

Leetcode-Database 题解

原作者github: <https://github.com/CyC2018/CS-Notes>

PDF制作github: <https://github.com/sjsdfg/CS-Notes-PDF>

595. Big Countries

<https://leetcode.com/problems/big-countries/description/>

Description

name	continent	area	population	gdp
Afghanistan	Asia	652230	25500100	20343000
Albania	Europe	28748	2831741	12960000
Algeria	Africa	2381741	37100000	188681000
Andorra	Europe	468	78115	3712000
Angola	Africa	1246700	20609294	100990000

查找面积超过 3,000,000 或者人口数超过 25,000,000 的国家。

name	population	area
Afghanistan	25500100	652230
Algeria	37100000	2381741

SQL Schema

```
DROP TABLE IF EXISTS World;
CREATE TABLE World ( NAME VARCHAR ( 255 ), continent VARCHAR ( 255 ), area INT, population INT, gdp INT );
INSERT INTO World ( NAME, continent, area, population, gdp )
VALUES
    ( 'Afghanistan', 'Asia', '652230', '25500100', '20343000' ),
    ( 'Albania', 'Europe', '28748', '2831741', '12960000' ),
    ( 'Algeria', 'Africa', '2381741', '37100000', '188681000' ),
    ( 'Andorra', 'Europe', '468', '78115', '3712000' ),
    ( 'Angola', 'Africa', '1246700', '20609294', '100990000' );
```

Solution

```
SELECT name,
       population,
       area
FROM   World
WHERE  area > 3000000
       OR population > 25000000;
```

627. Swap Salary

<https://leetcode.com/problems/swap-salary/description/>

Description

id	name	sex	salary
1	A	m	2500
2	B	f	1500
3	C	m	5500
4	D	f	500

只用一个 SQL 查询，将 sex 字段反转。

id	name	sex	salary
1	A	f	2500
2	B	m	1500
3	C	f	5500
4	D	m	500

SQL Schema

```
DROP TABLE
IF
    EXISTS salary;
CREATE TABLE salary ( id INT, NAME VARCHAR ( 100 ), sex CHAR ( 1 ), salary INT );
INSERT INTO salary ( id, NAME, sex, salary )
VALUES
    ( '1', 'A', 'm', '2500' ),
    ( '2', 'B', 'f', '1500' ),
    ( '3', 'C', 'm', '5500' ),
    ( '4', 'D', 'f', '500' );
```

Solution

```
UPDATE salary
SET sex = CHAR ( ASCII(sex) ^ ASCII( 'm' ) ^ ASCII( 'f' ) );
```

620. Not Boring Movies

<https://leetcode.com/problems/not-boring-movies/description/>

Description

id	movie	description	rating
1	War	great 3D	8.9
2	Science	fiction	8.5
3	irish	boring	6.2
4	Ice song	Fantasy	8.6
5	House card	Interesting	9.1

查找 id 为奇数，并且 description 不是 boring 的电影，按 rating 降序。

5	House card	Interesting	9.1
1	War	great 3D	8.9

SQL Schema

```
DROP TABLE
IF
    EXISTS cinema;
CREATE TABLE cinema ( id INT, movie VARCHAR ( 255 ), description VARCHAR ( 255 ), rating FLOAT (
2, 1 ) );
INSERT INTO cinema ( id, movie, description, rating )
VALUES
    ( 1, 'War', 'great 3D', 8.9 ),
    ( 2, 'Science', 'fiction', 8.5 ),
    ( 3, 'irish', 'boring', 6.2 ),
    ( 4, 'Ice song', 'Fantasy', 8.6 ),
    ( 5, 'House card', 'Interesting', 9.1 );
```

Solution

```
SELECT
    *
FROM
    cinema
WHERE
    id % 2 = 1
    AND description != 'boring'
ORDER BY
    rating DESC;
```

596. Classes More Than 5 Students

<https://leetcode.com/problems/classes-more-than-5-students/description/>

Description

student	class
A	Math
B	English
C	Math
D	Biology
E	Math
F	Computer
G	Math
H	Math
I	Math

查找有五名及以上 student 的 class。

class
Math

SQL Schema

```
DROP TABLE
IF
    EXISTS courses;
CREATE TABLE courses ( student VARCHAR ( 255 ), class VARCHAR ( 255 ) );
```

```
INSERT INTO courses ( student, class )
VALUES
    ( 'A', 'Math' ),
    ( 'B', 'English' ),
    ( 'C', 'Math' ),
    ( 'D', 'Biology' ),
    ( 'E', 'Math' ),
    ( 'F', 'Computer' ),
    ( 'G', 'Math' ),
    ( 'H', 'Math' ),
    ( 'I', 'Math' );
```

Solution

```
SELECT
    class
FROM
    courses
GROUP BY
    class
HAVING
    count( DISTINCT student ) >= 5;
```

182. Duplicate Emails

<https://leetcode.com/problems/duplicate-emails/description/>

Description

邮件地址表:

```
+-----+-----+
| Id | Email |
+-----+-----+
| 1 | a@b.com |
| 2 | c@d.com |
| 3 | a@b.com |
+-----+-----+
```

查找重复的邮件地址:

```
+-----+
| Email |
+-----+
| a@b.com |
+-----+
```

SQL Schema

```
DROP TABLE
IF
    EXISTS Person;
CREATE TABLE Person ( Id INT, Email VARCHAR ( 255 ) );
INSERT INTO Person ( Id, Email )
VALUES
    ( 1, 'a@b.com' ),
    ( 2, 'c@d.com' ),
    ( 3, 'a@b.com' );
```

Solution

```
SELECT
    Email
FROM
    Person
GROUP BY
    Email
HAVING
    COUNT( * ) >= 2;
```

196. Delete Duplicate Emails

<https://leetcode.com/problems/delete-duplicate-emails/description/>

Description

邮件地址表:

```
+----+-----+
| Id | Email |
+----+-----+
| 1  | a@b.com |
| 2  | c@d.com |
| 3  | a@b.com |
+----+-----+
```

删除重复的邮件地址:

```
+-----+-----+
| Id | Email           |
+-----+-----+
| 1  | john@example.com |
| 2  | bob@example.com  |
+-----+-----+
```

SQL Schema

与 182 相同。

Solution

连接:

```
DELETE p1
FROM
    Person p1,
    Person p2
WHERE
    p1.Email = p2.Email
    AND p1.Id > p2.Id
```

子查询:

```
DELETE
FROM
    Person
WHERE
    id NOT IN ( SELECT id FROM ( SELECT min( id ) AS id FROM Person GROUP BY email ) AS m );
```

应该注意的是上述解法额外嵌套了一个 SELECT 语句，如果不这么做，会出现错误：You can't specify target table 'Person' for update in FROM clause。以下演示了这种错误解法。

```
DELETE
FROM
    Person
WHERE
    id NOT IN ( SELECT min( id ) AS id FROM Person GROUP BY email );
```

参考: [pMySQL Error 1093 - Can't specify target table for update in FROM clause](#)

175. Combine Two Tables

<https://leetcode.com/problems/combine-two-tables/description/>

Description

Person 表:

```
+-----+-----+
| Column Name | Type   |
+-----+-----+
| PersonId    | int    |
| FirstName   | varchar|
| LastName    | varchar|
+-----+-----+
```

PersonId is the primary key column for this table.

Address 表:

```
+-----+-----+
| Column Name | Type   |
+-----+-----+
| AddressId   | int    |
| PersonId    | int    |
| City        | varchar|
| State       | varchar|
+-----+-----+
```

AddressId is the primary key column for this table.

查找 FirstName, LastName, City, State 数据, 而不管一个用户有没有填地址信息。

SQL Schema

```
DROP TABLE
IF
    EXISTS Person;
CREATE TABLE Person ( PersonId INT, FirstName VARCHAR ( 255 ), LastName VARCHAR ( 255 ) );
DROP TABLE
IF
    EXISTS Address;
CREATE TABLE Address ( AddressId INT, PersonId INT, City VARCHAR ( 255 ), State VARCHAR ( 255 ) );
INSERT INTO Person ( PersonId, LastName, FirstName )
VALUES
    ( 1, 'Wang', 'Allen' );
INSERT INTO Address ( AddressId, PersonId, City, State )
VALUES
    ( 1, 2, 'New York City', 'New York' );
```

Solution

使用左外连接。


```
SELECT
    FirstName,
    LastName,
    City,
    State
FROM
    Person P
    LEFT JOIN Address A
    ON P.PersonId = A.PersonId;
```

181. Employees Earning More Than Their Managers

<https://leetcode.com/problems/employees-earning-more-than-their-managers/description/>

Description

Employee 表:

Id	Name	Salary	ManagerId
1	Joe	70000	3
2	Henry	80000	4
3	Sam	60000	NULL
4	Max	90000	NULL

查找薪资大于其经理薪资的员工信息。

SQL Schema

```
DROP TABLE
IF
    EXISTS Employee;
CREATE TABLE Employee ( Id INT, NAME VARCHAR ( 255 ), Salary INT, ManagerId INT );
INSERT INTO Employee ( Id, NAME, Salary, ManagerId )
VALUES
    ( 1, 'Joe', 70000, 3 ),
    ( 2, 'Henry', 80000, 4 ),
    ( 3, 'Sam', 60000, NULL ),
    ( 4, 'Max', 90000, NULL );
```

Solution

```

SELECT
    E1.NAME AS Employee
FROM
    Employee E1
    INNER JOIN Employee E2
    ON E1.ManagerId = E2.Id
    AND E1.Salary > E2.Salary;

```

183. Customers Who Never Order

<https://leetcode.com/problems/customers-who-never-order/description/>

Description

Customers 表:

Id	Name
1	Joe
2	Henry
3	Sam
4	Max

Orders 表:

Id	CustomerId
1	3
2	1

查找没有订单的顾客信息:

Customers
Henry
Max

SQL Schema

```

DROP TABLE IF EXISTS Customers;

```

```
CREATE TABLE Customers ( Id INT, NAME VARCHAR ( 255 ) );
DROP TABLE
IF
    EXISTS Orders;
CREATE TABLE Orders ( Id INT, CustomerId INT );
INSERT INTO Customers ( Id, NAME )
VALUES
    ( 1, 'Joe' ),
    ( 2, 'Henry' ),
    ( 3, 'Sam' ),
    ( 4, 'Max' );
INSERT INTO Orders ( Id, CustomerId )
VALUES
    ( 1, 3 ),
    ( 2, 1 );
```

Solution

左外链接

```
SELECT
    C.Name AS Customers
FROM
    Customers C
    LEFT JOIN Orders O
        ON C.Id = O.CustomerId
WHERE
    O.CustomerId IS NULL;
```

子查询

```
SELECT
    Name AS Customers
FROM
    Customers
WHERE
    Id NOT IN ( SELECT CustomerId FROM Orders );
```

184. Department Highest Salary

<https://leetcode.com/problems/department-highest-salary/description/>

Description

Employee 表:

```

+-----+-----+-----+-----+
| Id | Name | Salary | DepartmentId |
+-----+-----+-----+-----+
| 1 | Joe | 70000 | 1 |
| 2 | Henry | 80000 | 2 |
| 3 | Sam | 60000 | 2 |
| 4 | Max | 90000 | 1 |
+-----+-----+-----+-----+

```

Department 表:

```

+-----+-----+
| Id | Name |
+-----+-----+
| 1 | IT |
| 2 | Sales |
+-----+-----+

```

查找一个 Department 中收入最高者的信息:

```

+-----+-----+-----+
| Department | Employee | Salary |
+-----+-----+-----+
| IT | Max | 90000 |
| Sales | Henry | 80000 |
+-----+-----+-----+

```

SQL Schema

```

DROP TABLE IF EXISTS Employee;
CREATE TABLE Employee ( Id INT, NAME VARCHAR ( 255 ), Salary INT, DepartmentId INT );
DROP TABLE IF EXISTS Department;
CREATE TABLE Department ( Id INT, NAME VARCHAR ( 255 ) );
INSERT INTO Employee ( Id, NAME, Salary, DepartmentId )
VALUES
    ( 1, 'Joe', 70000, 1 ),
    ( 2, 'Henry', 80000, 2 ),
    ( 3, 'Sam', 60000, 2 ),
    ( 4, 'Max', 90000, 1 );
INSERT INTO Department ( Id, NAME )
VALUES
    ( 1, 'IT' ),
    ( 2, 'Sales' );

```

Solution

创建一个临时表, 包含了部门员工的最大薪资。可以对部门进行分组, 然后使用 MAX() 汇总函数取得最大薪资。

之后使用连接找到一个部门中薪资等于临时表中最大薪资的员工。

```

SELECT
    D.NAME Department,
    E.NAME Employee,
    E.Salary
FROM
    Employee E,
    Department D,
    ( SELECT DepartmentId, MAX( Salary ) Salary FROM Employee GROUP BY DepartmentId ) M
WHERE
    E.DepartmentId = D.Id
    AND E.DepartmentId = M.DepartmentId
    AND E.Salary = M.Salary;

```

176. Second Highest Salary

<https://leetcode.com/problems/second-highest-salary/description/>

Description

```

+----+-----+
| Id | Salary |
+----+-----+
| 1  | 100    |
| 2  | 200    |
| 3  | 300    |
+----+-----+

```

查找工资第二高的员工。

```

+-----+
| SecondHighestSalary |
+-----+
| 200                  |
+-----+

```

没有找到返回 null 而不是不返回数据。

SQL Schema

```
DROP TABLE
IF
    EXISTS Employee;
CREATE TABLE Employee ( Id INT, Salary INT );
INSERT INTO Employee ( Id, Salary )
VALUES
    ( 1, 100 ),
    ( 2, 200 ),
    ( 3, 300 );
```

Solution

为了在没有查找到数据时返回 null，需要在查询结果外面再套一层 SELECT。

```
SELECT
    ( SELECT DISTINCT Salary FROM Employee ORDER BY Salary DESC LIMIT 1, 1 ) SecondHighestSalary;
```

177. Nth Highest Salary

Description

查找工资第 N 高的员工。

SQL Schema

同 176。

Solution

```
CREATE FUNCTION getNthHighestSalary ( N INT ) RETURNS INT BEGIN

SET N = N - 1;
RETURN ( SELECT ( SELECT DISTINCT Salary FROM Employee ORDER BY Salary DESC LIMIT N, 1 ) );

END
```

178. Rank Scores

<https://leetcode.com/problems/rank-scores/description/>

Description

得分表：

```
+-----+-----+
| Id | Score |
+-----+-----+
| 1  | 3.50  |
| 2  | 3.65  |
| 3  | 4.00  |
| 4  | 3.85  |
| 5  | 4.00  |
| 6  | 3.65  |
+-----+-----+
```

将得分排序，并统计排名。

```
+-----+-----+
| Score | Rank |
+-----+-----+
| 4.00  | 1    |
| 4.00  | 1    |
| 3.85  | 2    |
| 3.65  | 3    |
| 3.65  | 3    |
| 3.50  | 4    |
+-----+-----+
```

SQL Schema

```
DROP TABLE
IF
    EXISTS Scores;
CREATE TABLE Scores ( Id INT, Score DECIMAL ( 3, 2 ) );
INSERT INTO Scores ( Id, Score )
VALUES
    ( 1, 3.5 ),
    ( 2, 3.65 ),
    ( 3, 4.0 ),
    ( 4, 3.85 ),
    ( 5, 4.0 ),
    ( 6, 3.65 );
```

Solution

```
SELECT
    S1.score,
    COUNT( DISTINCT S2.score ) Rank
FROM
    Scores S1
    INNER JOIN Scores S2
    ON S1.score <= S2.score
GROUP BY
    S1.id
ORDER BY
    S1.score DESC;
```

180. Consecutive Numbers

<https://leetcode.com/problems/consecutive-numbers/description/>

Description

数字表:

Id	Num
1	1
2	1
3	1
4	2
5	1
6	2
7	2

查找连续出现三次的数字。

ConsecutiveNums
1

SQL Schema

```
DROP TABLE
IF
    EXISTS LOGS;
CREATE TABLE LOGS ( Id INT, Num INT );
INSERT INTO LOGS ( Id, Num )
VALUES
    ( 1, 1 ),
    ( 2, 1 ),
    ( 3, 1 ),
    ( 4, 2 ),
    ( 5, 1 ),
    ( 6, 2 ),
    ( 7, 2 );
```

Solution

```
SELECT
    DISTINCT L1.num ConsecutiveNums
FROM
    Logs L1,
    Logs L2,
    Logs L3
WHERE L1.id = L2.id - 1
    AND L2.id = L3.id - 1
    AND L1.num = L2.num
    AND L2.num = L3.num;
```

626. Exchange Seats

<https://leetcode.com/problems/exchange-seats/description/>

Description

seat 表存储着座位对应的学生。

```
+-----+-----+
|  id  | student |
+-----+-----+
|  1   | Abbot   |
|  2   | Doris   |
|  3   | Emerson |
|  4   | Green   |
|  5   | Jeames  |
+-----+-----+
```

要求交换相邻座位的两个学生，如果最后一个座位是奇数，那么不交换这个座位上的学生。

id	student
1	Doris
2	Abbot
3	Green
4	Emerson
5	Jeames

SQL Schema

```

DROP TABLE
IF
    EXISTS seat;
CREATE TABLE seat ( id INT, student VARCHAR ( 255 ) );
INSERT INTO seat ( id, student )
VALUES
    ( '1', 'Abbot' ),
    ( '2', 'Doris' ),
    ( '3', 'Emerson' ),
    ( '4', 'Green' ),
    ( '5', 'Jeames' );

```

Solution

使用多个 union。

```

SELECT
    s1.id - 1 AS id,
    s1.student
FROM
    seat s1
WHERE
    s1.id MOD 2 = 0 UNION
SELECT
    s2.id + 1 AS id,
    s2.student
FROM
    seat s2
WHERE
    s2.id MOD 2 = 1
    AND s2.id != ( SELECT max( s3.id ) FROM seat s3 ) UNION
SELECT
    s4.id AS id,
    s4.student
FROM
    seat s4

```

```
WHERE
    s4.id MOD 2 = 1
    AND s4.id = ( SELECT max( s5.id ) FROM seat s5 )
ORDER BY
    id;
```

github: <https://github.com/sjsdfg/CS-Notes-PDF>