

SQL Exercise on Traffic Data Management

Objective:

Apply SQL operations to manage and analyze traffic data stored in relational databases.

Instructions:

Write SQL queries to perform the following tasks related to managing traffic data.

Tasks:

1. Table Creation:

- Create a table named `traffic_data` with columns:
 - `road` (VARCHAR)
 - `date` (DATE)
 - `time` (TIME)
 - `traffic_volume` (INTEGER)
 - Include additional columns for `weather_condition` (VARCHAR) and `vehicle_type_breakdown` (JSON or VARCHAR).

2. Insert Operations:

- Insert traffic data into the `traffic_data` table for a road section:
 - Road: "Highway A1"
 - Date: "2024-07-11"
 - Time: "08:00"
 - Traffic Volume: 1200 vehicles
 - Weather Condition: "Clear"
 - Vehicle Type Breakdown: '{"car": 800, "truck": 300, "motorcycle": 100}'

3. Query Operations:

- Write a query to retrieve all columns for the first recorded traffic data in the table.
- Write a query to find and display all records where the traffic volume is greater than 1000 vehicles. Include weather conditions and vehicle type breakdown in the results.

4. Update Operations:

- Update the traffic volume to 1500 vehicles for all records where the road is "Highway A1" and the time is between "08:00" and "10:00" on "2024-07-11".
- Update the vehicle type breakdown to '{"car": 850, "truck": 320, "motorcycle": 130}' for the record with the highest traffic volume.

5. Delete Operations:

- Delete all records where the weather condition is "Rainy".
- Delete records where the traffic volume is less than 500 vehicles and the date is before "2024-07-11".

Example Table Creation SQL:

```
CREATE TABLE traffic_data (  
  road VARCHAR(50),  
  date DATE,  
  time TIME,  
  traffic_volume INTEGER,  
  weather_condition VARCHAR(20),  
  vehicle_type_breakdown JSON  
);
```