**Hotel Booking [Searching and Booking] LLD**

Designing a basic hotel reservation system involves creating a robust structure that includes API designs, classes, interfaces, and database schema. The system will allow users to search for available hotels and book rooms.

**API Design**

**Hotel Search**

**API:** GET /hotels

**Description**: Retrieve a list of hotels based on location, date, and other optional filters.

Parameters:

**location** (string): The city or area to search.

**check\_in\_date** (date): The desired check-in date.

**check\_out\_date** (date): The desired check-out date.

**guests** (int): Number of guests.

**rooms** (int): Number of rooms required.

**Returns**: List of hotels with availability and basic details.

**Room Details**

**API:** GET /hotels/{hotel\_id}/rooms

**Description**: Retrieve details of available rooms in a specific hotel.

**Parameters**: None.

**Returns**: Detailed list of rooms available in the hotel.

**Booking**

**API:** POST /bookings

**Description:** Create a new booking.

**Body:**

user\_id (int)

hotel\_id (int)

room\_id (int)

check\_in\_date (date)

check\_out\_date (date)

guests (int)

**Returns**: Booking confirmation details.

### Class and Interface Design

***Key Classes***

**Hotel**

**Properties**: id, name, location, description, amenities.

**Methods**: fetchAvailableRooms, checkAvailability.

**Room**

**Properties**: id, hotel\_id, room\_type, price, capacity.

**Methods**: checkAvailability.

**Booking**

**Properties**: id, user\_id, hotel\_id, room\_id, check\_in\_date, check\_out\_date, guests.

**Methods**: createBooking, modifyBooking, cancelBooking.

**User**

**Properties**: id, name, email, bookingHistory.

**Methods**: makeBooking, cancelBooking.

***Interfaces***

**IHotelService**

**Methods**: searchHotels, getHotelDetails.

**IBookingService**

**Methods**: bookRoom, changeBooking, viewBooking.

### Database Design

***Schema***

**Hotels**

* **id** INT
* **name** VARCHAR
* **location** VARCHAR
* **description** TEXT
* **amenities** TEXT

**Rooms**

* **id** INT
* **hotel\_id** INT
* **room\_type** VARCHAR
* **price** DECIMAL
* **capacity** INT

**Bookings**

* **id** INT
* **user\_id** INT
* **hotel\_id** INT
* **room\_id** INT
* **check\_in\_date** DATE
* **check\_out\_date** DATE
* **guests** INT

**Users**

* **id** INT
* **name** VARCHAR
* **email** VARCHAR

### ****Design Patterns Used****

* Singleton Pattern
* Factory Pattern
* Strategy Pattern
* Observer Pattern
* Decorator Pattern
* Adapter Pattern
* Facade Pattern
* Command Pattern