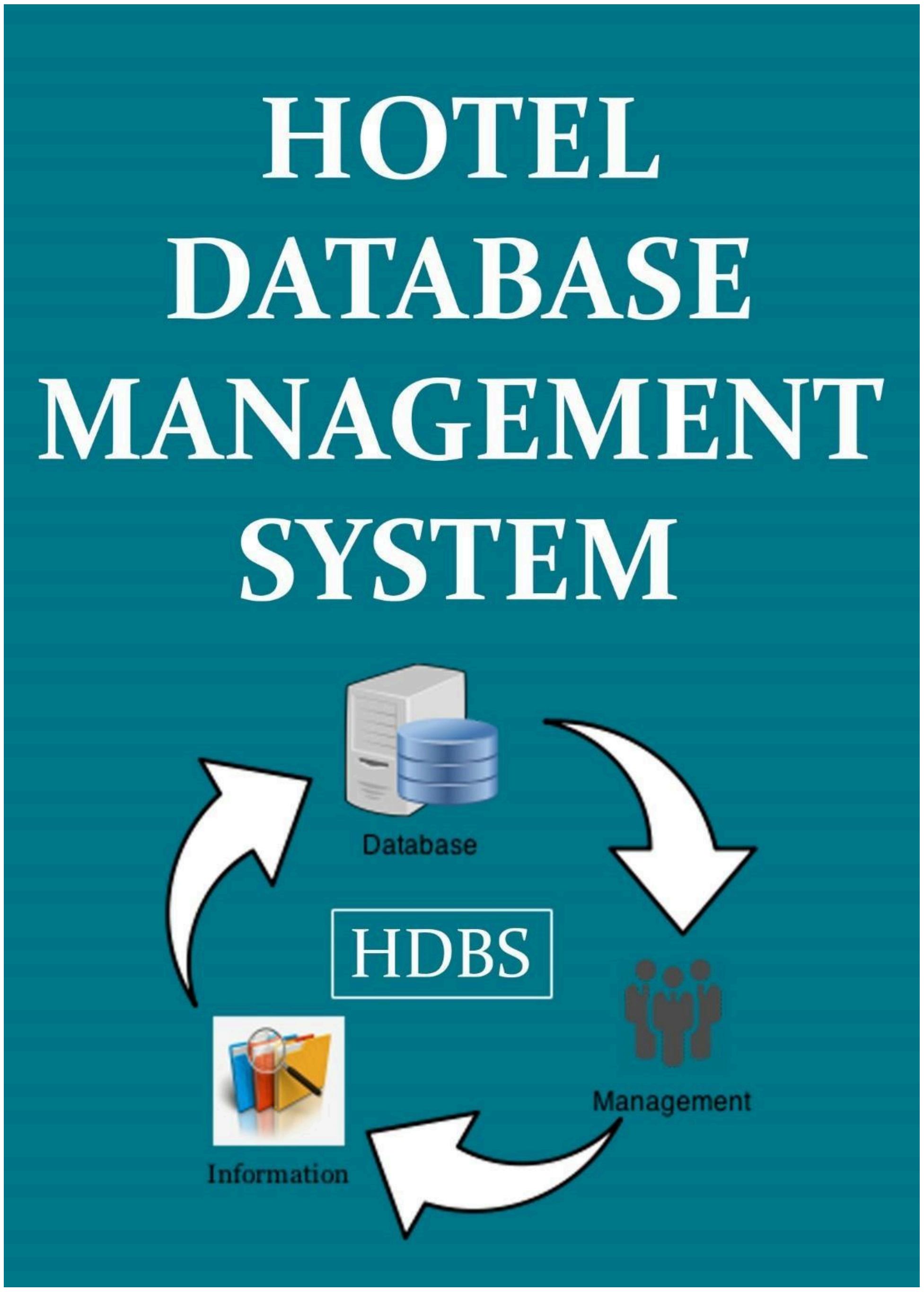


HOTEL DATABASE MANAGEMENT SYSTEM

DOCUMENTATION BY: **NANDINI RATHOD**

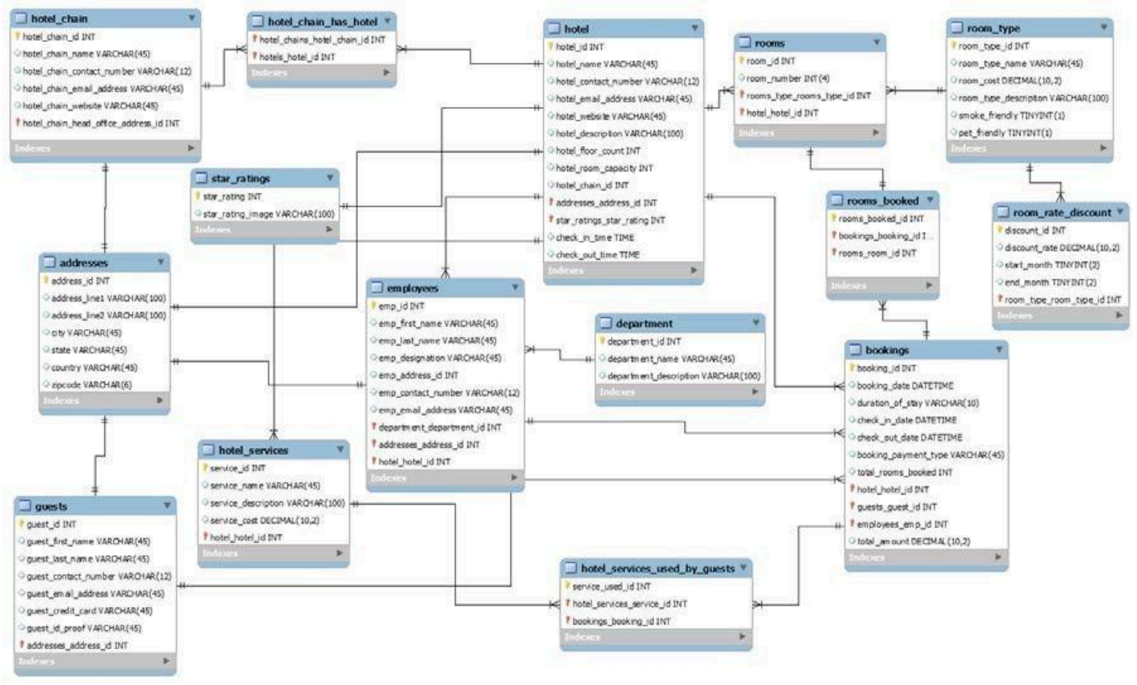
INTRODUCTION: Overview of project & analyze the requirements

The main objective of this project is to create a database management system for a hotel. The hotel can have multiple chains, which can further have multiple hotels. Therefore, we need an organized management system, which can easily manage all the operations and data of the hotel chains and hotels respectively. We will be managing the below areas of the hotel database management system.

- The hotel chains, their details.
- The hotels in each chain and their details and other information like the rooms and their description and discounts, etc.
- Information about employees and departments they work in.
- Information about guests.
- Managing bookings and other services used by the guests.

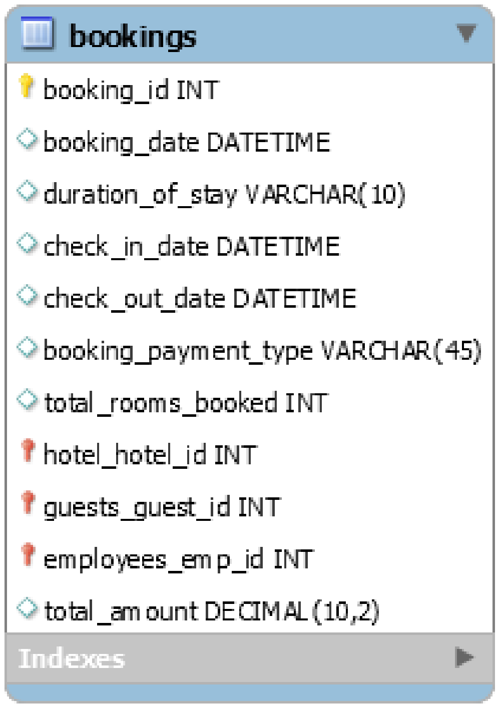
DATABASE DESIGNING: Starting with drawing the ERR diagram

We started with designing the structure of the database. We drew the ERR diagram on a paper, noting down all the tables required. We designed each table with columns and attributes respectively and trying to make an idea about the relationships between tables. We tried to keep the tables in a form where we can reduce the data redundancy and tried to make it accessible in an easy and simple way. The ERR diagram created is as below:


hotel_chain
hotel_chain_id INT
hotel_chain_name VARCHAR(45)
hotel_chain_contact_number VARCHAR(12)
hotel_chain_email_address VARCHAR(45)
hotel_chain_website VARCHAR(45)
hotel_chain_head_office_address_id INT
Indexes
hotel_chain_has_hotel
hotel_chains_hotel_chain_id INT
hotels_hotel_id INT
Indexes
hotel
hotel_id INT
hotel_name VARCHAR(45)
hotel_contact_number VARCHAR(12)
hotel_email_address VARCHAR(45)
hotel_website VARCHAR(45)
hotel_description VARCHAR(100)
hotel_floor_count INT
hotel_room_capacity INT
hotel_chain_id INT
addresses_address_id INT
star_ratings_star_rating INT
check_in_time TIME
check_out_time TIME
Indexes
rooms
room_id INT
room_number INT(4)
rooms_type_rooms_type_id INT
hotel_hotel_id INT
Indexes
room_type
room_type_id INT
room_type_name VARCHAR(45)
room_cost DECIMAL(10,2)
room_type_description VARCHAR(100)
smoke_friendly TINYINT(1)
pet_friendly TINYINT(1)
Indexes
star_ratings
star_rating INT
star_rating_image VARCHAR(100)
Indexes
rooms_booked
rooms_booked_id INT
bookings_booking_id I...
rooms_room_id INT
Indexes
room_rate_discount
discount_id INT
discount_rate DECIMAL(10,2)
start_month TINYINT(2)
end_month TINYINT(2)
room_type_room_type_id INT
Indexes
addresses
address_id INT
address_line1 VARCHAR(100)
address_line2 VARCHAR(100)
city VARCHAR(45)
state VARCHAR(45)
country VARCHAR(45)
zipcode VARCHAR(6)
Indexes
employees
emp_id INT
emp_first_name VARCHAR(45)
emp_last_name VARCHAR(45)
emp_designation VARCHAR(45)
emp_address_id INT
emp_contact_number VARCHAR(12)
emp_email_address VARCHAR(45)
department_department_id INT
addresses_address_id INT
hotel_hotel_id INT
Indexes
department
department_id INT
department_name VARCHAR(45)
department_description VARCHAR(100)
Indexes
bookings
booking_id INT
booking_date DATETIME
duration_of_stay VARCHAR(10)
check_in_date DATETIME
check_out_date DATETIME
booking_payment_type VARCHAR(45)
total_rooms_booked INT
hotel_hotel_id INT
guests_guest_id INT
employees_emp_id INT
total_amount DECIMAL(10,2)
Indexes
hotel_services
service_id INT
service_name VARCHAR(45)
service_description VARCHAR(100)
service_cost DECIMAL(10,2)
hotel_hotel_id INT
Indexes
guests
guest_id INT
guest_first_name VARCHAR(45)
guest_last_name VARCHAR(45)
guest_contact_number VARCHAR(12)
guest_email_address VARCHAR(45)
guest_credit_card VARCHAR(45)
guest_id_proof VARCHAR(45)
addresses_address_id INT
Indexes
hotel_services_used_by_guests
service_used_id INT
hotel_services_service_id INT
bookings_booking_id INT
Indexes

DEFINE TABLES: Design the tables, columns and relationships

We started with designing the structure of the database. We drew the ERR diagram on a paper, noting down all the tables required. We designed each table with columns and attributes respectively. I have designed the below tables:


bookings

booking_id INT
booking_date DATETIME
duration_of_stay VARCHAR(10)
check_in_date DATETIME
check_out_date DATETIME
booking_payment_type VARCHAR(45)
total_rooms_booked INT
hotel_hotel_id INT
guests_guest_id INT
employees_emp_id INT
total_amount DECIMAL(10,2)

bookings table contains data about the booking made for rooms. The primary key for this table is booking_id.

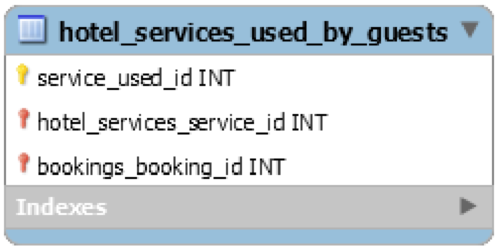
The table has the following foreign keys:

hotel_hotel_id which has a many-to-one relationship with the hotel table.

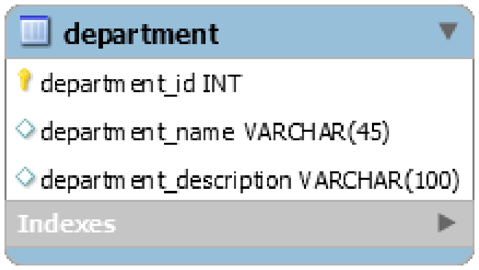
guests_guest_id which has a many-to-one relationship with the guests table.

employees_emp_id which has a many-to-one relationship with the employees table.

hotel_services_used_by_guests table contains info about the services used by the guests. Primary key is service_used_id & two foreign keys, hotel_services_service_id, which relates to hotel_services table & bookings_booking_id relates to bookings table.


hotel_services_used_by_guests

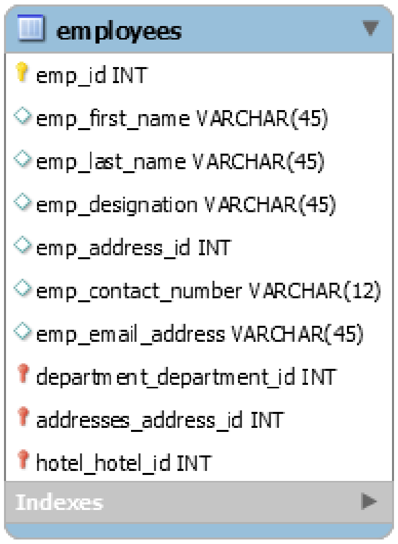
service_used_id INT
hotel_services_service_id INT
bookings_booking_id INT


department

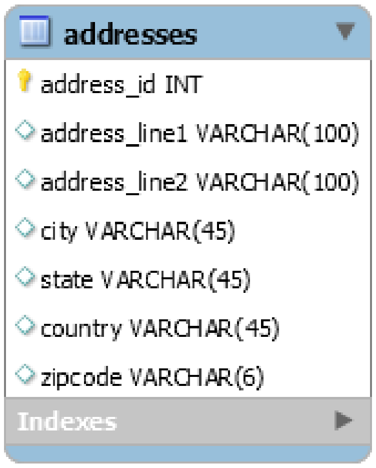
department_id INT
department_name VARCHAR(45)
department_description VARCHAR(100)

department table contains the data about the different departments of the hotel. The primary key is department_id, which creates a one-to-many relationship with the employees table.

employees table consists of data related to the employees. The primary key is employee_id. There are three foreign keys, service_id that denotes many-to-one relations with the department table.
address_id that denotes one-to-one relationship with the addresses table.
hotel_id that denotes many-to-one relationship with the hotel table.

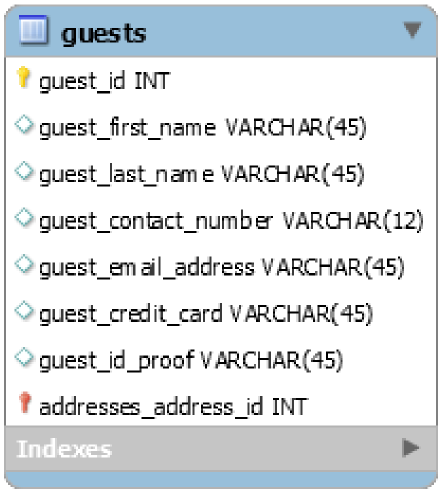


employees
emp_id INT
emp_first_name VARCHAR(45)
emp_last_name VARCHAR(45)
emp_designation VARCHAR(45)
emp_address_id INT
emp_contact_number VARCHAR(12)
emp_email_address VARCHAR(45)
department_department_id INT
addresses_address_id INT
hotel_hotel_id INT
Indexes



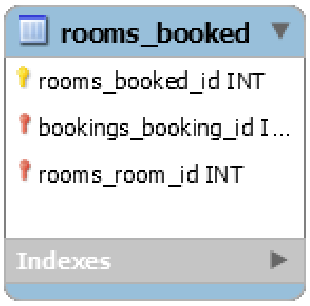
addresses
address_id INT
address_line1 VARCHAR(100)
address_line2 VARCHAR(100)
city VARCHAR(45)
state VARCHAR(45)
country VARCHAR(45)
zipcode VARCHAR(6)
Indexes

addresses table defines the information about the address of guests, hotels, hotel chains, employees.
The primary key of the table is address_id.
It maintains one-to-one relationship with tables, hotel_chain, hotel, employees and guests.



guests
guest_id INT
guest_first_name VARCHAR(45)
guest_last_name VARCHAR(45)
guest_contact_number VARCHAR(12)
guest_email_address VARCHAR(45)
guest_credit_card VARCHAR(45)
guest_id_proof VARCHAR(45)
addresses_address_id INT
Indexes

guests table has the data about the guests that check in to the hotel. The primary key of this table is guest_id. there is one foreign key in this table, address_id that has one-to-one relationship with the address table.



rooms_booked
rooms_booked_id INT
bookings_booking_id I...
rooms_room_id INT
Indexes

rooms_booked table has one primary key, rooms_booked_id.
This table has 2 foreign keys,
booking_id which has many-to-one relationship with the bookings table and room_id which has one-to-one-relationship with the rooms table.

NORMALIZATION: Tables should be normalized till 3rd norm

Database normalization is the process of restructuring a relational database in accordance with a series of so-called normal forms in order to reduce data redundancy and improve data integrity. Generally, if a database is normalized until third normal form then it is considered to be normalized. We tried to normalize the database until third normal form.

WRITING QUERIES AND TRIGGERS AND VIEWS:

Writing down the queries was the easiest part for us. As we put a lot of effort in designing the database and creating relationships in a manner that, it will be easier to fetch the data from two or more tables. We wrote the queries as per the requirements and check in twice with valid as well as invalid data. We created two views and two triggers as below:

Views –
GuestsDetails – This view shows all the information about the guests.
EmployeeDetails – This view shows all the information about the employees and their respective departments.

Triggers –
BookingAudit_OnInsert – When a new booking is generated, this trigger will create a booking audit table and insert the data into it.
BookingAudit_OnDelete – When a booking is deleted, this trigger will be called and a row will be inserted on the Booking Audit table with the information of the booking that is being deleted.

CHALLENGES FACED:

We faced most of the challenges in creating relationships among tables. We need to make sure that all the relationships created among tables are logical and follow the normalization rules. The most challenging part was creating the booking and the rooms table and its relationships with other respective tables.

SUMMARY:

This was an attempt to create a database management system for hotel where a DBA can easily manage the hotels, rooms, bookings, guests, employees, departments, services, etc. and other things as well, easily and quickly. Overall, it is huge area and we tried to cover few of the parts of it. Thank you!

DOCUMENTATION BY: **NANDINI RATHOD**