Project: Itinerary Management System COURSE INSTRUCTOR: Dr V.B Nikam

REG.NO: 221080076 & 221081009

DBMS PROJECT A3

SQL to create tables, constraints and Manipulate the data for the Logical Schema you designed for your ER Data Model

Aditya Yedurkar, 221080076

Aditi Chhajed, 221081009

Travel Management Project

This project is aimed at managing travel-related activities such as user profiles, accommodations, transportation, itineraries, and billing. It provides a comprehensive database schema to store and manage information efficiently.

AIM:

SQL-DDL to create tables and constraints for the Logical Schema you designed for your ER Data Model

SQL-DML to manipulate data for the your ER Data Model

SQL-DML should explore Complex queries, Aggregate functions like Avg, group, sort etc to manipulate data for the your ER Data Model

SQL-DML should explore Nested queries, Join Queries, along with the complex queries, Aggregate functions etc to manipulate data for the your ER Data Model

Theory:

Table Creation:

Use **CREATE TABLE** statement to define tables in the database schema.

Each table should represent an entity or a relationship from the ER Data Model.

Attributes of entities become columns, while relationship cardinalities may become foreign key constraints.

Constraints:

Primary Key Constraint: Identify a unique identifier for each entity using PRIMARY KEY constraint.

Project : Itinerary Management System

REG.NO: 221080076 & 221081009

COURSE INSTRUCTOR: Dr V.B Nikam

Foreign Key Constraint: Establish relationships between tables using FOREIGN KEY constraint. **Unique Constraint**: Ensure uniqueness of values in a column using UNIQUE constraint. *Check Constraint*: Enforce domain integrity by defining conditions using CHECK constraint. Not Null Constraint: Ensure that a column cannot contain null values using NOT NULL constraint. Indexes:

Indexes can be created on columns to improve query performance, especially for columns frequently used in JOIN or WHERE clauses.

SELECT: This keyword is used to select data from a database. The data returned is stored in a result table, called the result-set.

CREATE TABLE: This statement is used to create a new table in a database. It requires the name of the table and the column definitions.

VARCHAR: This is a data type that can hold a variable length string. The maximum length is set in parentheses.

INSERT INTO: This statement is used to insert new data into a table. It requires the name of the table, the columns for which data is provided, and the values to be inserted.

VALUES: This keyword is used in conjunction with INSERT INTO to specify the data to be inserted into the table.

Please note that SQL is case-insensitive, which means CREATE TABLE and create table are equivalent. However, it's common practice to write SQL keywords in uppercase to distinguish them from table and column names.

AS: This keyword is used in SQL to rename a column or table with an alias.

FROM: This keyword is used in SQL to specify the table from which you want to fetch the data.

AVG(): This is an aggregate function that returns the average value of a numeric column.

COUNT(): This is an aggregate function that returns the number of rows that matches a specified criterion.

GROUP BY: This keyword is used in SQL to group rows that have the same values in specified columns into aggregated data.

MAX(): This is an aggregate function that returns the maximum value in a set of values.

MIN(): This is an aggregate function that returns the minimum value in a set of values.

ORDER BY: This keyword is used in SQL to sort the data in ascending or descending order, based on one or more columns.

DESC: This keyword is used with ORDER BY to sort the data in descending order.

Project: Itinerary Management System REG.NO: 221080076 & 221081009 **COURSE INSTRUCTOR: Dr V.B Nikam**

LIMIT: This keyword is used in SQL to specify the maximum number of records to return.

SUM(): This is an aggregate function that returns the total sum of a numeric column.



Database Creation:

```
Hotel_id VARCHAR(512),
Name VARCHAR(512),
No_0f_Rooms INT,
Cost INT,
Address VARCHAR(512),
Rating DOUBLE
                    Address VARCHAR(512),
Rating DOUSLE

RT 19TO Hotel (Hotel_id, Name, No_Of_Rooms, Cost, Address, Rating) VALUES
("H1801", 'Grand Hyatt', '200 , '5000", 'Mumboi', '8.5"),
('H1802", 'Iar] Palace', '150", '6000", 'Delhit, '9"),
('H1802", 'Iar] Palace', '150", '6000", 'Delhit, '9"),
('H1803", 'Marriott Manquis, '180", '5500", 'Bengaluru', '8.7"),
('H1808", 'InterContinental', '8009", '5500", 'Ratia', '8.4"),
('H1808", 'InterContinental', '8009", '5500", 'Ratia', '8.4"),
('H1808", 'Iarle Beroit, '230", '5300", 'Najpur', '8.8"),
('H1809", 'Iarle Palace', '230", '4500", 'Hyderabad', '8.3"),
('H1809", 'Radisson Blu', '170", '5700", 'Ahmedabad', '8.1"),
('H1801", 'Radisson Blu', '170", '5700", 'Ahmedabad', '8.1"),
('H1811", 'The Ritz-Carlton', '250", '4600", 'Goa', '8"),
('H1811", 'The Ritz-Carlton', '250", '4600", 'Goa', '8"),
('H1811", 'Four Seasons', '190", '5300", 'Nagpur', '8.7"),
('H1811", 'Four Seasons', '190", '5300", 'Varansai', '8.6"),
('H1811", 'Four Seasons', '190", '5300", 'Varansai', '8.6"),
('H1811", 'Shangpi-Lar, '180", '5300", 'Varansai', '8.6"),
('H1811", 'Gound Seasons', '190", '5300", 'Gunyara', '8.8"),
('H1811", 'Gound Seasons', '190", '5300", 'Gunyara', '8.8"),
('H1812", 'The Leela', '1170", '5700", 'Wadodara', '8.2"),
('H1812", 'Houlday Inn', '200", '5400", 'Ranjur', '8.7"),
('H1812", 'Houlday Inn', '200", '5400", 'Ranjur', '8.2"),
('H1812", 'Houlday Inn', '200", '5400", 'Ranjur', '8.2"),
('H1922", 'Houlday Inn', '200", '5400", 'Ranjur', '8.9"),
('H1922", 'Houlday Inn', '200", '5400", 'Ranjur', '8.2"),
('H1922", 'Houlday Inn', '200", '5400", 'Ranjur', '8.2"),
('H1922", 'Houlday Inn', '200", '5400", 'Ranjur', '8.2"),
('H1922", 'Ranjur', 'Ranjur',
          Itinerary_id VARCHAR(512),
Title VARCHAR(512),
Budget INT,
Country VARCHAR(512),
State VARCHAR(512),
City VARCHAR(512),
Parting OURS 15
                              | TIMON | Timerary (Itinerary id, Title, Budget, Country, State, City, Rating, No. of Travellers, FoodPreference, Transport_id, Hotel_id, Date_Of_Travel) VALUES (TIMON), 'Exploring Rumbai', '5800', 'India', 'Maharashtra', 'Mumbai', '4.2', '2', 'Vegetarian', 'Fila01', '15-06-24'), 'ITI001', 'Exploring Rumbai', '5800', 'India', 'Maharashtra', 'Mumbai', '4.2', '2', 'Vegetarian', 'Fila01', '15-06-24'), 'ITI001', 'Bengkheeing in Paris', '8800', 'France, 'Ile-de-France', 'Paris', '4.5', '4', 'NeaFood', 'Fil002', 'HI1001', '15-06-24'), 'ITI001', 'New New North Control of the C
```

```
| VALUES ('TP1001', 'India', 'Maharashtra', 'Mumbai');
| VALUES ('TP1002', 'India', 'Delhi', 'New Delhi');
| VALUES ('TP1002', 'India', 'Delhi', 'New Delhi');
| VALUES ('TP1004', 'India', 'Asail Madri, 'Dehenis');
| VALUES ('TP1004', 'India', 'West Bengal', 'Kolkata');
| VALUES ('TP1006', 'India', 'West Bengal', 'Kolkata');
| VALUES ('TP1006', 'India', 'Reajsathan', 'Jaipun');
| VALUES ('TP1008', 'India', 'Itlangnan', 'Hyderabad');
| VALUES ('TP1008', 'India', 'Uttar Pradesh', 'Lucknow');
| VALUES ('TP1018', 'India', 'Himachal Pradesh', 'Shimla');
| VALUES ('TP1012', 'India', 'Punjab', 'Chandigarh');
| VALUES ('TP1012', 'India', 'Punjab', 'Chandigarh');
| VALUES ('TP1012', 'India', 'Sasai' (Signar') hanthappara');
| VALUES ('TP1012', 'India', 'Sasai' (Signar') hanthappara');
| VALUES ('TP1015', 'India', 'Sasai' (Signar') hanthappara');
| VALUES ('TP1015', 'India', 'Sasai' (Signar') hanthappara');
| VALUES ('TP1015', 'India', 'Walues', 'Para');
| VALUES ('TP1027', 'France', 'Ila-de-France', 'Pari');
| VALUES ('TP1027', 'Irdia', 'Values', 'Para');
| VALUES ('TP1027', 'Irdia', 'Tokyn', 'Tokyn'
```

```
User_Id VARCHAR(512),
Name VARCHAR(512),
Password VARCHAR(512),
Dob VARCHAR(512),
Email_Id VARCHAR(512),
Address VARCHAR(512)
```

Project: Itinerary Management System REG.NO: 221080076 & 221081009

| Section | Common |

COURSE INSTRUCTOR: Dr V.B Nikam

Database Created:

Output:

https://gist.github.com/Adityay9/a73b8c4562dd2c702f7038b17845fbbf#filedatabase__creation_output-txt Project : Itinerary Management System COURSE INSTRUCTOR : Dr V.B Nikam

REG.NO: 221080076 & 221081009

SQL-DML and Complex Queries

SQL-DML for manipulating data:

Data Manipulation Language (DML):

Use **INSERT, UPDATE, and DELETE** statements to manipulate data in the tables. **SELECT** statement retrieves data from one or more tables.

Aggregate Functions:

Functions like **AVG**, **SUM**, **COUNT**, **MIN**, **and MAX** operate on a set of values to return a single value.

They are often used with GROUP BY clause to perform aggregate operations on groups of rows.

Complex Queries:

Combining multiple SELECT statements using UNION, INTERSECT, or EXCEPT. Using subqueries to nest one query within another, typically within WHERE or FROM clauses.

Join Queries:

Use **JOIN** clause to retrieve data from multiple related tables simultaneously. Different types of joins include **INNER JOIN, LEFT JOIN, RIGHT JOIN, and FULL JOIN.** Sorting:

Use **ORDER BY** clause to sort query results based on one or more columns. Sorting can be in ascending (default) or descending order.

Grouping:

Use **GROUP BY** clause to group rows that have the same values into summary rows. Aggregate functions are often used in conjunction with GROUP BY to perform calculations on grouped data.

Project: Itinerary Management System COURSE INSTRUCTOR: Dr V.B Nikam

REG.NO: 221080076 & 221081009

LIMIT: Specifies the maximum number of records to return.

SUM(): An aggregate function that returns the sum of all or distinct values in a set.

IN: Allows you to specify multiple values in a WHERE clause.

INNER JOIN: Returns records that have matching values in both tables.

ON: Used to join tables based on a related column between them.

UPDATE: Used to modify the existing records in a table.

SET: Used with UPDATE to specify the new value of the column.

WHERE: Used to filter records.

DELETE: Used to delete existing records from a table.

INSERT INTO: Used to insert new records into a table.

VALUES: Specifies the values of an INSERT INTO statement.

ALTER TABLE: Used to add, delete/drop or modify columns in an existing table.

ADD COLUMN: Used with ALTER TABLE to add new columns into a table.

CREATE TABLE: Used to create a new table.

DROP TABLE: Used to delete a table.

TRUNCATE TABLE: Used to delete the data inside a table, but not the table itself.

RENAME TABLE: Used to rename a table.

GRANT: Gives users permission to perform certain tasks.

REVOKE: Takes back permissions from users.

Project: Itinerary Management System COURSE INSTRUCTOR: Dr V.B Nikam

REG.NO: 221080076 & 221081009

COMMIT: Saves all changes made in the current transaction.

ROLLBACK: Rolls back an explicit or implicit transaction to the beginning of the

transaction, or to a savepoint inside the transaction

```
Find the average budget of all itineraries
SELECT AVG(Budget) AS AverageBudget FROM Itinerary;
-- Find the total number of users with the same blood group
SELECT Blood_group, COUNT(*) AS NumberOfUsers FROM User_Profile GROUP BY Blood_group;
 -- Find the maximum wallet balance among all user accounts
SELECT MAX(Wallet) AS MaxWalletBalance FROM User_Account;
-- Find the minimum, maximum, and average hotel cost
SELECT MIN(Cost) AS MinCost, MAX(Cost) AS MaxCost, AVG(Cost) AS AverageCost FROM Hotel;
 -- Find the top 5 most expensive itineraries
SELECT * FROM Itinerary ORDER BY Budget DESC LIMIT 5;
-- Find the number of itineraries per country
SELECT Country, COUNT(*) AS NumberOfItineraries FROM Itinerary GROUP BY Country;
-- Find the total amount billed per user
SELECT User_Id, SUM(Amount) AS TotalAmount FROM Bill GROUP BY User_Id;
-- Find the number of users per climate preference
SELECT Climate, COUNT(*) AS NumberOfUsers FROM User_Preference GROUP BY Climate;
-- Find the top 3 most preferred transport types by users
SELECT Transport_Preference, COUNT(*) AS NumberOfUsers FROM User_Preference GROUP BY Transport_Preference ORDER BY NumberOfUsers DESC LIMIT
 -- Find the average rating of hotels
SELECT AVG(Rating) AS AverageRating FROM Hotel;
-- Find the number of tourist places per city
SELECT City, COUNT(*) AS NumberOfPlaces FROM Tourist_Places GROUP BY City;
-- Find the names of users who have the maximum wallet balance

SELECT Name FROM User WHERE User_Id IN (SELECT User_Id FROM User_Account WHERE Wallet = (SELECT MAX(Wallet) FROM User_Account));
SELECT User.Name FROM User INNER JOIN (SELECT User_Id, MAX(Wallet) AS MaxWallet FROM User_Account GROUP BY User_Id) AS MaxWallets
-- Find the names of users who have travelled to the most popular tourist place
SELECT User.Name FROM User INNER JOIN Itinerary ON User.User_Id = Itinerary.User_Id WHERE Itinerary.City = (SELECT City FROM Tourist_Places GROUP BY City ORDER BY COUNT(*) DESC LIMIT 1);
-- Find the names of users who have stayed in the highest rated hotel

SELECT User.Name FROM User INNER JOIN Itinerary ON User.User_Id = Itinerary.User_Id WHERE Itinerary.Hotel_id = (SELECT Hotel_id FROM Hotel

ORDER BY Rating DESC LIMIT 1);
-- Find the total amount spent by each user
SELECT User.Name, SUM(Bill.Amount) AS TotalSpent FROM User INNER JOIN Bill ON User.User_Id = Bill.User_Id GROUP BY User.Name;
-- Find the average rating of itineraries for each country SELECT Country, AVG(Rating) AS AverageRating FROM Itinerary GROUP BY Country;
-- Find the most preferred food preference among users
SELECT FoodPreference, COUNT(*) AS NumberOfUsers FROM User_Preference GROUP BY FoodPreference ORDER BY NumberOfUsers DESC LIMIT 1;
 -- Find the total number of users who have a preference for each climate
SELECT Climate, COUNT(*) AS NumberOfUsers FROM User_Preference GROUP BY Climate;
 JPDATE User SET Name = 'Aditya Yedurkar' WHERE User_Id = 'U001';
 JPDATE User_Account SET Wallet = 50000 WHERE User_Id = 'U001';
 PDATE User_Preference SET Budget = 200000 WHERE User_Id = 'U001';
 PDATE Itinerary SET Budget = 250000 WHERE User_Id = 'U001';
```

Project: Itinerary Management System REG.NO: 221080076 & 221081009

```
UPDATE Bill SET Amount = 30000 WHERE User_Id = 'U001';

DELETE FROM User WHERE User_Id = 'U002';

INSERT INTO User (User_Id, Name, Email, Phone) VALUES ('U1051', 'Aditya Yedurkar', 'aditya.yedurkar@gmail.com', '9876543210', 'Mumbai');

ALTER TABLE User ADD COLUMN Email VARCHAR(255);

CREATE TABLE Address ( Address_Id INT PRIMARY KEY, Street VARCHAR(255), City VARCHAR(255), State VARCHAR(255), Country VARCHAR(255) );

DROP TABLE User_Preference;

TRUNCATE TABLE Itinerary;

RENAME TABLE User TO Users;

GRANT SELECT, INSERT, UPDATE, DELETE ON Users TO 'admin'@'localhost';

REVOKE INSERT, UPDATE ON Users FROM 'root'@'localhost';

COMMIT;
```

COURSE INSTRUCTOR: Dr V.B Nikam

Output:

https://gist.github.com/Adityay9/a73b8c4562dd2c702f7038b17845fbbf#file-dml-txt

Nested Query:

- This guery retrieves the names of users who have the maximum wallet balance.
- It uses a subquery to find the maximum wallet balance from the User_Account table, then filters the User table based on the User_Id associated with that maximum balance.

Join Query:

- This query finds the names of users who have stayed in the highest-rated hotel.
- It utilizes a join between the User and Itinerary tables on the User_Id column, then filters the Itinerary table
 based on the hotel with the highest rating.

Aggregate Function:

- This guery calculates the average budget of all itineraries.
- It employs the AVG aggregate function to compute the average of the Budget column from the Itinerary table.

Complex Query:

- This guery determines the total amount spent by each user.
- o It combines the User and Bill tables using an inner join on the User_Id column and then sums up the Amount column from the Bill table for each user, displaying the total spent.

Aggregate Function with Group By:

Project: Itinerary Management System REG.NO: 221080076 & 221081009

COURSE INSTRUCTOR: Dr V.B Nikam

- o This query counts the number of itineraries per country.
- o It utilizes the COUNT aggregate function along with GROUP BY to count the number of rows (itineraries) for each distinct country in the Itinerary table.

Complex Query with Aggregate Function and Group By:

- This guery finds the top 3 most preferred transport types by users.
- o It groups the data in the User_Preference table by Transport_Preference, counts the occurrences of each transport type using COUNT, then sorts the results in descending order and limits it to the top 3 rows.

```
-- Nested Query: Find the names of users who have the maximum wallet balance

SELECT Name FROM User WHERE User_Id IN (SELECT User_Id FROM User_Account WHERE Wallet = (SELECT MAX(Wallet) FROM User_Account));

-- Join Query: Find the names of users who have stayed in the highest rated hotel

SELECT User.Name FROM User INNER JOIN Itinerary ON User.User_Id = Itinerary.User_Id WHERE Itinerary.Hotel_id = (SELECT Hotel_id FROM Hotel

ORDER BY Rating DESC LIMIT 1);

-- Aggregate Function: Find the average budget of all itineraries

SELECT AVG(Budget) AS AverageBudget FROM Itinerary;

-- Complex Query: Find the total amount spent by each user

SELECT User.Name, SUM(Bill.Amount) AS TotalSpent FROM User INNER JOIN Bill ON User.User_Id = Bill.User_Id GROUP BY User.Name;

-- Aggregate Function with Group By: Find the number of itineraries per country

SELECT Country, COUNT(*) AS NumberOfItineraries FROM Itinerary GROUP BY Country;

-- Complex Query with Aggregate Function and Group By: Find the top 3 most preferred transport types by users

SELECT Transport_Preference, COUNT(*) AS NumberOfUsers FROM User_Preference GROUP BY Transport_Preference ORDER BY NumberOfUsers DESC LIMIT 3;
```

Output:

https://gist.github.com/Adityay9/a73b8c4562dd2c702f7038b17845fbbf#file-nested-txt

Aditya Yedurkar, 221080076

Aditi Chhajed, 221081009

