

## Project 5 - Hotel Reservation and Guest Services Management System

SkyNest Hotels is a regional hotel chain operating in Sri Lanka, offering accommodation and premium services in its branches located in Colombo, Kandy, and Galle. The management has been using an outdated desktop-based system for bookings and service tracking, which has led to frequent overbookings, billing delays, and manual errors.

To modernise operations, SkyNest has decided to implement a unified **Hotel Reservation and Guest Services Management System (HRGSMS)**. Your team is hired to design the backend database that supports hotel room bookings, guest check-ins/check-outs, service tracking, and billing. A UI is required for the system, but the primary focus is on database correctness, consistency, and report generation.

The system must support the following features:

- Each hotel branch consists of a number of **rooms**, categorised by **room type** (e.g., Single, Double, Suite). Room types differ by capacity, daily rate, and amenities.
- A **guest** can make a **room booking** for a given check-in and check-out period. Each booking includes room details, guest information, payment method, and booking status (Booked, Checked-In, Checked-Out, Cancelled).
- The system must prevent **double-booking** of the same room during overlapping periods.
- At the time of check-in, the system must update the room status to **Occupied**, and once the guest checks out, it must be updated to **Available**.
- During their stay, guests can request **chargeable services**, such as room service, spa treatments, laundry, or minibar usage. These services are stored in a **service catalogue** and linked to the respective booking.
- Each service usage entry includes service name, date, quantity, and price at the time of usage.
- At checkout, the system must calculate the **final bill**, which includes:
  - Room charges (based on room rate × number of nights)
  - Service charges (sum of all services used during the stay)
- The total bill must be paid before the booking is marked as Checked-Out.
- Guests can make **partial payments**, but the system must flag bookings with outstanding dues.

The management requires the following reports from the system:

1. Room occupancy report for a selected date or period
2. Guest billing summary, including unpaid balances
3. Service usage breakdown per room and service type
4. Monthly revenue per branch (from room charges and services)
5. Top-used services and customer preference trends

### **Task**

Your task is to model the database design to encapsulate these requirements. It should consider all entities and relationships given in the description. Moreover, you must identify where **procedures, functions, and triggers** are required to ensure **ACID** compliance. Foreign keys and primary keys must be defined for referential integrity. Appropriate indexing must be applied to improve performance in frequent queries.

Additionally, review materials related to hotel operations and make assumptions where necessary (e.g., tax rules, discount policies, late checkout charges). Populate the database with:

- 3 hotel branches
- At least 10 rooms with different types
- 6 services in the service catalogue
- 5 guests with 8 total bookings
- Room availability records, service usage, and at least 3 partial payments