SQL Developer Internship
Task 7: Creating Views

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Task Overview

Objective: Learn to create and use views.
Tools: DB Browser for SQLite / MySQL Workbench.
Deliverables: View definitions and usage examples.

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1 Introduction to Views

A **View** is a virtual table based on the result-set of an SQL statement. It contains rows and columns, just like a real table. The fields in a view are fields from one or more real tables in the database.

Views are useful for:

- **Simplification:** Encapsulating complex queries (like Joins) so users can query the view easily.
- **Security:** Restricting access to specific columns (e.g., hiding salaries) while allowing access to others.

2 Hypothetical Database Schema

To demonstrate the creation of views, we assume the following existing tables:

- `employees` (id, first_name, last_name, email, salary, department_id)
- `departments` (department_id, department_name, location)

3 Deliverable 1: Complex SELECT View (Simplification)

Goal: Create a view that joins the `employees` and `departments` tables to show a complete profile for each employee, including their department name, without needing to write the JOIN every time.

SQL Definition

```sql
CREATE VIEW Employee_Details_Full AS
SELECT
    e.id AS EmployeeID,
    e.first_name || ' ' || e.last_name AS FullName,
    e.email AS Email,
    d.department_name AS Department,
    d.location AS OfficeLocation
FROM
    employees e
JOIN
    departments d ON e.department_id = d.department_id;
```

Usage Example

Once the view is created, we can query it as if it were a simple table:

```sql
-- Select all details from the view
SELECT * FROM Employee_Details_Full;

-- Filter the view for specific locations
SELECT * FROM Employee_Details_Full
WHERE OfficeLocation = 'New York';
```

4 Deliverable 2: Security View (Abstraction)

Goal: Create a view for general staff or a public directory. This view should expose contact information but **must hide sensitive data** like the `salary` column.

SQL Definition

```sql
CREATE VIEW Public_Directory AS
SELECT
    first_name,
    last_name,
    email,
    department_id
FROM
    employees;
```

Usage Example

A user querying this view cannot see the salary column, ensuring data privacy.

```sql
-- Retrieve the public directory
SELECT * FROM Public_Directory;

-- Trying to select salary from this view would result in an error
-- SELECT salary FROM Public_Directory; -- Error: Column not found
```

5 Deliverable 3: Aggregated View (Reporting)

Goal: Create a view that provides a summary of payroll expenses per department.

SQL Definition

```sql
CREATE VIEW Department_Payroll_Summary AS
SELECT
    d.department_name,
    COUNT(e.id) AS Total_Employees,
    AVG(e.salary) AS Average_Salary,
    SUM(e.salary) AS Total_Budget
FROM
    departments d
LEFT JOIN
    employees e ON d.department_id = e.department_id
GROUP BY
    d.department_name;
```

Usage Example

```sql
-- Quickly analyze department budgets
SELECT * FROM Department_Payroll_Summary
ORDER BY Total_Budget DESC;
```