PROJECT SUBMISSION -3

HOTEL PROPERTY MANAGEMENT SYSTEM

TEAM DETAILS:

Team Name: Outliers

★ **Team Members:**
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SUMMARY:

Hotel Property Management System is a platform where the guests can book a room and the admin team can assist the guest/s when they come for a stay. This management system ensures sound communication between the housekeeping staff and the administrator so that the waiting time of guest is eliminated. A guest can be treated better for the next visit as a preference note that includes all the special requests by the guest is maintained. This system also handles overbooking by using the sister properties present in the same ZIP codes by allocating rooms in the available nearby sister property.

OBJECTIVES:

1. A centralized database should be maintained for all the property branches, which can be accessed from any location.
2. Real-time updates between housekeeping and front desk can be maintained in order to avoid miscommunication.
3. Necessity of creating a customer account and maintaining their history which can be accessed at anytime from anywhere.
4. Front-desk team must be able to view and book rooms for customers as well as present dynamic rates.

PROBLEM STATEMENT:

1. Miscommunications can be caused between the housekeeping and front desk team regarding the room status which increases the customer wait time.

2. To check customer preferences for maintaining customer satisfaction requires previous reservation records from all hotel branches which can be difficult to maintain in a local file as the retrieval process of the data takes time.
3. Overbooking causes difficulty in managing room allocation.
4. Maintaining dynamic pricing of the rates based on events, seasons and availability of rooms can make walk-in reservations difficult.

PROPOSED SOLUTION:

A database model can be used to resolve all the issues mentioned above:

1. Using current **TIMESTAMP** in database system for Real Time updates. Data added to the ROOM STATUS table can be used to check the room's status whose right of accessibility is given to both Housekeeping and Front-desk department.
2. A **PREFERENCES** table is maintained that can be accessed anywhere from any hotel property which contains notes about the guest's likes and dislikes.
3. A table **HOTEL** contains all details of hotel properties along with its **ZIPCODE** and **ROOM_AVAILABILITY** which can be used to check the properties that bear the same ZIPCODE and has rooms available in it can be checked and the guests can be allocated a room in a sister property when there is overbooking.
4. Dynamic rates can be tackled using **STNDRD_RATE** attribute present in a **ROOM_TYPE** ENTITY in combination with **RACK_AMOUNT** attribute present in **RACK_RATE** ENTITY.
5. The Guest is also charged on the type of Amenities requested while booking the room. A separate **AMENITY** table is maintained which contains **AMENITY_PRICE** that defines the price of amenities offered by the hotel.
6. A special discount is given to staff and members of the hotel which is maintained in the **DISCOUNT** table.

FINAL AMOUNT: STANDARD_RATE + RACK_AMOUNT + AMENITY_PRICE – DISCOUNT;

DATA MODEL E-R DIAGRAM:
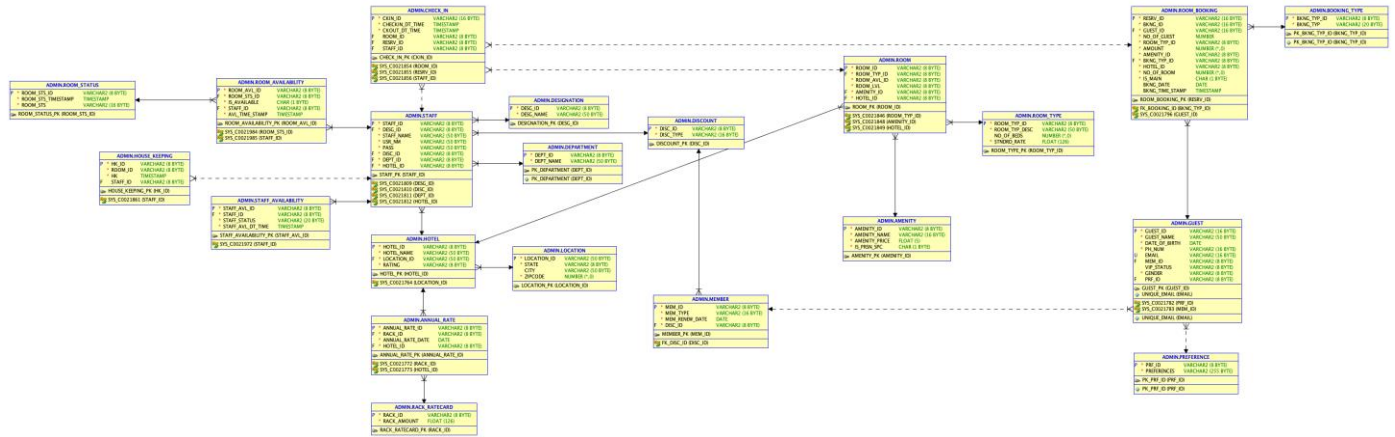
ENTITIES:

HOTEL ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
HOTEL_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
HOTEL_NAME	VARCHAR(50)	NOT NULL
LOCATION_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES LOCATION Table which is used to identify where the hotel is located. NOT NULL
RATING	VARCHAR (8)	A Value which is used to identify the Rating of the Hotel. NOT NULL

ROOM BOOKING ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
RESRV_ID	VARCHAR(16)	PRIMARY KEY, COMBINATION OF BKNG_ID AND GUEST_ID
BKNG_ID	VARCHAR (16)	UNIQUE, AUTO GENERATED
GUEST_ID	VARCHAR(16)	A FOREIGN KEY which REFERENCES Guest Table to get guest details such as name, age etc. NOT NULL

NO_OF_GUEST	INTEGER	NOT NULL
ROOM_TYP_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES Room Type Table to get details such as room type description, no of guests. NOT NULL
AMOUNT	FLOAT	The Final amount will be displayed depending upon the options chosen by the Guest. NOT NULL
BOOKING_DATE	DATE	NOT NULL
AMENITY_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES Amenities Table to choose the type of Amenities chosen by the guest. NOT NULL
BKNG_TYP_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES BOOKING_TYPE Table which is used to retrieve the booking type like: Online, Third Party, Phone Call, Walk-in, etc. NOT NULL
HOTEL_ID	VARCHAR (8)	A FOREIGN KEY which references HOTEL Table that is used to retrieve the details of a hotel for which the room booking is done. NOT NULL
NO_OF_ROOM	INTEGER	NOT NULL
IS_MAIN	BOOLEAN	Specifies True if the GUEST_ID matches the person who booked the rooms else False. NOT NULL

RACK_RATECARD ENTITY		
ATTRIBUTES	**DATA TYPE AND SIZE**	**COMMENTS**
RACK_ID	VARCAHR(8)	PRIMARY KEY, AUTO GENERATED
RACK_AMOUNT	FLOAT	Defines the amount for each Slabs which is changed daily by the General Manager. NOT NULL

LOCATION ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
LOCATION_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
STATE	VARCHAR(255)	NOT NULL
CITY	VARCHAR(50)	NOT NULL
ZIPCODE	INTEGER	NOT NULL

CHECK_IN ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
CKIN_ID	VARCHAR(16)	PRIMARY KEY, AUTO GENERATED
CKIN_DATE_TIME	TIMESTAMP	NOT NULL, CURRENT_TIMESTAMP
CKOUT_DATE_TIME	TIMESTAMP	NOT NULL, CURRENT_TIMESTAMP
ROOM_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES ROOM table to get details such as Room level, Room types etc. NOT NULL
RESRV_ID	VARCHAR(16)	A FOREIGN KEY which REFERENCES ROOM BOOKING Table to retrieve the date of booking, booking ID etc. NOT NULL
STAFF_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES STAFF Table to identify which Staff booked the guest. CANNOT BE NULL

BOOKING TYPE ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
BKNG_TYP_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
BKNG_TYP	VARCHAR(20)	Defines the type of booking i.e., Online, Phone, Third Party and Walk-In, etc. NOT NULL

MEMBER ENTITY	

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
MEM_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
MEM_TYPE	VARCHAR(16)	Defines the type of membership available i.e., Platinum, Gold and Silver. NOT NULL
MEM_RENEW_DATE	DATE	Defines the date membership needs to renew. NOT NULL
DISC_ID	VARCHAR(8)	A Foreign key which references DISCOUNT Table to get the type of Discount based on the membership. CAN BE NULL

ANNUAL RATE ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
ANNUAL_RATE_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
RACK_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES RACK Table to retrieve Rack Amount. NOT NULL
DATE	DATE	A FOREIGN KEY which REFERENCES Hotel ID Table to retrieve the annual rates for that particular hotel. NOT NULL
HOTEL_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES Hotel ID Table to retrieve the date of booking, booking ID etc. NOT NULL

GUEST ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
GUEST_ID	VARCHAR(16)	PRIMARY KEY, AUTO GENERATED
GUEST_NAME	VARCHAR(50)	NOT NULL
DATE_OF_BIRTH	DATE	NOT NULL

PH_NUM	VARCHAR(16)	NOT NULL
EMAIL	VARCHAR(50)	UNIQUE KEY, NULL
MEMBERSHIP_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES MEMBERSHIP Table to identify the type of Membership the Guest holds. CAN BE NULL
VIP_STATUS	VARCHAR(8)	Describes the VIP Status such as President or CEO or Celebrity etc. CAN BE NULL
GENDER	VARCHAR(8)	NOT NULL
PRF_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES PREFERENCES Table to identify the Preferences of the Guest. CAN BE NULL

DEPARTMENT ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
DEPT_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
DEPT_NAME	VARCHAR(50)	Name of the Department i.e., Front Office Booking, House Keeping etc. NOT NULL

DESIGNATION ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
DESG_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
DESG_NAME	VARCHAR(50)	Name of the Designation i.e., General Manager, Revenue Manager etc. NOT NULL

STAFF ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
STAFF_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED

DESG_ID	VARCHAR(8)	NOT NULL
STAFF_NAME	VARCHAR(50)	NOT NULL
USR_NM	VARCHAR(50)	UNIQUE KEY, NOT NULL
PASSWORD	VARCHAR(50)	UNIQUE KEY, NOT NULL
DISC_ID	VARCHAR(8)	A FOREIGN key which REFERENCES DISCOUNT Table to get the type of Discount based on the staff. NOT NULL
DEPT_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES DEPARTMENT Table to identify which department the staff belongs to NOT NULL
HOTEL_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES Hotel Table to identify which hotel the staff belongs to NOT NULL

AMENITY ENTITY		
ATTRIBUTES	**DATA TYPE AND SIZE**	**COMMENTS**
AMEMITY_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
AMENITY_NAME	VARCHAR(16)	NOT NULL
AMENITY_PRICE	FLOAT	NOT NULL
IS_PRSN_SPC	BOOLEAN	Is Person Specific which defines if the amenities chosen is Guest specific or not. NOT NULL

ROOM STATUS ENTITY		
ATTRIBUTES	**DATA TYPE AND SIZE**	**COMMENTS**
ROOM_STS_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
ROOM_STS_TIMESTAMP	TIMESTAMP	NOT NULL
ROOM_STS	VARCHAR(16)	Defines the Status of the room i.e., Available, out of service etc. NOT NULL

HOUSE KEEPING ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
HK_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
ROOM_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES ROOM Table to identify which room the cleaning needs to be done. NOT NULL
HK_TIME	TIMESTAMP	NULL
STAFF_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES STAFF Table to identify the Staff Details. NOT NULL

ROOM ENTITY		
ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
ROOM_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
ROOM_TYP_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES ROOM TYPE Table to identify the type of room. NOT NULL
ROOM_AVL_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES ROOM AVAILABILITY Table to identify the availability of the room. NOT NULL
ROOM_LVL	VARCHAR(8)	Defines level of the room. NOT NULL
AMENITY_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES AMENITIES Table to identify the amenities chosen. CAN BE NULL
HOTEL_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES HOTEL Table to identify the Hotel Details. NOT NULL

ROOM TYPE ENTITY		
ATTRIBUTES	**DATA TYPE AND SIZE**	**COMMENTS**
ROOM_TYP_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
ROOM_TYP_DESC	VARCHAR(50)	Describes the type of the room such as Deluxe, Presidential Suite etc. NOT NULL
NO_OF_BEDS	INT	NULL
STNDRD_RATE	FLOAT	Defines the Standard Rate of the Room NOT NULL

ROOM AVAILABILITY		
ATTRIBUTES	**DATA TYPE AND SIZE**	**COMMENTS**
ROOM_AVL_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
ROOM_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES ROOM Table to identify for which room what is the available status NOT NULL
ROOM_STS_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES ROOM STATUS Table to identify the status of the room. NOT NULL
IS_AVAILABLE	BOOLEAN	IS_AVAILABLE is a TRUE or FALSE value based on whether the room is Available or not. NOT NULL

PREFERENCE ENTITY		
ATTRIBUTES	**DATA TYPE AND SIZE**	**COMMENTS**
PRF_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED

PREFERENCES	VARCHAR(255)	A list of stored preferences for the guest such as Non-Smoking, Top Floor View etc. NOT NULL

DISCOUNT ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
DISC_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
DISC_TYPE	VARCHAR (255)	Contains the type of discount available for each member. NOT NULL

STAFF AVAILABILITY ENTITY

ATTRIBUTES	DATA TYPE AND SIZE	COMMENTS
STAFF_AVL_ID	VARCHAR(8)	PRIMARY KEY, AUTO GENERATED
STAFF_ID	VARCHAR(8)	A FOREIGN KEY which REFERENCES STAFF Table to identify the Details of staff such as Name. NOT NULL
STAFF_STATUS	VARCHAR(8)	Which Defines whether the staff is available or not. NOT NULL
STAFF_AVL_DT_TIME	TIMESTAMP	NULL

BUSINESS RULES:

1. A **ROOM** is associated with only one **ROOM_AVAILABILITY**.
2. **ROOM_STATUS** can have three status (i.e., Cleaned, Cleaning in progress, Out of service) and only one can be assigned at a time.
3. A **ROOM** is associated with only one **ROOM_TYPE**.
4. A **ROOM_ID** can belong to only one **HOTEL.**
5. In **ROOM_ AVAILABILITY**, a room will be either Available or Not Available.
6. A **ROOM** is associated with only one **ROOM_TYPE**.

7. A **ROOM_TYPE** can be associated with zero or multiple **ROOMs.**
8. A **HOTEL** can have one or more **ROOM.**
9. A **HOTEL** can have one or more **AMENITY.**
10. A **HOTEL** can have one or more **STAFF**.
11. A **DEPARTMENT** can have one or more **STAFF**.
12. A **HOTEL** can have one or more **STAFF**.
13. A **DEPARTMENT** can have one or more **STAFF**.
14. A **HOUSEKEEPING** member is a **STAFF_MEMBER**.
15. **GUEST** can select zero or more **AMENITIES** available.
16. A **MEMBER** is a **GUEST**, but a **GUEST** can/cannot be a **MEMBER**.
17. If the price of an **AMENITY** is person specific then, it will be multiplied by the number of guests.
18. **ANNUAL_RATE** can vary for different **HOTEL** for the same day.
19. A **BOOKING** can only be done via a Phone Call, Walk-in or Third-party.
20. A **STAFF** can be assigned to only one **DEPARTMENT**.
21. A **STAFF** can be assigned only one **DESIGNATION**.
22. A **DESIGNATION** can be given to one or more **STAFF**.
23. **DISCOUNT_ID** is available only to **STAFF** and **MEMBER**.
24. Two **HOTELS** can be in the same **ZIP_CODE**.
25. A **HOTEL** can only have only one **ZIP_CODE.**
26. A **HOTEL** can have rating BETWEEN 1-5.
27. **ANNUAL_RATE** is always defined by a revenue manager and is changed every day.
28. **RACK_RATE** is associated with **ANNUAL_RATE.**
29. A **ROOM_TYPE** can be associated with zero or multiple **ROOMs**.
30. A **STAFF** can belong to only one **HOTEL**.
31. A **STAFF** can belong to only one **DEPARTMENT**.
32. A **STAFF** can have only one **DESIGNATION**.
33. A **STAFF** can have zero or more availability in a day.
34. A **CHECKOUT_DATE** cannot be prior to **CHECKIN_DATE.**
35. **PREFERENCES** contains the notes for each guest about the amenities previously requested.

SECURITY CONSTRAINTS: (User level Access/Permissions)

Admin:

- Has **FULL ACCESS** to all the entities in the database.

House Keeping:

- Can **READ/WRITE** ROOM_STATUS and ROOM_AVAILABILITY Entity.

Front Office:

- Can **READ/WRITE/UPDATE** ROOM_AVAILABILITY Entity, ROOM_BOOKING Entity.
- In GUEST Entity, can only **WRITE/UPDATE** Name, Phone number and email address but **READ** other attributes.

Revenue Manager:

- Can **READ/WRITE/UPDATE** RACK_RATECARD Entity.
- Can **READ/UPDATE** ANNUAL_RATECARD.