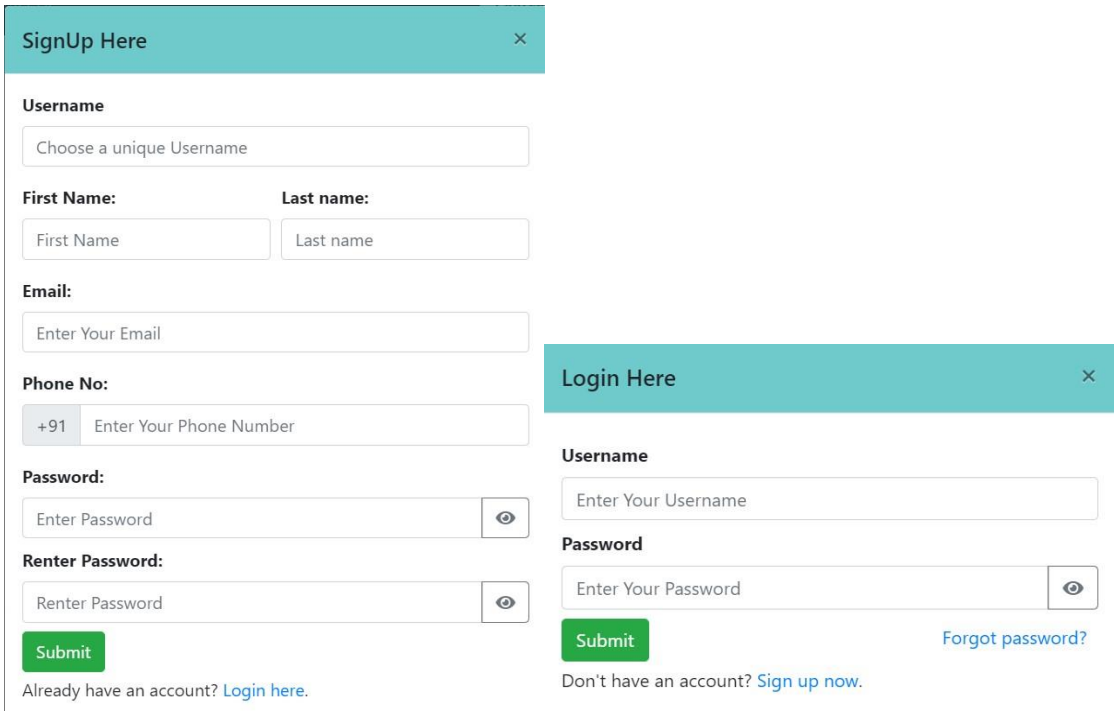
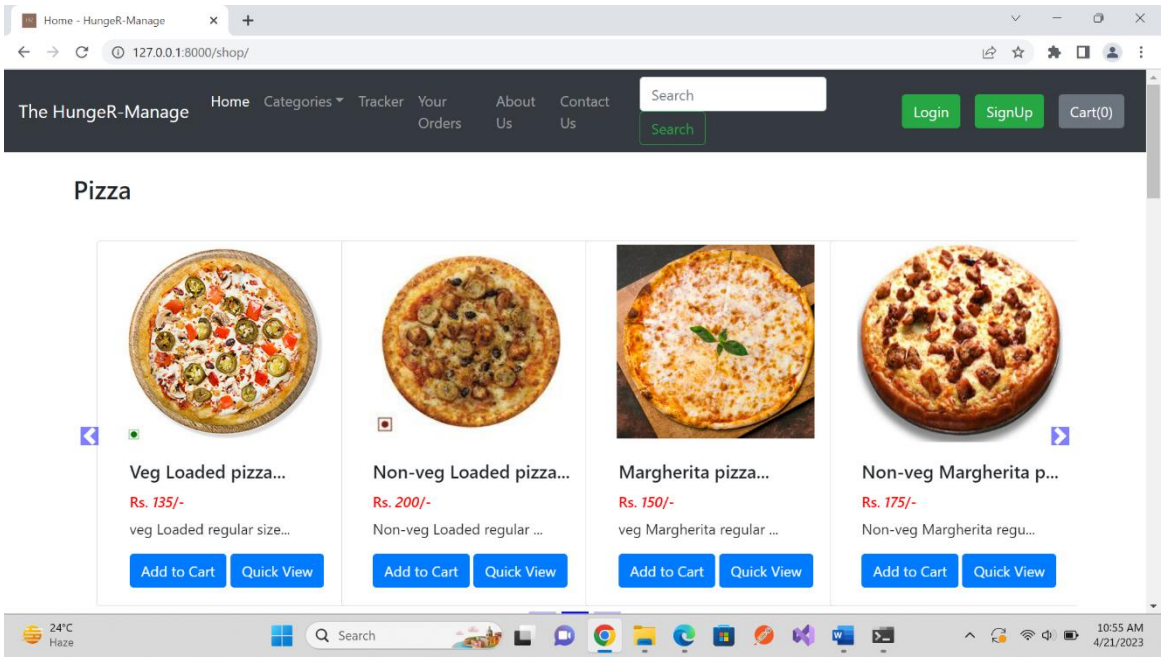
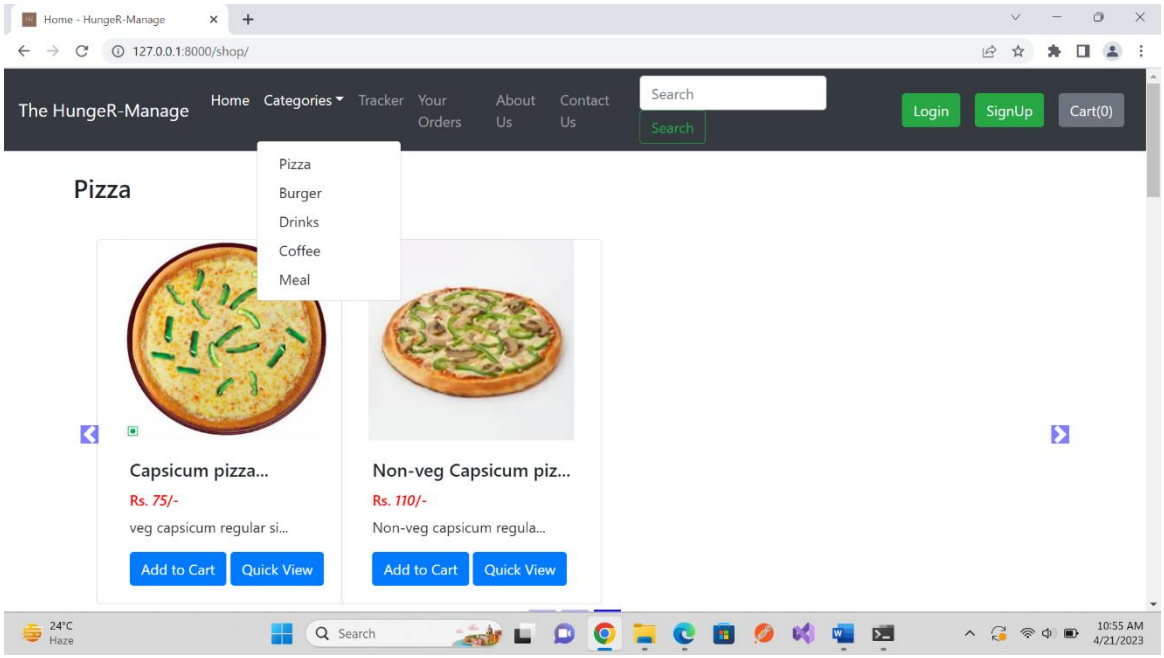
8. Appendices



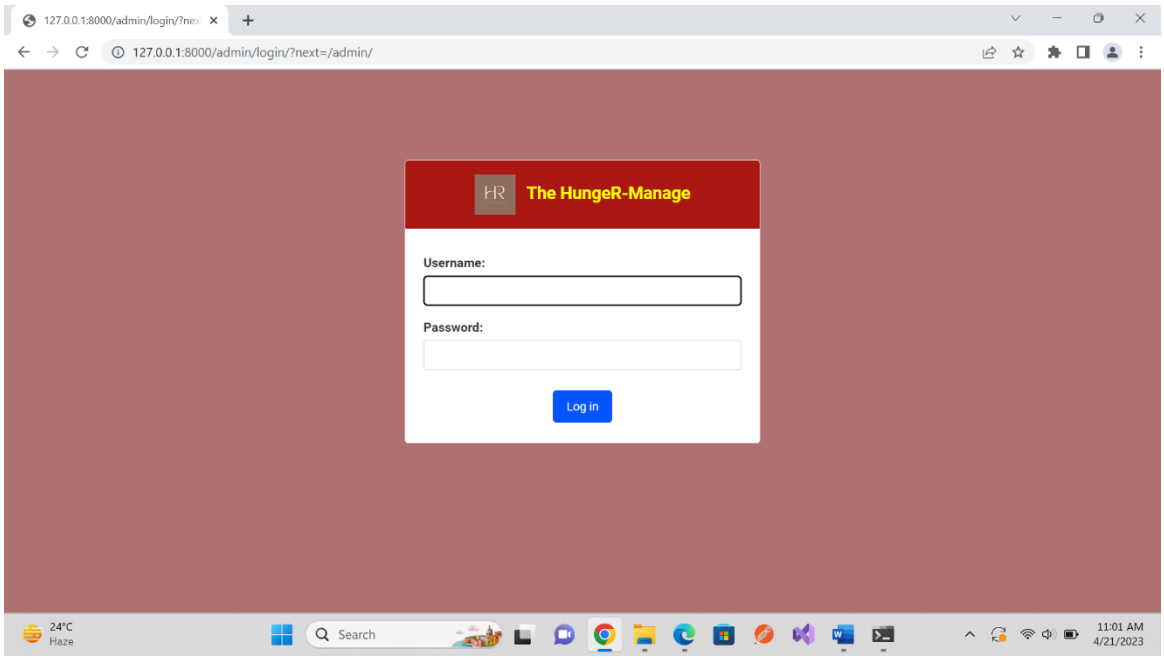
Login and Sign Up



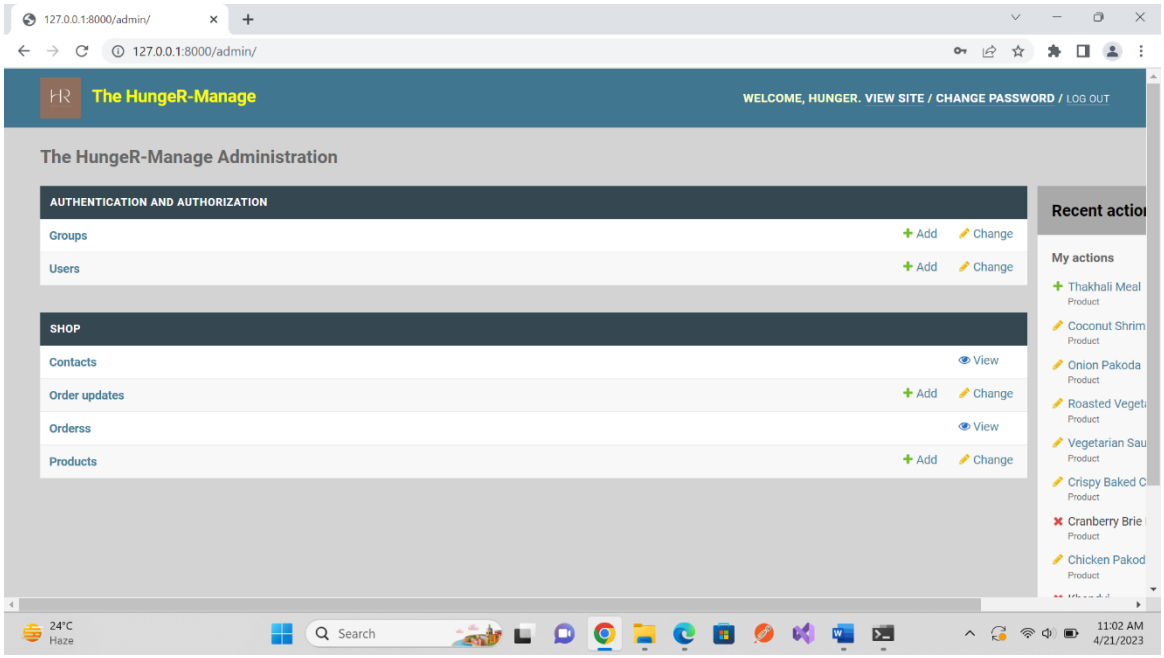
Home Page



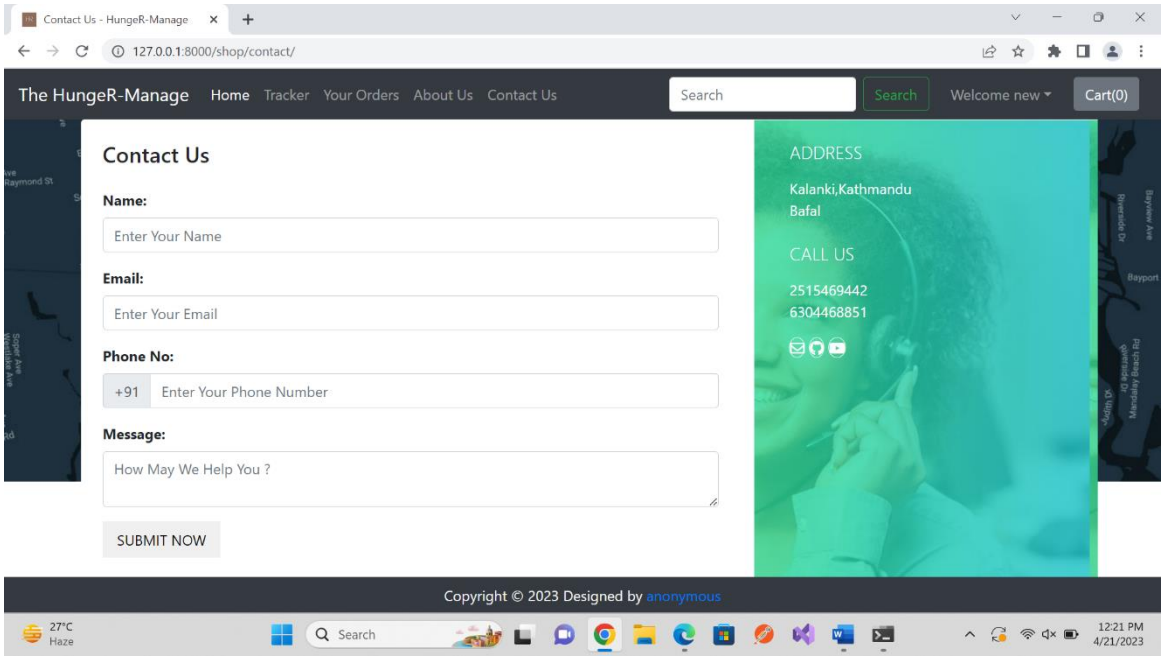
Category



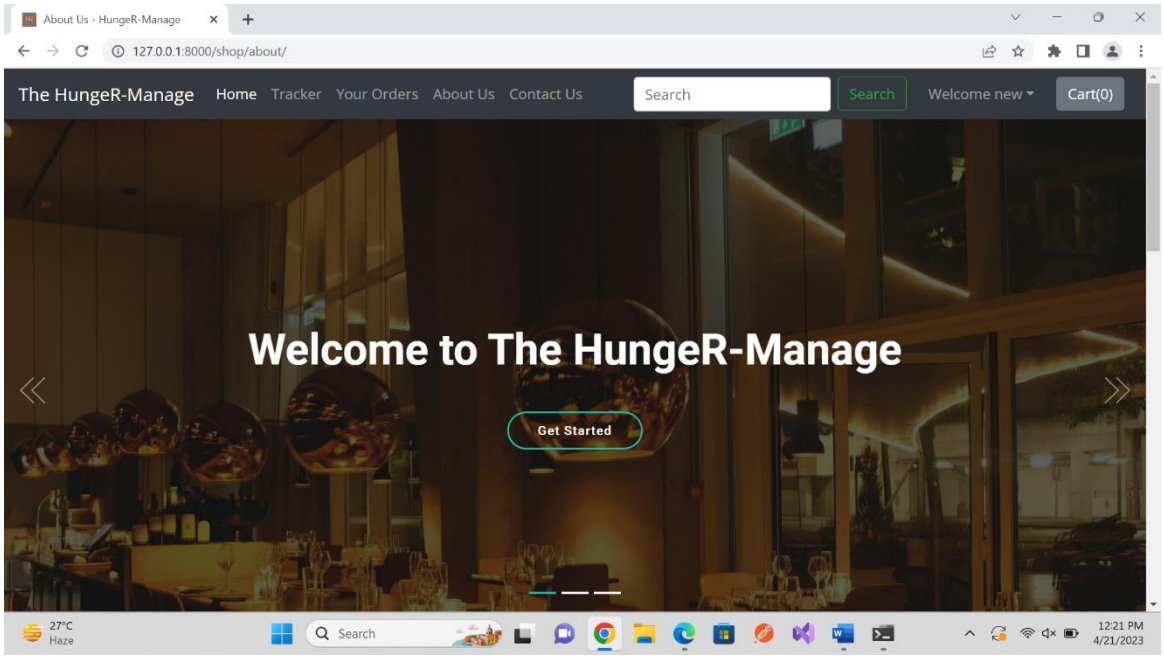
Admin Login



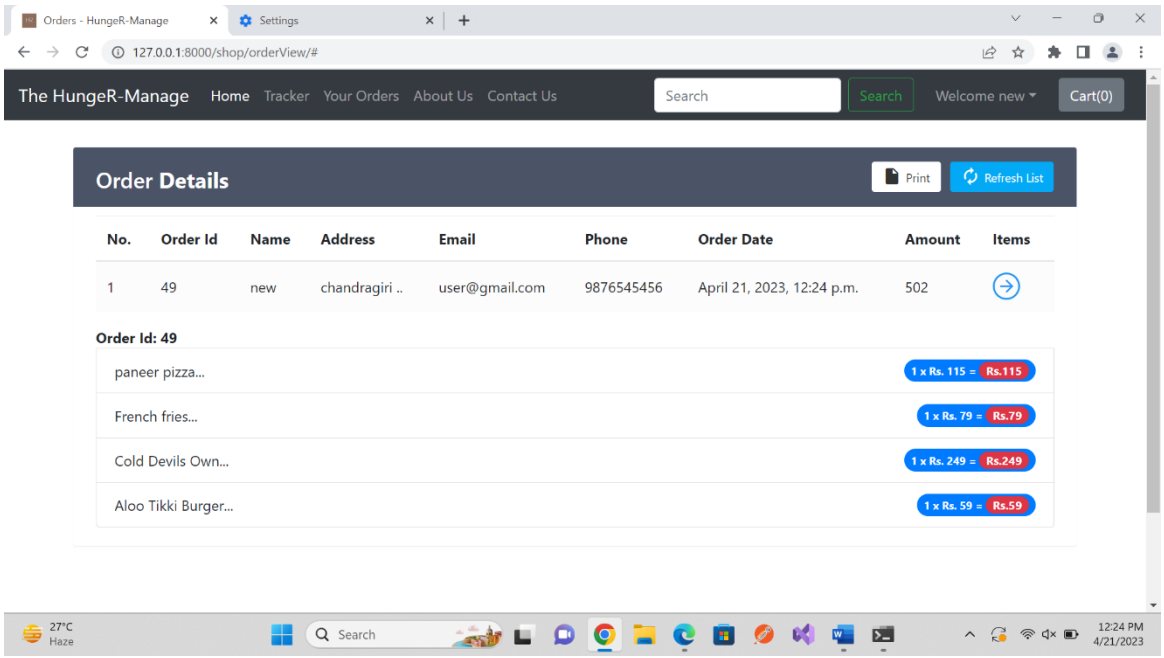
Admin Dashboard



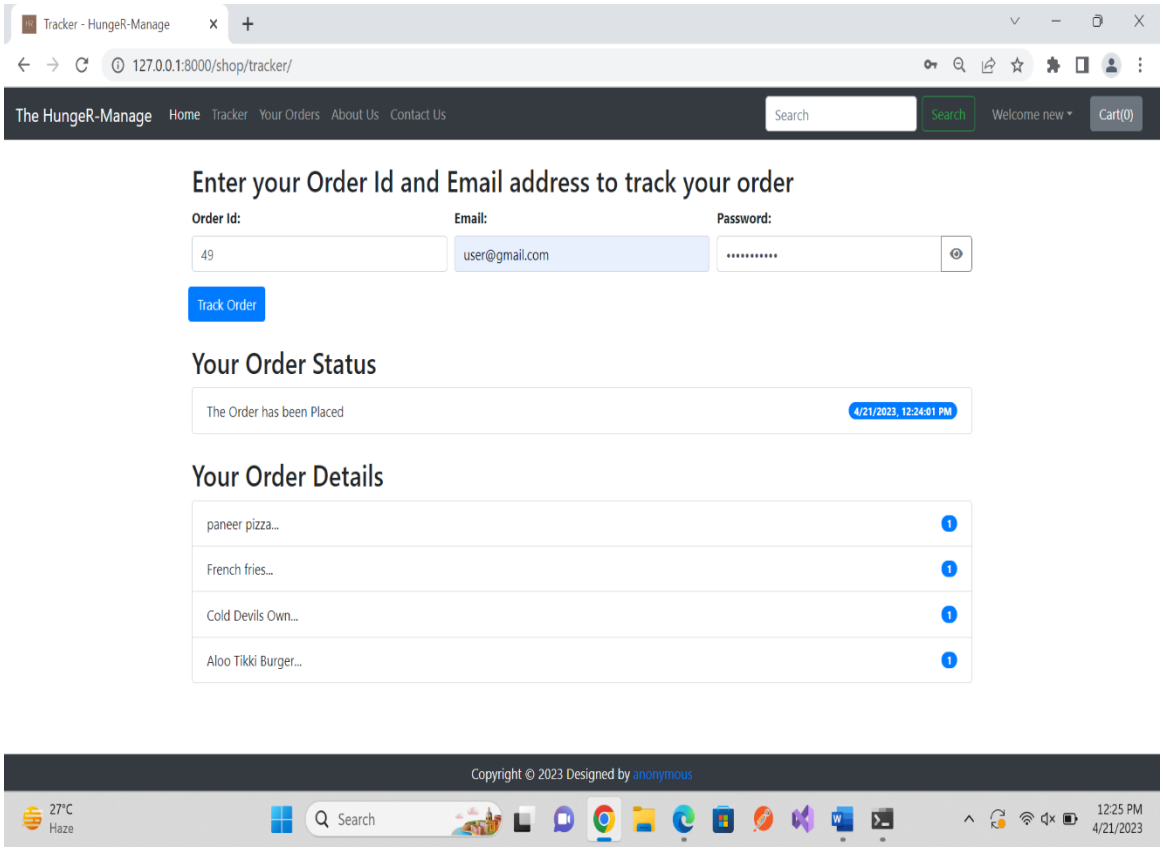
Contact Us Page



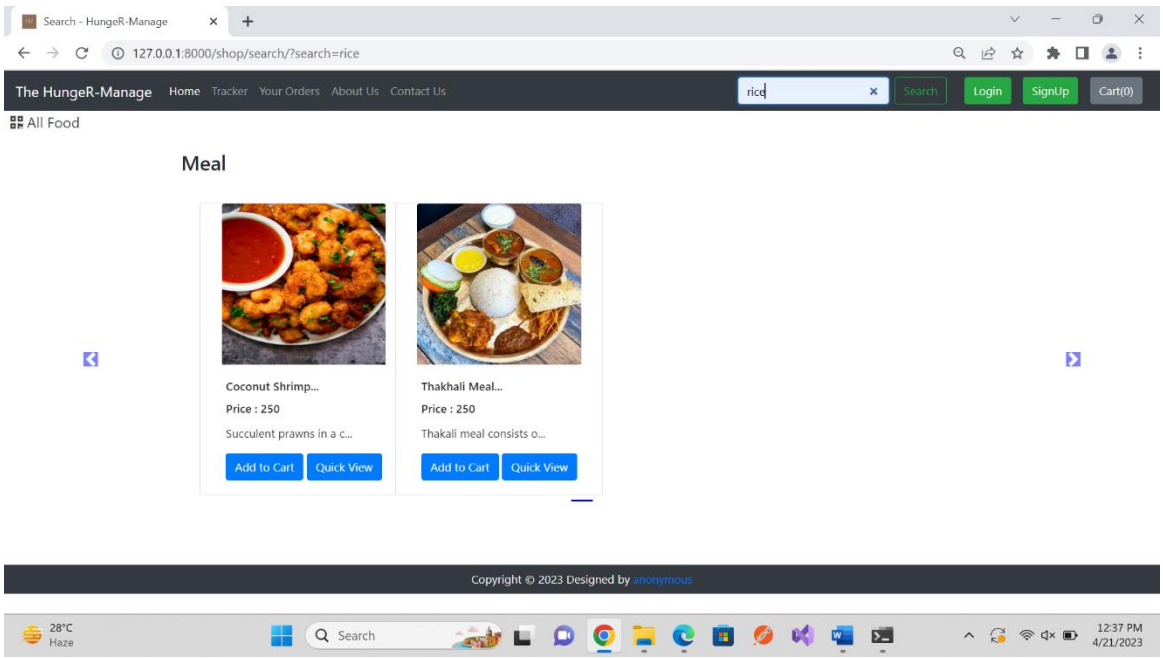
About Us Page



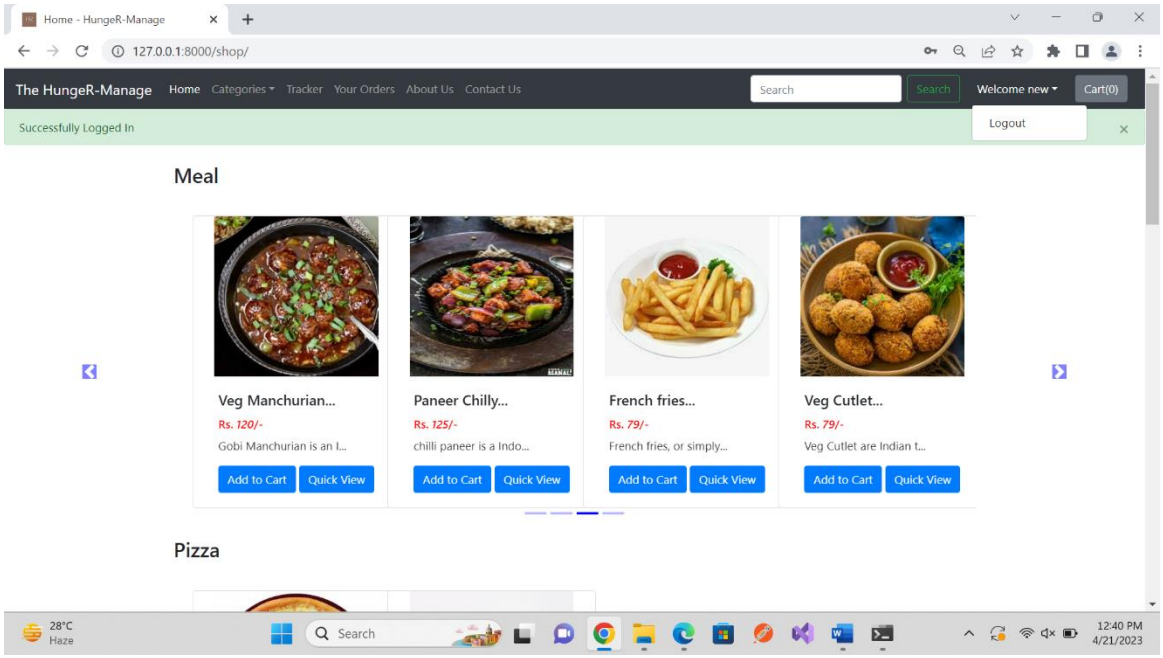
Order Details



Order Tracker Page



Search Page


Home - HungeR-Manage
127.0.0.1:8000/shop/
The HungeR-Manage
Home
Categories
Tracker
Your Orders
About Us
Contact Us
Search
Search
Welcome new
Cart(0)
Logout
Successfully Logged In
Meal
Veg Manchurian...
Rs. 120/-
Gobi Manchurian is an I...
Add to Cart
Quick View
Paneer Chilly...
Rs. 125/-
chilli paneer is a Indo...
Add to Cart
Quick View
French fries...
Rs. 79/-
French fries, or simply...
Add to Cart
Quick View
Veg Cutlet...
Rs. 79/-
Veg Cutlet are Indian t...
Add to Cart
Quick View
Pizza
28°C
Haze
Search
12:40 PM
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