Restaurant Ordering System

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Introduction:

The Restaurant Ordering
System is a software application designed to streamline the process of menu management, order placement, and billing in a restaurant. This project will utilize Object-Oriented Programming (OOP) principles to create a user-friendly and efficient system that caters to the needs of customers, restaurant staff, and management.

Objectives:

1. To develop a robust system that simplifies menu management, allowing the addition, deletion, and modification of menu items.
2. To create an efficient order placement module that captures customer preferences and generates accurate orders.
3. To implement a dynamic billing system capable of applying discounts and generating detailed invoices.

Scope:

The system will focus on the core operations of a restaurant:

- **Menu Management**: Adding, updating, and removing menu items categorized by type (e.g., appetizers, main courses, desserts, beverages).
- **Order Placement**: Taking customer orders, customizing items (e.g., extra toppings, special requests), and managing order status (e.g., pending, completed).
- **Billing**: Automatically calculating total amounts, applying discounts (e.g., loyalty, promotional), and generating printable receipts.

Key Features:.

1. **User-Friendly Interface**: A simple console or graphical interface for interacting with the system.
2. **Discount Application**: Polymorphism will allow the system to handle different types of discounts (e.g., percentage-based, flat-rate).
3. **Encapsulation**: Order details will be managed securely to ensure data integrity and prevent unauthorized access.
4. **OOP Design**: The project will be structured using well-defined classes and relationships, promoting modularity and code reuse.

OOP Concepts Utilized:

1. **Classes**:
    - Menu: Handles the list of items, including their names, categories, and prices.
    - Order: Manages customer orders, item quantities, and customization requests.
    - Customer: Stores customer details, including name and contact information.
2. **Polymorphism**:
    - Different methods for calculating bills, such as applying percentage-based discounts, flat discounts, or no discounts.
3. **Encapsulation**:
    - Securely manage order data, such as items ordered, quantities, and status, to ensure accuracy and prevent tampering.
4. **Inheritance**:
    - Base class for discounts, with derived classes for specific discount types (e.g., LoyaltyDiscount, SeasonalDiscount).

5. **Abstraction:**

    - Abstraction is used to abstact the inventory operation such as adding, updating and removing items.

Expected Outcomes:

By the end of the project, the Restaurant Ordering System will:

- Provide a seamless experience for menu updates and order placement.
- Ensure billing is accurate and dynamic, catering to different customer needs.
- Demonstrate effective use of OOP concepts to create a modular and scalable application.

Tools and Technologies:

- **Programming Language**: C++

Conclusion:

This project will not only provide a functional restaurant management solution but also serve as a demonstration of Object-Oriented Programming principles in action. It will be a valuable addition to restaurant operations and a showcase of programming skills.