Sample SQL Questions

top5AverageGrade

You're doing research about academic achievement, and you're studying one particular group of students at a local university. Given a table of the students' grades, your task is to find the average grade of the five most successful students in this group.

The information about the students' grades is stored in a table called **students**, which has the following attributes:

- `student_id`: the unique identifier of the student;
- `student_name`: the name of the student;
- `grade`: the grade that the student achieved.

Your task is to write a select statement which outputs one column `average_grade` and one row that contains the average grade of the five students with the highest grades. The answer should be formatted to `2` digits after the decimal point. It is guaranteed that the five most successful students can be uniquely identified.

Example

For the following table **students**

student_id	student_name	grade
1	Oliver Smith	3.2
2	Jacob Bell	2.9
3	William Thompson	3.1
4	Sophie Clark	3.5
5	Daniel Palmer	3.6
6	Emily Morris	4.0

7	Zachary Mills	2.5

the output should be

average_grade
3.48

The top 5 grades for this group are `4.0`, `3.6`, `3.5`, `3.2`, and `3.1`, which sums to `17.4`, so the average is `17.4 / 5 = 3.48`.

netIncome

You own a small company, and you keep track of its income in the **accounting** table, which has the following structure:

- `date`: a unique date on which your company was open;
- `profit`: the amount of money your company earned that day;
- `loss`: the amount of money your company lost that day.

You've decided to sell the company, and in order to make the offer more appealing to potential buyers you need to create a financial report.

Given the **accounting** table, write a select statement which returns three columns: `year`, `quarter` and `net_profit`. The first column should contain the year, the second one should contain the quarter of that year, and the third one should contain the net income (`profit - loss` difference) of your company during that period. The output should be sorted by the `year` in *ascending* order. If there are several rows with the same `year`, sort them by the `quarter` in *ascending* order.

Don't include year/quarter in the answer if there is no entry for it in the **accounting** table.

Example

For the following table **accounting**

date	profit	loss
2006-01-01	100	15

2006-07-15	40	100
2006-08-01	50	50
2006-11-11	100	50
2006-12-01	50	80
2007-05-03	42	16

the output should be

year	quarter	net_profit
2006	1	85
2006	3	-60
2006	4	20
2007	2	26

unluckyEmployees

Your company has fallen on hard times, and you have to let some of your employees go. You figure it will be easier to fire an entire department all at once, so now you want to determine which department it's going to be.

Information about your employees and departments is stored in two tables, **employees** and **departments**, respectively. Here are their structures:

- **departments**:
  - `id`: unique department id
  - `name`: department name
- **employees**:
  - `id`: unique employee id
  - `full_name`: employee's full name

- department: foreign key referencing departments.id
- salary: employee's salary

To choose the unfortunate department, you set a number of criteria: you are willing to get rid of any department that has no more than 5 employees. Among these smaller departments, you will consider those where the total salary of all its employees is maximal. Lastly, to make a tough situation more fair, you decide to make the final choice from the remaining departments at random. Thus, you'd like to write a select statement that lists departments:

- select all departments with less than 6 employees;
- sort these departments by the total salary of its workers in descending order (in the case of a tie, the department with the greatest number of employees should go first; if it's still not enough to break a tie, the department with the smallest id should go first);
- cross out the departments at the even rows and leave only those in the odd positions, to consider them more thoroughly afterwards.

Given tables **employees** and **departments**, your task is to write a select statement described above. The output should have columns dep_name (the name of the department), emp_number (the number of employees in this department), and total_salary (the sum of all employees' salaries in this department) and be sorted according to the specifications above.

Example

For the following tables **departments**

id	name
1	IT
2	HR
3	Sales

and **employees**

id	full_name	salary	department
1	James Smith	20	1
2	John Johnson	13	1

3	Robert Jones	15	1
4	Michael Williams	15	1
5	Mary Troppins	17	1
8	Penny Old	14	2
9	Richard Young	17	2
10	Drew Rich	50	3

the output should be

dep_name	emp_number	total_salary
IT	5	80
HR	2	31

All three departments have `5` or fewer employees, so they are all candidates to be fired. When sorted in descending order by `total_salary`, the `Sales` department becomes the second (i.e. is located at an even row), so it's not present in the resulting table.