

Restaurant Management System Documentation

1. Introduction:

The **Restaurant Management System** is a Java-based application that simulates restaurant operations. It manages key functions like **menu management**, **order processing**, **payment handling**, and **employee management**. The system follows **SOLID design principles** to ensure modularity, scalability, and maintainability.

2. SOLID Principles Applied:

The **Single Responsibility Principle (SRP)** is applied throughout the system, with each class focused on one specific function. For example, the Menu class is responsible only for managing the restaurant's menu items, while the Order class is responsible for processing customer orders. Similarly, the PaymentProcessor class focuses solely on payment processing.

The system also adheres to the **Open/Closed Principle (OCP)**, meaning it is open for extension but closed for modification. For example, new payment methods can be added without needing to change the existing payment processing code. This allows the system to grow without disrupting its existing functionality.

The **Liskov Substitution Principle (LSP)** is demonstrated in the way subclasses like Chef and Waiter extend the Employee class. These subclasses can be substituted wherever the Employee class is used, ensuring consistent behavior across the system.

Interface Segregation Principle (ISP) is maintained by having smaller, more specific interfaces like the Payment interface and the RefundablePayment interface. This ensures that classes only implement the methods they need, keeping them clean and focused on their responsibilities.

The **Dependency Inversion Principle (DIP)** is followed by making sure that the PaymentProcessor class depends on the abstraction of the Payment

interface, rather than specific implementations like CashPayment or CardPayment. This allows the system to easily adapt to new payment methods without changing the core logic of the system

3.Conclusion:

The **Restaurant Management System** provides a solid foundation for managing a restaurant's core operations. It handles menu management, order processing, payment processing, and employee management. The system's design, based on **SOLID principles**, ensures that it is modular, easy to maintain, and flexible enough to accommodate future enhancements.