Assignment 1- Java

Console-Based Hotel Management System

Your task is to design and implement a console-based Management Information System (MIS) for a **hotel**. The system should efficiently manage different types of rooms, guests, and the booking transactions between them. The program must be written in Java and should showcase your understanding of Object-Oriented Programming (OOP) principles such as **encapsulation, abstraction, polymorphism, inheritance, composition, and aggregation**.

Room Types:

Properties: Room Number, Room Type, Availability Status, Price, Amenities (Wi-Fi, AC, etc.)

- Single Room:
  - Features: Basic room with a single bed, suitable for one person.
  - Booking Cost Formula: Base rate + service charges (if any).
  - Additional Services: No special services.
- Double Room:
  - Features: Room with a double bed, suitable for two people.
  - Booking Cost Formula: Base rate + service charges + additional services (if applicable).
  - Additional Services: Room service available for an extra fee.
- Suite:
  - Features: Spacious and luxurious, suitable for families or high-end guests.
  - Booking Cost Formula: Base rate + luxury tax + service charges.
  - Additional Services: VIP services, including breakfast and room service.

Guest Types:

Properties: Guest ID, Name, Email, Booking History (List of Rooms), Total Booking Fee, Phone Number, Address

- Regular Guest:
  - Features: Standard rates apply, no special discounts.
- Frequent Guest:
  - Features: Loyalty program with discounted rates for repeated bookings.
- Corporate Guest:
  - Features: Special discounted rates for corporate clients, often tied to business conferences or events.

Functionalities of Hotel Management System:

- Room Management:
  - Add new rooms of different types (Single, Double, Suite).
  - Display available rooms based on type and price range.
  - Remove a room if it is no longer in service or needs maintenance.
- Guest Management:
  - Add new guests of different types (Regular, Frequent, Corporate).
  - Display guest details, including their booking history.
  - Remove a guest after all their bookings are completed.
- Booking Transactions:
  - Book a room for a guest based on room availability.
  - Display booking details, including room type, price, and stay duration.

    - Calculate and display the total booking cost, which includes room price, service charges, and taxes (if applicable).
    - Offer additional services (e.g., room service, breakfast) that can be added to the total cost.
    - Store all booking transactions in the HMS.
- Service Charges and Taxes:
    - For all Rooms: A percentage of the booking cost may be charged as service fees, determined by hotel management.
    - For Suites: Additional luxury tax is added on top of the base rate and service fees.

Constraints:

• Implement encapsulation to protect the internal state of classes.
• Use abstraction to hide unnecessary details.
• Utilize polymorphism for variations in different calculations
• Implement inheritance where appropriate, such as creating a base class and/or interface where applicable
• Identify static and final variables and use them appropriately.

Submission Guidelines:

• Submit a well-documented Java program adhering to OOP principles.
• Follow the good Coding Conventions specified by Google JAVA style
• Provide sample test cases demonstrating the program's functionality. Provide jUnit test cases for all developed classes and the requested functionalities.
• Include comments explaining the logic and design decisions.

This assignment assesses your OOP proficiency and your ability to design a robust software system. Feel free to seek clarification on the requirements.

Good luck!