



SQL

Class 3

Agenda

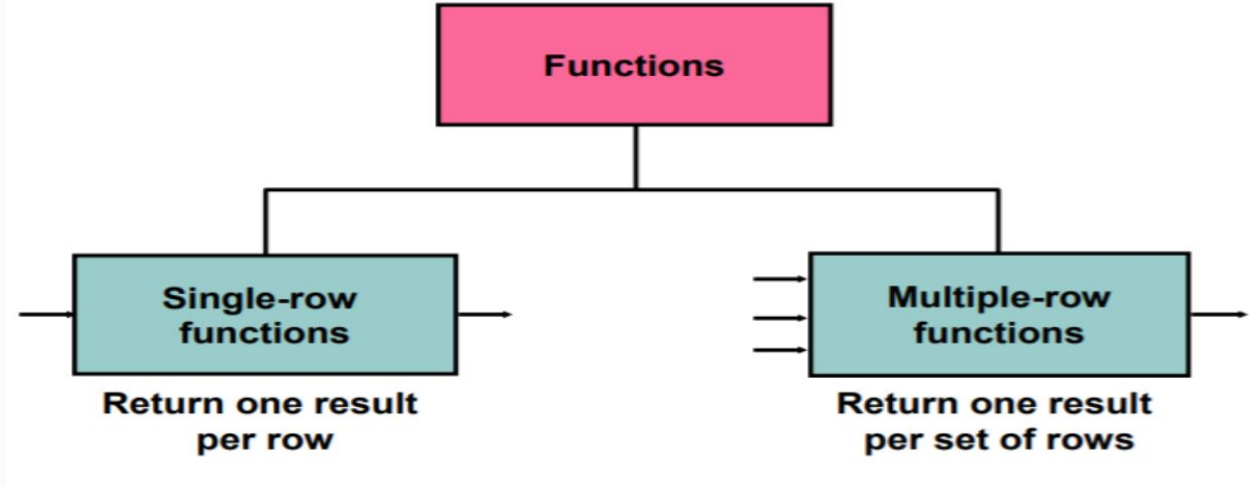
Function in SQL

Set Operators

SubQueries

Functions in SQL

- Is a set of statements that performs the task
- Accepts values through parameters
- Returns the processed value



Single Row Functions

- Act on each row and return one result per row
- Can be used in Select and Where Clauses
- Accepts arguments that can be a column or an expression

Types of Single Row Functions:

- Character functions
- Conversion functions
- Date functions
- Number functions
- General functions

These functions operate on single rows only and return one result per ROW

Single Row Functions

Case Manipulation Functions

LOWER, UPPER, and INITCAP

Syntax

```
Select Lower/Upper/Initcap (column name)  
      From Table Name;
```

OR

```
Select column name  
      From Table Name  
Where Lower /Upper/Initcap (column name) =  
      condition;
```

Single Row Functions

Case Manipulation Functions

Display employee number, name and department number for employee Higgins

```
SELECT employee_id, last_name, department_id
FROM   employees
WHERE  last_name = 'higgins';
no rows selected
```

```
SELECT employee_id, last_name, department_id
FROM   employees
WHERE  LOWER(last_name) = 'higgins';
```

Multiple row (Aggregate Functions)

Performs calculation on a set of values and return a single value

Syntax

```
Select max/count/min/avg/sum(column name)  
                From Table Name;
```

Max(), Count(), Sum(), Min(), Avg()

Multiple row (Aggregate Functions)

Performs calculation on a set of values and
return a single value

```
Select job_id, Count(*) From Employees  
Group By job_id;
```



Multiple
ROW
Function

	JOB_ID	COUNT(*)
1	AC_ACCOUNT	1
2	AC_MGR	1
3	AD_ASST	1
4	AD PRES	1
5	AD_VP	2
6	FI_ACCOUNT	5
7	FI_MGR	1
8	HR_REP	1
9	IT_PROG	5
10	MK_MAN	1
11	MK_REP	1
12	PR_REP	1
13	PU_CLERK	5
14	PU_MAN	1
15	SA_MAN	5
16	SA_REP	30

Group By Clause

Used with Aggregate Functions to collect data across multiple records and group the results by one or more columns.

Syntax:

SELECT column1, function_name(column2)

From Table Name

Where condition

Group By column name1

Task

- Display last name in uppercase, first name in lowercase and email in init capital.
- Verify how many employees don't get the commission?
- Display maximum salary for each job ids?
- Display the department id, number of people in each department, average salary, and max salary.
- How can we find how many IT Programmers work in the company?
- How many employees first name starts with A?
- Can you find the average salary in each department? Please sort results by the salary.
- Display how many Sales Representative, Accountant and Stock managers are hired by the company?
- 10:52 TIME

Having Clause

Multiple Row Function → Having Clause

Syntax

```
Select max/count/min/avg/sum(column name),  
       column name  
From Table Name  
Group by column name  
Having group condition;
```

Where vs Having

Where Clause

- Used to filter Rows
- Applied before Group BY
- Used if condition doesn't contain Group Function
- 11:37

Having Clause

- Used to filter Groups
- Applied after Group BY
- Used if condition contains Group Function

This is one of the most popular interview questions

Task

- How can you find out AVG salary for employees per departments where average salary is more than 6500
- How can see number of employees that work in department who's total number is more than 5 people.
- How can I see max salary for all job ids where max salary will be more that 4000. Please display the max highest salaries per job id on top.
- How can I find out the average salary of people working for department 80 through 120, but I want to see only those departments where average salary is between 8000 to 10000?

SET Operators

4 Set Operators: UNION ALL, UNION, INTERSECT and MINUS.

Used to join the results of two (or more) SELECT statements.

RULES:

Same number of columns must be selected by all participating SELECT statements.

Data types of the column must be the same/
match

SET Operators

UNION ALL

UNION

MINUS

INTERSECT

Syntax

```
Select Column Name From Table Name  
Union All/Union/Minus/Intersect  
Select Column Name From Table Name;
```

IQ: What is the difference between Union and UNION ALL

SET Operators

Union All

- Combines the result of 2 queries
- Does not remove duplicates and does not sort

MINUS

- Compares the result of first query against the second query
- Displays rows that are present in the first set only by removing repeated values
- Removes duplicates

UNION

- Combines the result of 2 queries
- Removes duplicates and sorts the result

INTERSECT

- Return only the records that are present in Both tables
- Removes duplicates

Task

- How can I see combined information such as first name, last name and phone number from both employees?
- Compare the department id from employees and from departments table and return the common department id.
- Display department id and manager id from both employees and departments table. Please remove duplicates and sort them ascending.
- Let's say someone wants to know employees that are still working for the company.

SubQueries

Outer Query → Inner Query

Result of inner query will be input for the outer query

Syntax

```
Select column name  
From Table Name  
Where column name Comparison Operator  
(Select column name From Table Name);
```

Task

- List all employees who were hired after with first name Ellen?
- How to retrieve information of the employee who earns the lowest salary?
- Display all country names that belongs to Europe?
- Get the count of employee who earns more than average salary?
- Can you display information of employees who works in Seattle?
- How can you display the third highest salary?