Hotel Reservation System Domain Description & Initial Modeling

# 1. Domain Description

The Hotel Reservation System allows customers to browse hotels, check room availability, make bookings, manage reservations, and process payments.   
The system supports dynamic pricing, seasonal rate adjustments, loyalty rewards, and integration with external services like car rentals.   
It ensures data security, real-time updates, and a seamless user experience for both customers and hotel administrators.  
  
**Features:**- Search hotels/rooms by location, type, availability, and price  
- Real-time room availability updates  
- Booking and cancelation functionalities  
- Loyalty program management  
- Secure payment processing  
- Dynamic and seasonal pricing  
- External service integration (car rental, excursions)

# 2. Initial Object Identification Table

|  |  |
| --- | --- |
| Object Name | Description |
| Hotel | Represents a hotel entity with its own attributes |
| Room | Individual room entity within a hotel |
| Customer | Person who uses the system to make bookings |
| Reservation | Represents a customer's booking of a room |
| RoomType | Category or classification of a room (e.g., suite, deluxe) |
| RoomAvailability | Daily room availability tracking |
| Payment | Payment details for a reservation |
| LoyaltyProgram | Stores loyalty data such as points, tier, etc. |
| Promotion | Promotional offers applied to rooms or reservations |
| PricingStrategy | Dynamic and seasonal pricing management |
| RoomAmenity | Represents features associated with rooms |
| ExternalService | Third-party services integrated with the system |

# 3. Initial Attribute and Method Tables

## Hotel

Attributes:

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Visibility | Rationale |
| hotelID | int | private | Unique identifier |
| name | String | private | Hotel name |
| address | String | private | Physical address |
| location | String | private | City or area |
| starRating | int | private | Rating out of 5 |
| contactInfo | String | private | Phone/email |

Methods:

|  |  |  |  |
| --- | --- | --- | --- |
| Method | Return Type | Visibility | Rationale |
| getRooms() | List<Room> | public | View all hotel rooms |
| searchRooms() | List<Room> | public | Filter rooms |

## Room

Attributes:

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Visibility | Rationale |
| roomID | int | private | Unique ID |
| hotelID | int | private | Foreign key |
| number | String | private | Room number |
| roomType | RoomType | private | Room category |
| price | double | private | Base price |

Methods:

|  |  |  |  |
| --- | --- | --- | --- |
| Method | Return Type | Visibility | Rationale |
| isAvailable() | boolean | public | Check availability |
| updatePrice() | void | public | For dynamic pricing |

## Customer

Attributes:

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Visibility | Rationale |
| customerID | int | private | Unique user ID |
| name | String | private | Full name |
| email | String | private | Contact info |
| phone | String | private | Mobile number |
| loyaltyProgram | LoyaltyProgram | private | Link to rewards |

Methods:

|  |  |  |  |
| --- | --- | --- | --- |
| Method | Return Type | Visibility | Rationale |
| bookRoom() | Reservation | public | Make reservation |
| cancelBooking() | boolean | public | Cancel reservation |

## Reservation

Attributes:

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Visibility | Rationale |
| reservationID | int | private | Unique ID |
| customerID | int | private | Customer ref |
| roomID | int | private | Room ref |
| checkInDate | Date | private | Booking start |
| checkOutDate | Date | private | Booking end |
| status | String | private | Confirmed/canceled |
| specialRequests | String | private | Notes/preferences |

Methods:

|  |  |  |  |
| --- | --- | --- | --- |
| Method | Return Type | Visibility | Rationale |
| modify() | void | public | Change reservation |
| cancel() | void | public | Cancel booking |

## PricingStrategy

Attributes:

|  |  |  |  |
| --- | --- | --- | --- |
| Attribute | Type | Visibility | Rationale |
| strategyID | int | private | Unique strategy |
| roomID | int | private | Applies to room |
| season | String | private | Off/peak |
| occupancyRate | double | private | For dynamic pricing |
| basePrice | double | private | Normal price |
| dynamicPrice | double | private | Calculated price |

Methods:

|  |  |  |  |
| --- | --- | --- | --- |
| Method | Return Type | Visibility | Rationale |
| applyDiscount() | double | public | Adjusted price |

# 4. Initial UML Class Diagram (Draft)

