Project Report

on

Cafe Management System

Submitted by

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24MCC20027

Under the guidance of

Ms. Winky Bhatia

in partial fulfillment for the award of the degree of

MASTER OF COMPUTER APPLICATIONS

CLOUD COMPUTING & DEVOPS

Chandigarh University

Certificate

This is to certify that **Aakash Thapliyal**, a student of **Master of Computer Applications (MCA) – Cloud Computing and DevOps**, has successfully completed the **mini Project** titled **" Cafe Management System"** under the esteemed guidance of **Ms. Winky Bhatia , Assistant Professor, University Institute of Computing (UIC), Chandigarh University**.

This project was undertaken as a part of the academic curriculum and is submitted in **partial fulfilment of the requirements** for the MCA program. The work presented in this project is a result of **independent research, diligent effort, and dedication**, demonstrating the student's ability to apply theoretical knowledge to practical problem-solving.

I hereby confirm that this project is an **original work** carried out by the student and has **not been submitted elsewhere** for the award of any other degree, diploma, or certification.

Project Guide:
Ms. Winky Bhatia
Assistant Professor
University Institute of Computing
Chandigarh University

Acknowledgement

I would like to express my sincere gratitude to **Chandigarh University** and the **University Institute of Computing (UIC)** for providing me with the opportunity to undertake this project, **Cafe Management System.**

I extend my heartfelt appreciation to my esteemed mentor, **Ms. Winky Bhatia , Assistant Professor**, for his invaluable guidance, continuous support, and insightful feedback throughout the project. His expertise in **Advance Internet Programming** played a crucial role in the successful completion of this project.

I am also grateful to my friends and peers for their encouragement and discussions, which helped refine my approach. Lastly, I thank my family for their unwavering support and motivation during this research.

This project has been an incredible learning experience, and I hope it serves as a foundation for further exploration in **Cafe Management System.**

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Cafe Management System

Introduction

In the modern age, automation has become a key factor in enhancing efficiency and improving customer experience across various industries. This project, titled "Cafe Management System," is a web-based application designed to automate and simplify the operations of a café or restaurant. The system provides an intuitive digital interface for both customers and staff, allowing them to manage orders, view the menu, track order history, and improve the overall process flow within the cafe.

This system is primarily aimed at reducing the time required for staff to manually manage orders and streamlining the ordering process for customers. The system is built with modern web technologies to ensure scalability, user-friendliness, and high performance.

Objective

The main objective of this project is to develop a web-based application that can automate various processes in a café, including:

- Allowing customers to browse the menu, place orders, and view order history.

- Enabling café staff to efficiently manage orders, track placed orders, and provide updates to customers.

- Reducing human errors in order management, thereby improving service quality and speed.

- Offering an easy-to-navigate interface that allows customers to have a seamless experience, both for browsing items and placing orders.

The system aims to bridge the gap between traditional manual order-taking systems and modern, automated solutions, offering benefits such as reduced operational costs, increased customer satisfaction, and improved efficiency for café management.

Technologies Used

This Café Management System leverages a combination of front-end and back-end technologies to deliver a responsive, scalable, and efficient solution. The following technologies were used:

- Frontend:

- JSP (Java Server Pages): Used for dynamically generating HTML pages based on user interaction.

- HTML: For creating the basic structure and content of web pages.

- CSS: For styling the web pages to improve the user experience.

- Bootstrap: For responsive design, ensuring the system is mobile-friendly and works across different devices and screen sizes.

- Backend:

- Java (Servlets): Used to handle the logic behind user interactions and process the flow of data from the user interface to the database.

- JDBC (Java Database Connectivity): Facilitates communication between Java applications and the PostgreSQL database, allowing the system to retrieve and store data such as orders, menu items, and customer information.

- Database:

- PostgreSQL: A powerful open-source relational database system used to store and manage all the data for the café, including menu items, customer information, orders, and order history.

- Server:

- Apache Tomcat: A Java-based web server and servlet container used to host and run the Café Management System.

- Development Tools:

- NetBeans IDE: Used for writing, testing, and debugging the code.

- pgAdmin: A PostgreSQL database management tool used to manage the PostgreSQL database and perform database-related tasks.

System Architecture

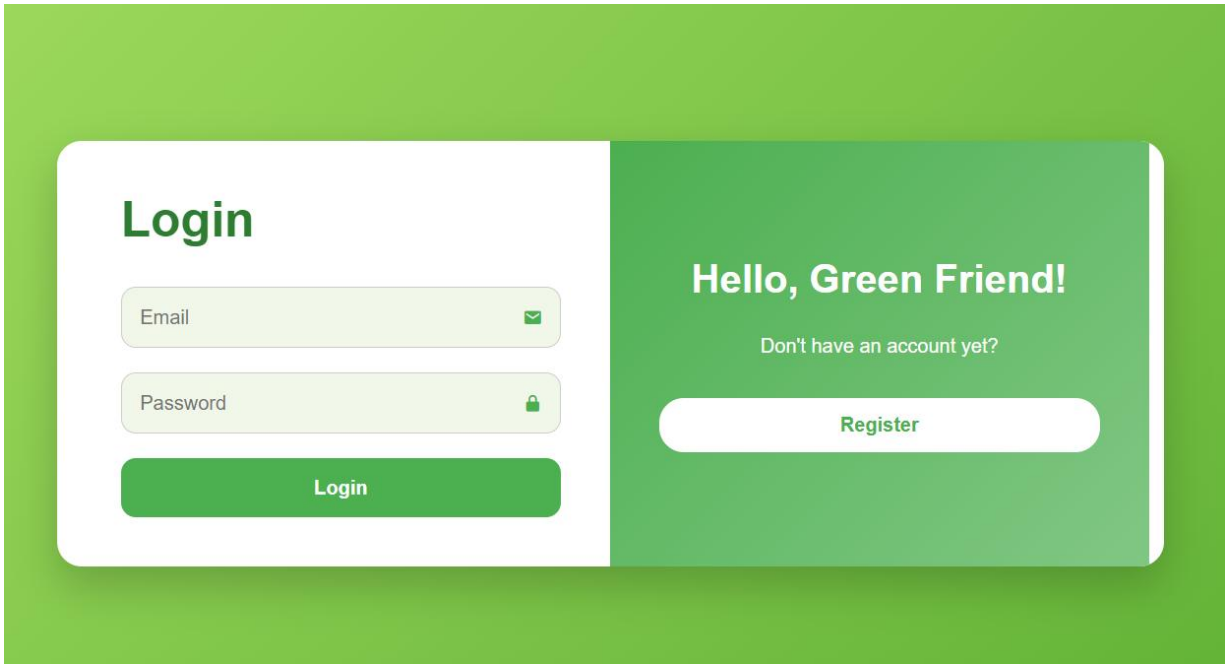
The Café Management System follows a simple 3-tier architecture:

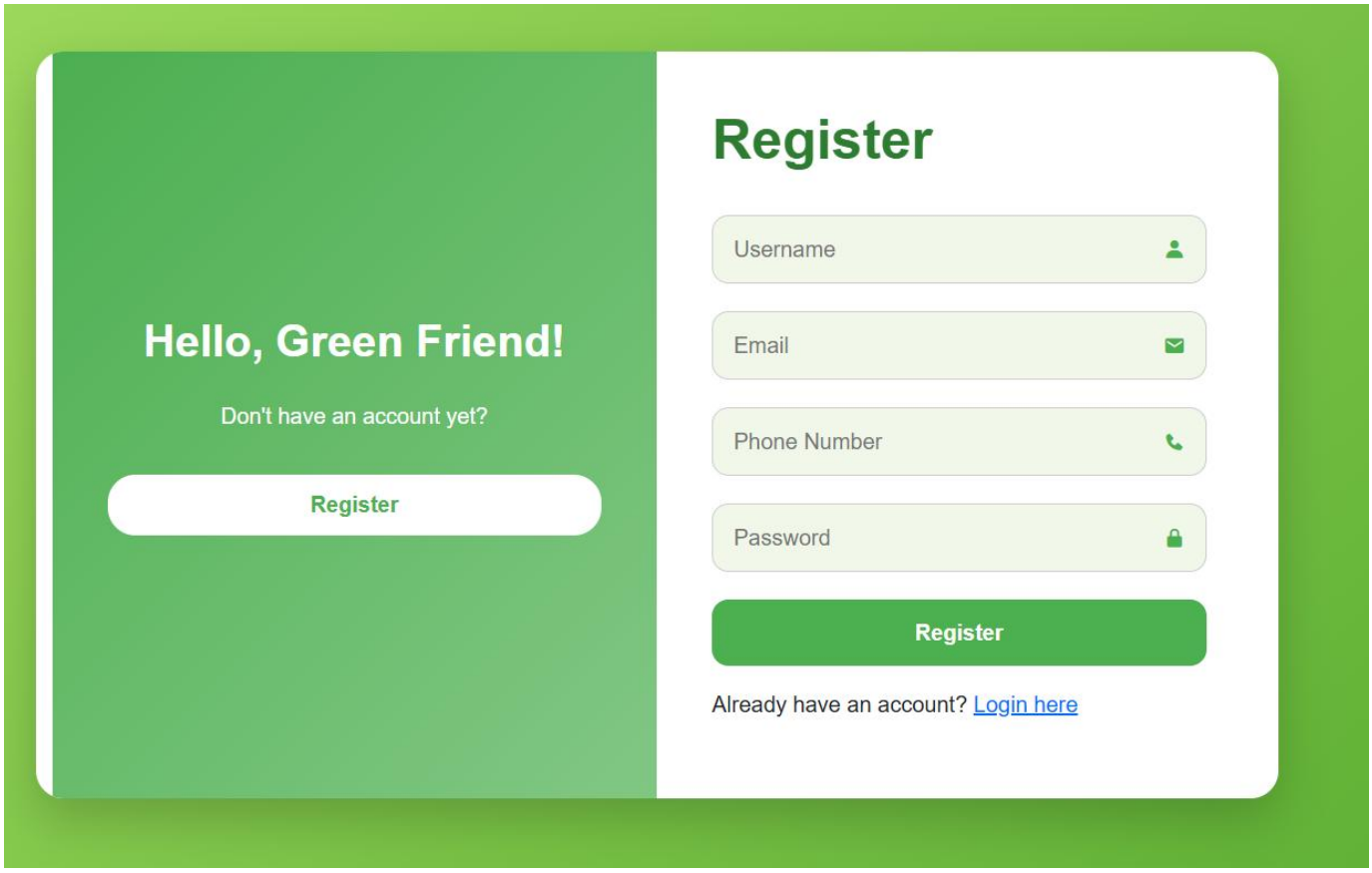
1. User Interface Layer: The front-end, which interacts directly with the user, is built using JSP, HTML, CSS, and Bootstrap.

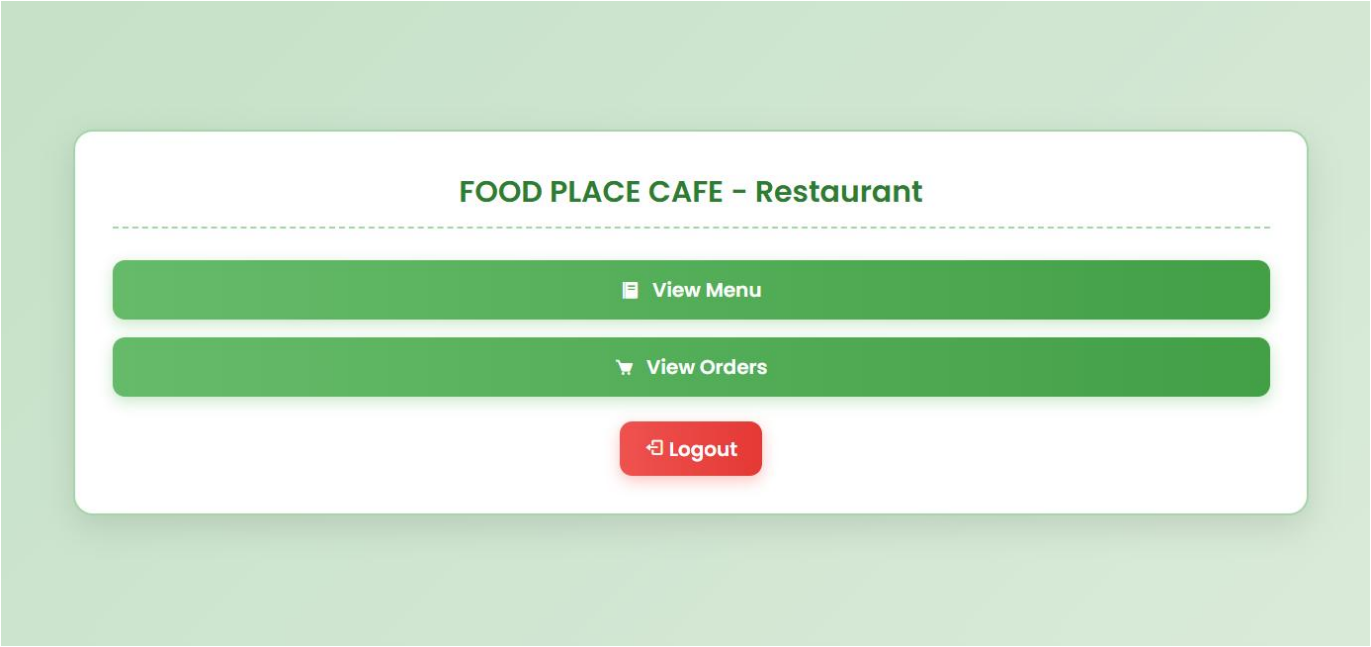
2. Business Logic Layer: The back-end of the system, which processes the logic and handles data flow between the user interface and the database, is implemented using Java Servlets.

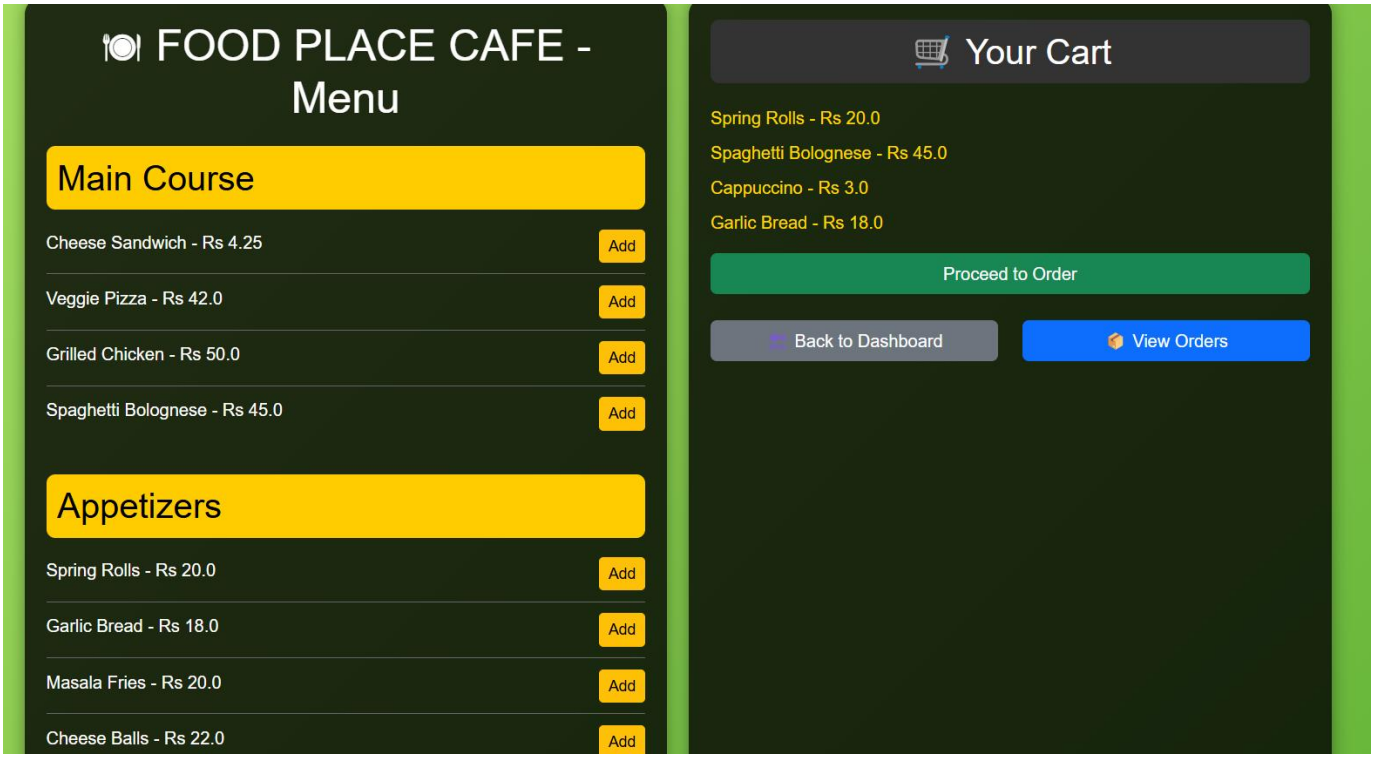
3. Data Layer: The database layer, where all the system's data (such as user orders, menu items, and customer information) is stored and managed using PostgreSQL.

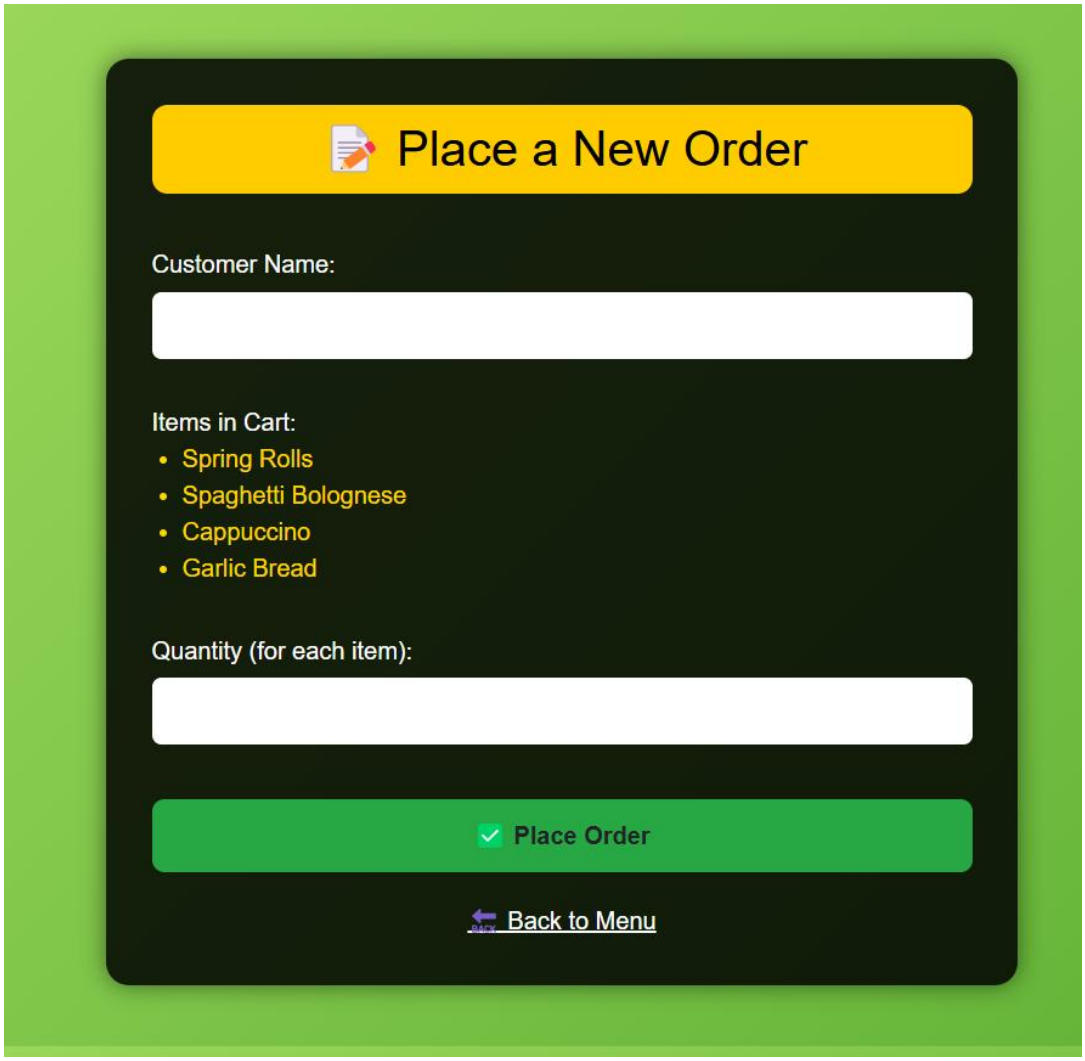
Screenshots

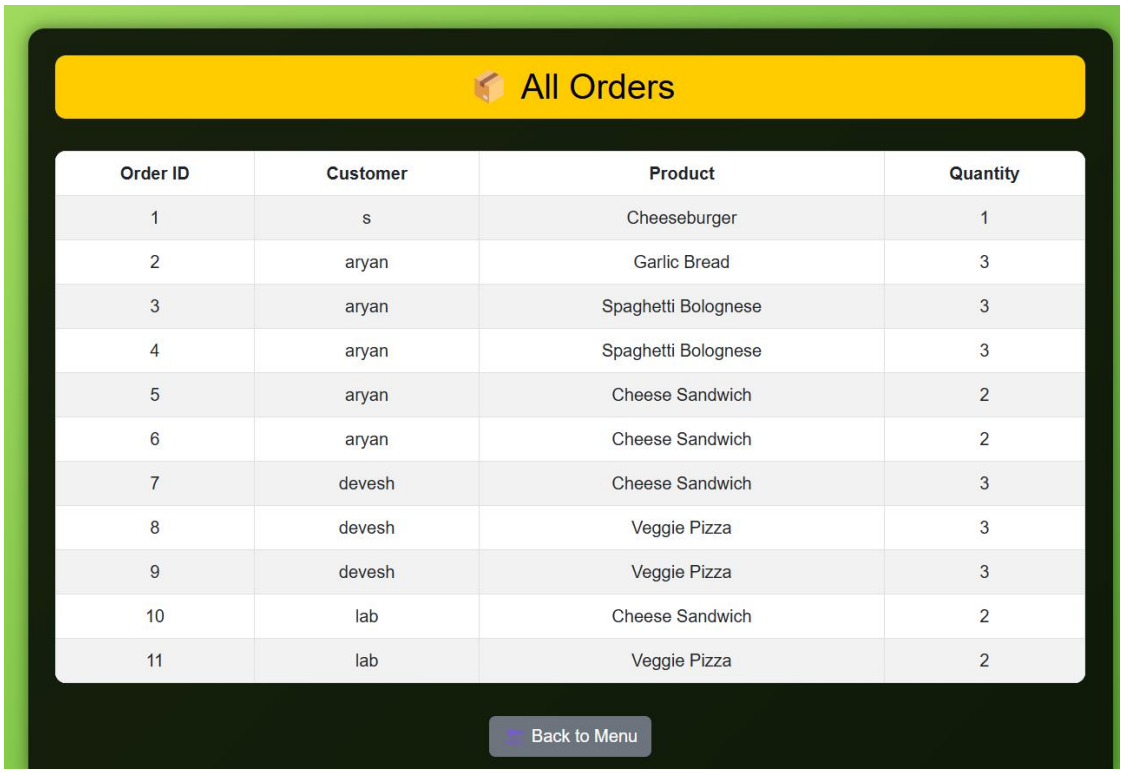





FOOD PLACE CAFE - Restaurant
View Menu
View Orders
Logout


FOOD PLACE CAFE - Menu
Main Course
Cheese Sandwich - Rs 4.25
Add
Veggie Pizza - Rs 42.0
Add
Grilled Chicken - Rs 50.0
Add
Spaghetti Bolognese - Rs 45.0
Add
Appetizers
Spring Rolls - Rs 20.0
Add
Garlic Bread - Rs 18.0
Add
Masala Fries - Rs 20.0
Add
Cheese Balls - Rs 22.0
Add
Your Cart
Spring Rolls - Rs 20.0
Spaghetti Bolognese - Rs 45.0
Cappuccino - Rs 3.0
Garlic Bread - Rs 18.0
Proceed to Order
Back to Dashboard
View Orders


Place a New Order
Customer Name:
Items in Cart:
Spring Rolls
Spaghetti Bolognese
Cappuccino
Garlic Bread
Quantity (for each item):
Place Order
Back to Menu


All Orders
Order ID
Customer
Product
Quantity
1 s Cheeseburger 1
2 aryan Garlic Bread 3
3 aryan Spaghetti Bolognese 3
4 aryan Spaghetti Bolognese 3
5 aryan Cheese Sandwich 2
6 aryan Cheese Sandwich 2
7 devesh Cheese Sandwich 3
8 devesh Veggie Pizza 3
9 devesh Veggie Pizza 3
10 lab Cheese Sandwich 2
11 lab Veggie Pizza 2
Back to Menu

Data Flow Diagram (DFD)

The Data Flow Diagram (DFD) illustrates how data flows through the different modules of the Café Management System:

1. Login and Registration:

- The user can either log in or register as a new customer using the login_register.jsp page.

- After successful authentication, the user gains access to the menu and order management features.

2. Viewing the Menu:

- The user accesses the menu.jsp page, which displays the menu items. These items are retrieved from the PostgreSQL database.

3. Cart Management:

- Customers can select items from the menu, which are then added to their cart. This is managed through sessions in the menu.jsp.

4. Placing an Order:

- Once the customer has reviewed their cart, they proceed to order_form.jsp to finalize and place the order. The order details are sent to the server via the AddOrderServlet for processing.

- The order is then saved in the database.

5. Viewing Orders:

- Both customers and admins can view the list of placed orders on the order.jsp page. This page retrieves order information via the ViewOrdersServlet.

6. Database Interaction:

- All interactions, such as viewing the menu, adding items to the cart, placing orders, and retrieving order history, are stored in and retrieved from the PostgreSQL database.

Future Enhancements

While the current system successfully meets its objectives, there are several future enhancements that could be integrated to further improve functionality and user experience:

- Admin Panel:

- An admin panel could be introduced to allow café managers or admins to easily add, edit, or remove menu items without the need for manual database changes.

- Payment Gateway Integration:

- Integration with payment gateways (like PayPal or Stripe) would allow customers to make payments directly through the website, further streamlining the ordering process.

- Order Status Tracking:

- Customers could receive updates on the status of their orders (e.g., "Order received," "Preparing," "Ready for pickup"), enhancing customer satisfaction.

- Role-Based Access Control:

- Different user roles, such as customers, admins, and staff, could be assigned different levels of access to specific functionalities in the system.

- SMS/Email Notifications:

- The system could send SMS or email notifications to customers confirming their orders, estimated delivery times, and other relevant updates.

Challenges Faced

During the development of this system, several challenges were encountered and overcome:

- Session Management:

- Ensuring proper management of user sessions, especially when customers added items to the cart and placed orders, was a critical part of the development process. This was handled using Java sessions to store cart data and ensure smooth transactions.

- Database Optimization:

- Efficient database queries were crucial to retrieve menu items, customer orders, and order history quickly, especially with a growing number of records. Proper indexing and optimization of SQL queries helped in improving performance.

- User Interface Design:

- Designing a responsive and intuitive user interface that worked well across different devices was initially a challenge. However, the use of Bootstrap allowed for creating a responsive and attractive layout.

Conclusion

The Cafe Management System successfully demonstrates the application of modern web technologies to automate and streamline the processes involved in managing a café or restaurant. With features such as easy order management, a user-friendly interface, and potential future enhancements, the system serves as a solid foundation for real-world deployment in a café or similar business. The project not only highlights the importance of automation in reducing operational overhead but also provides a scalable solution for future enhancements and integrations.

This project serves as a valuable tool for café management, helping both customers and staff experience smoother, faster, and more efficient operations. The continued evolution of the system, with additional features and updates, could further enhance the overall functionality and user experience, offering significant benefits to café businesses.