0.9 Creating Queries

you-said

For this Schema: Person (driver_id, name, address) - Primary Keys (driver_id) Car (license_plate, model, year) - Primary Keys (license_plate) Accident (report_number, year, location) - Primary Keys (report_number) Own (driver_id, license_plate) - Primary Keys (driver_id, license_plate) Participated (report_number, license_plate, driver_id, damage_amount) - Primary Keys (report_number, license_plate) Write a query to find the total number of people who owned cars that were involved in accidents in 2017.

ChatGPT said:

To find the total number of people who owned cars that were involved in accidents in 2017, you can join the `Own`, `Participated`, and `Accident` tables, filtering for accidents that occurred in 2017, and then count the distinct number of people (`driver_id`).

Here's the SQL query:

[] sqlCopy codeSELECT COUNT(DISTINCT O.driver_id) AS total_people FROM Own O JOIN Participated P ON O.license_plate = P.license_plate JOIN Accident A ON P.report_number = A.report_number WHERE A.year = 2017;

explanation

Explanation:

- `Own O`: Contains information about which cars are owned by which people.
- `Participated P`: Contains details of cars and drivers involved in accidents.
- `Accident A`: Contains accident details like the year and location.
- The query joins these three tables on `license_plate` and `report_number`, and filters by accidents that occurred in 2017 (`A.year = 2017`).
- `COUNT(DISTINCT O.driver_id)`: Ensures that the count only includes unique car owners.

you-said-1

write a query to delete all 2010 cars belonging to a person whose ID is '12345'

ChatGPT said:

To delete all cars from the `Car` table that belong to a person with `driver_id = '12345'` and were manufactured in the year 2010, you'll need to use a `DELETE` query that involves a join between the `Car` and `Own` tables.

Here's the SQL query:

[] sqlCopy codeDELETE FROM Car WHERE license_plate IN (SELECT O.license_plate FROM Own O JOIN Car C ON O.license_plate = C.license_plate WHERE O.driver_id = '12345' AND C.year = 2010);

explanation-1

Explanation:

- The `DELETE` statement is targeting rows in the `Car` table.
- The subquery finds all the `license_plate` values from the `Own` table that are owned by the person with `driver_id = '12345'` and where the car's `year` is 2010.
- The `WHERE` clause of the main query then deletes all cars that match the `license_plate` values from the subquery.

This ensures that only the cars from 2010 owned by the person with ID `12345` are deleted.

you-said-2

what is the difference between this query "DELETE FROM Car WHERE license_plate IN (SELECT O.license_plate FROM Own O JOIN Car C ON O.license_plate = C.license_plate WHERE O.driver_id = '12345' AND C.year = 2010); " and "Delete Car Where year = 2010 and license_plate in (Select license_plate FROM Owns o Where o.driver_id = '12345') Which is better?

ChatGPT said:

Both queries aim to delete cars from the `Car` table that belong to a person with `driver_id = '12345'` and were manufactured in the year 2010. However, they differ slightly in their structure and execution. Let's break down each query and compare them:

query-1

Query 1:

[] sqlCopy codeDELETE FROM Car WHERE license_plate IN (SELECT O.license_plate FROM Own O JOIN Car C ON O.license_plate = C.license_plate WHERE O.driver_id = '12345' AND C.year = 2010);

- **Subquery**: This subquery joins the `Own` and `Car` tables to first filter the `license_plate` for cars owned by `driver_id = '12345'` and manufactured in the year 2010.
- **Delete Condition**: The main query deletes all records from `Car` where the `license_plate` matches the result of the subquery.

query-2

Query 2:

[] sqlCopy codeDELETE FROM Car WHERE year = 2010 AND license_plate IN (SELECT license_plate FROM Own O WHERE O.driver_id = '12345');

- **Subquery**: This subquery directly selects the `license_plate` from the `Own` table for the person with `driver_id = '12345'`.
- **Delete Condition**: The main query deletes cars from `Car` where the `license_plate` is owned by the person and the car's `year` is 2010.

key-differences

Key Differences:

1. **Join vs. Filtering**:
    - **Query 1**: Performs an explicit `JOIN` between `Own` and `Car` in the subquery to check both ownership and the car's year in the same step.
    - **Query 2**: Separates the logic by filtering the year directly in the main query and selecting only based on ownership in the subquery.
2. **Efficiency**:
    - **Query 1**: Could potentially be less efficient because it performs a `JOIN` in the subquery, which might slow down performance if the tables are large.
    - **Query 2**: Is likely more efficient because it directly checks the `year = 2010` in the main query and only looks for ownership in the subquery. This reduces the complexity of the subquery and narrows down the cars earlier.

which-is-better

Which is Better?

Query 2 is likely better in terms of performance because:

- It avoids a `JOIN` in the subquery, making the filtering process more straightforward.

- The condition `year = 2010` is applied directly in the `DELETE` statement, reducing the number of rows processed in the subquery.

However, both queries will yield the same result. If performance isn't a major concern (for small datasets), either approach works fine. But for larger datasets, **Query 2** is generally the preferred option.

you-said-3

University Schema and Data.pdf
PDF

create a relation marks(ID, score) and populate it with random score for all student's courses that conforms with the grades of the students. Where grade is F if score < 40, grade is C if 40 <= score < 60, grade is B if 60 <= score < 80 and grade is A is 80 <= score. Use University Schema and Data.

section

To create a `Marks` relation and populate it with random scores that conform to the grade data in the `Takes` table from the University Schema, follow these steps:

1. **Create the `Marks` table**:

   [] sqlCopy codeCREATE TABLE Marks (ID VARCHAR(5), score INT CHECK (score >= 0 AND score <= 100), PRIMARY KEY (ID));

2. **Insert random scores** for all students' courses and map them to grades. Based on the given grade system:

   - **F** if score < 40
   - **C** if 40 <= score < 60
   - **B** if 60 <= score < 80
   - **A** if 80 <= score <= 100

3. **Generate random scores** and populate the `Marks` table based on the grades. Use SQL to insert the scores into the table, matching the grade conditions from the `Takes` table. You can assign random values within the score ranges for each grade.

Here is an example script to insert random scores based on the existing grades in the `Takes` table:

[] sqlCopy code-- Insert random scores into Marks based on the student's grades from the Takes table INSERT INTO Marks (ID, score) SELECT T.ID, CASE WHEN T.grade

= 'A' THEN FLOOR(RANDOM() * (100 - 80 + 1)) + 80 -- Random score between 80 and 100 WHEN T.grade = 'B' THEN FLOOR(RANDOM() * (79 - 60 + 1)) + 60 -- Random score between 60 and 79 WHEN T.grade = 'C' THEN FLOOR(RANDOM() * (59 - 40 + 1)) + 40 -- Random score between 40 and 59 WHEN T.grade = 'F' THEN FLOOR(RANDOM() * (39 - 0 + 1)) + 0 -- Random score between 0 and 39 ELSE NULL -- Handle null or unknown grades END AS score FROM Takes T;

explanation-2

Explanation:

- **Random score generation**: `FLOOR(RANDOM() * (upper_limit - lower_limit + 1)) + lower_limit` generates a random integer within the specified range for each grade.
- **Grades**: Based on the `Takes` table, scores are assigned according to the grading system.

This will populate the `Marks` table with random scores that correspond to each student's grade for their respective courses.

you-said-4

in SQL create a new relation marks(ID, score) and populate it with random data for 10 students.

ChatGPT said:

To create a new `Marks` relation and populate it with random data for 10 students in SQL, you can follow these steps:

1. **Create the `Marks` table**:

   [] sqlCopy codeCREATE TABLE Marks (ID VARCHAR(5), score INT CHECK (score >= 0 AND score <= 100), PRIMARY KEY (ID));

2. **Insert random scores for 10 students** using random data generation. The `RANDOM()` function generates a random float between 0 and 1, and we can scale it to get a score between 0 and 100.

Here's the SQL script to insert random scores for 10 students:

[] sqlCopy code-- Create the Marks table CREATE TABLE Marks (ID VARCHAR(5), score INT CHECK (score >= 0 AND score <= 100), PRIMARY KEY (ID));

-- Insert random scores for 10 students INSERT INTO Marks (ID, score) VALUES ('S001', FLOOR(RANDOM() * 101)), -- Random score between 0 and 100 ('S002', FLOOR(RANDOM() * 101)), ('S003', FLOOR(RANDOM() * 101)), ('S004', FLOOR(RANDOM()

* 101)), ('S005', FLOOR(RANDOM() * 101)), ('S006', FLOOR(RANDOM() * 101)), ('S007', FLOOR(RANDOM() * 101)), ('S008', FLOOR(RANDOM() * 101)), ('S009', FLOOR(RANDOM() * 101)), ('S010', FLOOR(RANDOM() * 101));

explanation-3

Explanation:

- `FLOOR(RANDOM() * 101)`: This generates a random integer between 0 and 100 for each student's score.
- The `ID` values are hardcoded as `S001`, `S002`, etc., representing the student IDs.

This query creates the `Marks` table and populates it with random scores for 10 students.

you-said-5

Here grade is F if score < 40, grade is C if 40 <= score < 60, grade is B if 60 <= score < 80 and grade is A is 80 <= score. Write a query to find number of students with each grade.

ChatGPT said:

To find the number of students with each grade based on their scores, you can use a `CASE` statement to categorize the `score` into the corresponding grade (`F`, `C`, `B`, `A`). Then, you can use `GROUP BY` to count the number of students in each grade category.

Here's the SQL query:

[] sqlCopy codeSELECT CASE WHEN score < 40 THEN 'F' WHEN score >= 40 AND score < 60 THEN 'C' WHEN score >= 60 AND score < 80 THEN 'B' WHEN score >= 80 THEN 'A' END AS grade, COUNT(*) AS number_of_students FROM Marks GROUP BY grade;

explanation-4

Explanation:

- The `CASE` statement checks the `score` and assigns the appropriate grade:
  - **F** if `score < 40`
  - **C** if `40 <= score < 60`
  - **B** if `60 <= score < 80`
  - **A** if `80 <= score`
- The `COUNT(*)` counts the number of students in each grade category.

- The query groups the result by the `grade` to show the number of students for each grade.

This query will return the number of students in each grade category (`A`, `B`, `C`, `F`).
you-said-6

For this Employee Schema Employee (id, person_name, street, city) - Primary Keys (id) Works (id, company_name, salary) - Primary Keys (id) Company (company_name, city) - Primary Keys (company_name) Manages (id, manager_id) - Primary Keys (id) write a query to find the id, name, city of residence of each employee who works for "First Bank Corporation" and earns more than $10,000.

ChatGPT said:

To find the `id`, `person_name`, and `city` of residence of each employee who works for the company "First Bank Corporation" and earns more than $10,000, you need to join the `Employee` and `Works` tables and apply the relevant conditions.

Here's the SQL query:

[] sqlCopy codeSELECT E.id, E.person_name, E.city FROM Employee E JOIN Works W ON E.id = W.id WHERE W.company_name = 'First Bank Corporation' AND W.salary > 10000;

explanation-5

Explanation:

- `Employee E`: Contains employee details like `id`, `person_name`, and `city`.
- `Works W`: Contains information about where employees work, including their `salary` and `company_name`.
- The `JOIN` is done on `id` to match employees with their work details.
- The `WHERE` clause filters employees who work for **"First Bank Corporation"** and have a salary greater than $10,000.

This query returns the `id`, `person_name`, and `city` of residence for all employees who meet the specified criteria.

you-said-7

For this Employee Schema Employee (id, person_name, street, city) - Primary Keys (id) Works (id, company_name, salary) - Primary Keys (id) Company (company_name, city) - Primary Keys (company_name) Manages (id, manager_id) - Primary Keys (id) write a query to find the id of each employee who earns more than every employee of "Small Bank Corporation"

ChatGPT said:

To find the `id` of each employee who earns more than every employee of **"Small Bank Corporation"**, you need to compare the salary of employees in other companies to the highest salary of employees working for **"Small Bank Corporation"**.

You can achieve this using a `WHERE` clause that ensures the employee's salary is greater than the maximum salary of employees at **"Small Bank Corporation"**.

Here's the SQL query:

[] sqlCopy codeSELECT W1.id FROM Works W1 WHERE W1.salary > (SELECT MAX(W2.salary) FROM Works W2 WHERE W2.company_name = 'Small Bank Corporation');

explanation-6

Explanation:

- `Works W1`: Represents all employees' work details, including their `salary`.
- **Subquery**: The subquery finds the maximum salary of employees working for **"Small Bank Corporation"**.
- **Main Query**: The main query selects the `id` of employees whose salary is greater than the maximum salary found in the subquery.

This query will return the `id` of each employee who earns more than every employee working for **"Small Bank Corporation"**.

you-said-8

University Schema and Data.pdf

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Write a query to Display a list of all instructors, showing each instructor's ID and the number of sections taught. Make sure to show the number of sections as 0 for instructors who have not taught any section. Your query should use an outer join, and should not use subqueries. Write the query on University Schema and Data

section-1

To display the list of all instructors, showing each instructor's `ID` and the number of sections taught, including instructors who have not taught any sections (with the count as 0), you can use an **outer join** between the `instructor` and `teaches` tables.

Here is the SQL query to achieve this:

[] sqlCopy codeSELECT I.ID, I.name, COUNT(T.course_id) AS number_of_sections FROM instructor I LEFT JOIN teaches T ON I.ID = T.ID GROUP BY I.ID, I.name;

explanation-7

Explanation:

- `LEFT JOIN`: This ensures that all instructors from the `instructor` table are included in the result, even if they do not have matching records in the `teaches` table.
- `COUNT(T.course_id)`: Counts the number of sections each instructor has taught. If the instructor has not taught any sections, the count will be 0.
- `GROUP BY I.ID, I.name`: Groups the results by the instructor's `ID` and `name` to aggregate the section count for each instructor.

This query will return a list of instructors with their ID, name, and the number of sections they have taught, with a count of 0 for those who haven't taught any sections.

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