Project Summary: Restaurant Order Management System:

The Restaurant Order Management System is a comprehensive application designed to streamline the operations of a restaurant. This system manages the menu, processes customer orders, and handles payments while adhering to the SOLID principles of object-oriented design. The project is structured into multiple classes, each with a specific responsibility, ensuring scalability, maintainability, and flexibility.

Key Features:

1. Menu Management:

- The system provides a dynamic menu where restaurant administrators can add or remove menu items.
- Each menu item contains details such as name, price, and category.

2. Order Processing:

- Customers can place orders by selecting items from the menu.
- Orders consist of multiple items and are associated with a specific customer.

3. Order Status Tracking:

- Orders have statuses like Pending, Preparing, Completed, and Cancelled to help manage the workflow.

4. Payment Handling:

- The system supports multiple payment methods, including Cash and Credit Card.
- Payment processing is handled via interfaces, allowing easy extension for additional payment methods in the future.

5.Discounts:

- Discounts can be applied to orders, enabling promotional offers and customer rewards.

6.Validation and Processing:

- The system validates orders to ensure they meet business rules (e.g., cannot place an empty order).
- An OrderProcessor class manages order validation and processing logic.

Project Structure:

The system is divided into the following main components:

1. Restaurant Class:

- Manages the menu and list of orders.

2.Menu and MenuItem Classes:

- Represent the restaurant's menu and individual menu items.

3.Order and OrderItem Classes:

- Handle customer orders and their associated items.

4.Customer Class:

- Stores customer details like name and contact information.

5.Payment Interface and Implementations:

- Defines a contract for payment processing, with implementations for CashPayment and CreditCardPayment.

6.OrderProcessor and OrderValidator Classes:

- Ensure that orders are valid and properly processed.

7.Discount Class:

- Applies discounts to the total order amount.

8.OrderStatus Enum:s

- Represents the various stages of an order.

Benefits:

Modular Design: Each class is focused on a single responsibility, making the system easy to understand and modify.

Scalability: The system can easily be extended to include additional features, such as online ordering or new payment methods.

Maintainability: By following SOLID principles, the project ensures that changes in one part of the system have minimal impact on others.

Use Case Scenario:

A customer places an order by selecting items from the menu.

The system validates the order and calculates the total cost.

The customer makes a payment using their preferred method.

The restaurant staff updates the order status as it progresses.

Discounts are applied if applicable, and a receipt is generated.

This project serves as a robust foundation for managing restaurant operations and can be adapted to meet the needs of various types of dining establishments.