Project Report_02
Project Title : Cafeteria Management System (Class Diagram)

Date : 11. 03. 2025

Submitted to :

Khandoker Nosiba Arifin
Lecturer, Dept. of CSE.
Faculty of Science & Engineering (UITS)
Course Code : CSE 356
Course title : Software Engineering and System Analysis Lab

Submitted by :

Amirul Alam
ID : 04324205101171
Section : 6C2

Experiment No: 02

Experiment Name: Cafeteria Management System (Class Diagram)

Objectives:

The primary objectives of this project are:

- To design and implement a digital **Cafeteria Management System** for efficient order processing and billing.
- To automate inventory management, ensuring stock levels are monitored in real time.
- To provide a user-friendly interface for customers, allowing them to place orders with ease.
- To enhance the efficiency of cafeteria staff by streamlining order fulfillment and reducing errors.
- To generate reports for sales tracking, helping management make informed decisions.

Apparatus Required:

To develop and implement the system, the following hardware and software tools are required:

Hardware:

- Computer/Laptop with sufficient processing power
- Server (optional for deployment)
- Networking devices (if required)

Software:

- **Programming Languages:** HTML, CSS, JavaScript ,Next.js/Node.js/Python
- **Database Management System:** MySQL or PostgreSQL or MongoDB
- **Development Environment:** VS Code
- **Server Environment:** XAMPP/WAMP for local hosting
- **Other tools:** GitHub for version control, API integrations for payment processing (if needed)
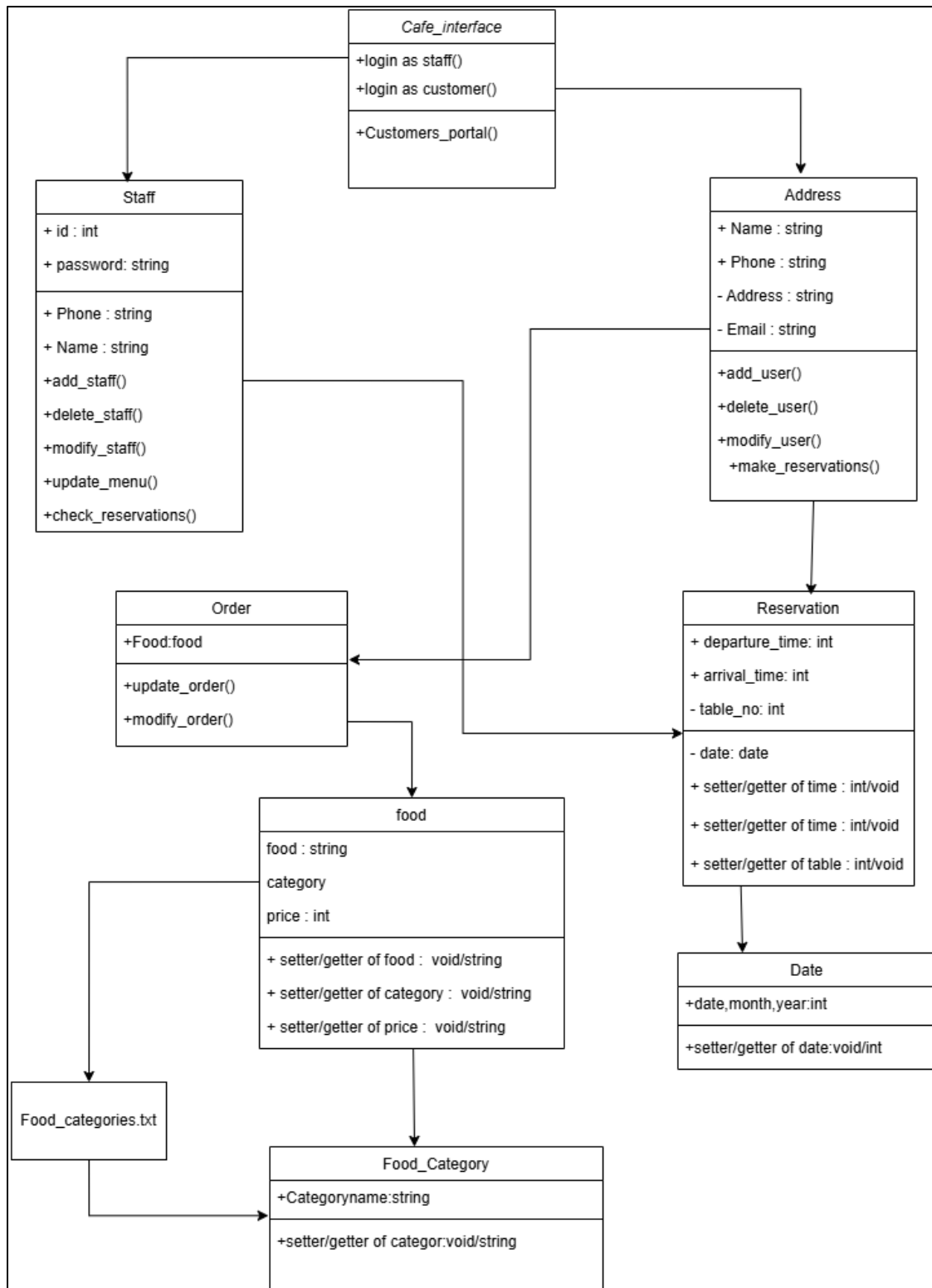
Theory:

A **Cafeteria Management System** is a web-based or application-based solution designed to automate cafeteria operations such as order management, billing, and inventory tracking. Traditional cafeteria management relies heavily on manual processes, which can be time-consuming and prone to errors. The digital system aims to eliminate inefficiencies by introducing automation in the following areas:

1. **Order Processing:** Customers can place orders through a digital interface (self-service kiosk or mobile/web application), and the system processes them automatically.
2. **Billing System:** The software generates bills automatically based on the selected menu items and applied discounts or taxes. Payment can be made via cash, card, or digital wallets.
3. **Inventory Management:** The system tracks stock levels in real time, sending alerts when certain ingredients or items are running low. This prevents shortages and ensures smooth operations.

4. **User Management:** The system supports multiple user roles, including customers, cafeteria staff, and administrators. Admins can monitor daily sales, manage users, and generate reports.

5. **Report Generation:** Sales reports, stock usage reports, and customer data analytics help in making data-driven business decisions.

Diagram:

- ### Class Diagram

Cafe_interface
+login as staff()

+login as customer()

+Customers_portal()

Staff
+ id : int

+ password: string

+ Phone : string

+ Name : string

+add_staff()

+delete_staff()

+modify_staff()

+update_menu()

+check_reservations()

Address
+ Name : string

+ Phone : string

- Address : string

- Email : string

+add_user()

+delete_user()

+modify_user()

+make_reservations()

Order
+Food:food

+update_order()

+modify_order()

Reservation
+ departure_time: int

+ arrival_time: int

- table_no: int

- date: date

+ setter/getter of time : int/void

+ setter/getter of time : int/void

+ setter/getter of table : int/void

food
food : string

category

price : int

+ setter/getter of food : void/string

+ setter/getter of category : void/string

+ setter/getter of price : void/string

Date
+date,month,year:int

+setter/getter of date:void/int

Food_categories.txt

Food_Category
+Categoryname:string

+setter/getter of categor:void/string

Result and Discussion:

After implementing the **Cafeteria Management System**, the following observations were made:

- **Improved Order Efficiency:** Orders are processed faster compared to traditional manual methods. The system reduces the chances of miscommunication between customers and staff.
- **Reduced Errors:** Automation minimizes billing and inventory errors, ensuring a smoother operation.
- **Enhanced Customer Experience:** Customers benefit from faster order placement and reduced wait times. Online ordering options further add to convenience.
- **Better Inventory Control:** Real-time tracking of stock levels ensures that ingredients are available when needed, reducing waste and preventing shortages.
- **Data-Driven Insights:** Reports generated by the system help management track sales trends, peak hours, and menu preferences, allowing for better decision-making.

Overall, the system proves to be a significant improvement over traditional cafeteria management methods, enhancing both efficiency and customer satisfaction.

Conclusion:

The **Cafeteria Management System** successfully automates and optimizes various cafeteria operations, making them more efficient and reliable. The system improves order processing, reduces manual work, and ensures accurate billing and inventory management.

In the future, additional features such as **AI-powered order recommendations, mobile application support, and integration with third-party food delivery services** could further enhance the functionality of the system. The project demonstrates the importance of digital transformation in improving service efficiency and customer satisfaction in a cafeteria environment.