Hotel Booking System Documentation

**Overview**

The Hotel Booking System is a Java-based application that facilitates room bookings in a hotel. It employs various design patterns to streamline the booking process, manage hotel operations, and coordinate different functionalities seamlessly.

Features

* Room Booking: Allows users to book rooms based on availability and pricing strategies.
* Payment Handling: Integrates a third-party payment system using an adapter pattern.
* Enhancements: Utilizes the decorator pattern to add extra features to room bookings.
* Observer Notifications: Notifies observers (clients) about room booking events using the observer pattern.
* Worker Management: Utilizes the factory pattern to create and manage different types of hotel workers.

**Design Patterns**

Adapter Pattern

The system integrates a third-party payment system by using the PaymentAdapter class, which adapts the functionalities of the third-party payment system to work seamlessly within the hotel booking system.

Decorator Pattern

It enhances room bookings by allowing users to add extra features like breakfast or Wi-Fi to their bookings. The BreakfastDecorator and WifiDecorator classes dynamically add these features to room bookings without modifying the base HotelBookingSystem.

Observer Pattern

The system implements the observer pattern to notify clients about room booking events. Clients register as observers, and upon room bookings, they are individually notified about the booked rooms.

Factory Pattern

The factory pattern is used to create different types of hotel workers (Doorman, Maid, Chef). The WorkerFactory generates instances of these workers based on input, providing a convenient way to manage hotel staff.

Usage

The HotelManagementSystem class serves as the entry point for the application. It orchestrates the functionalities provided by different design patterns.

Room Booking

* Users can enter the amount of cash they have and select a room for booking.
* They can choose a pricing strategy and add extras like breakfast or Wi-Fi.
* If the cash amount covers the room price, the system books the room and notifies the observers.

Worker Management

* The WorkerFactory allows the creation of different workers (doormen, maids, chefs) based on user input.
* Workers perform their specific tasks (work() method) based on their roles.

Extensibility

* The system is designed to be easily extensible:
* Adding New Features: New features can be added by creating additional decorators.
* Including More Worker Types: Additional worker types can be incorporated by extending the WorkerFactory.

Conclusion

The Hotel Booking System demonstrates the effective utilization of various design patterns to provide a flexible, maintainable, and scalable solution for hotel room bookings and staff management.