

The background is a light gray gradient. It is decorated with several realistic water droplets of various sizes, some with highlights and shadows, scattered across the top and bottom edges. In the upper center, there is a faint, circular, embossed-style logo that appears to be a university crest or seal.

# GROUP FUNCTIONS

# GROUP FUNCTIONS

- The data that you need is not always directly stored in the tables. Sometimes you need to perform calculations on the stored data in order to present it to the end user.
- For example, you cannot get the total amount of each order by simply querying from the orderdetails table because the orderdetails table stores only quantity and price of each item. You have to select the quantity and price for each item on an order and calculate the total order value.
- We use aggregate functions for this task. By definition an aggregate function performs a calculation on a set of values and returns a single value.

# GROUP FUNCTIONS

- There are several aggregate functions available in MySQL:
  - MIN
  - MAX
  - SUM
  - AVG
  - COUNT
- An aggregate function can be applied to a whole table or a group of rows on a table.
- An aggregate function will ignore null values.

# GROUP FUNCTIONS

- Min: used on any data type to return the minimum value
- Max: used on any data type to return the maximum value

SAL
5000
2850
2450
2975
3000
3000
800

```
SELECT MIN(sal)  
FROM emp;
```

MIN(SAL)
800

# GROUP FUNCTIONS

- Sum: used on numeric data to find the total or sum of values
- Avg: used on numeric data to find the average

SAL
5000
2850
2450
2975
3000
3000
800

```
SELECT SUM(sal)  
FROM emp;
```

SUM(SAL)
29025

# GROUP FUNCTIONS

- Count: returns the number of rows for customers that had order issues resolved.

```
SELECT COUNT(c.customerNumber)
```

```
FROM customers c
```

```
INNER JOIN orders o ON c.customerNumber = o.customerNumber
```

```
WHERE o.status = 'Resolved';
```

# GROUP FUNCTIONS

- Group functions are written in the select clause
- They cannot be written in the where clause

```
SELECT lastName,  
       firstName  
from employees  
where employeeNumber= min(employeeNumber);
```

✖ 7 11:23:35 SELECT lastName, firstName from employees... Error Code: 1111. Invalid use of group function 0.000 sec

# GROUP FUNCTIONS

- Min used with any data type

Examples	Result
SELECT MIN(lifeExpectancy) AS "Lowest life expentancy" FROM countries;	37.2
SELECT MIN(Name) FROM country;	Afghanistan
SELECT MIN(orderDate) FROM orders;	2003-01-06



# GROUP FUNCTIONS

- Max used on any data type

Examples	Result
SELECT MAX(lifeExpectancy) AS "Lowest life expentancy" FROM countries;	83.5
SELECT MAX(Name) FROM country;	Zimbabwe
SELECT MAX(orderDate) FROM orders;	2005-05-31

# GROUP FUNCTIONS

- Sum used on numeric data

Examples	Result
SELECT SUM(SurfaceArea) FROM country WHERE region = 'Caribbean';	234423
SELECT SUM(creditLimit) FROM customers WHERE state = 'NSW';	201 100

# GROUP FUNCTIONS

- AVG used on numeric data

Examples	Result
SELECT AVG(SurfaceArea) FROM country WHERE continent = 'Europe';	501068.128261
SELECT AVG(creditLimit) FROM customers WHERE state = 'NSW';	100550

# GROUP FUNCTIONS

- You can have more than one group function in the select clause, on the same or different columns

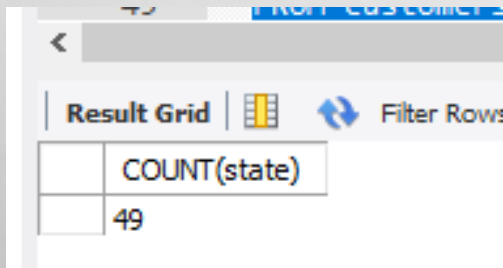
```
SELECT AVG(SurfaceArea),  
       MIN(surfaceArea),  
       SUM(surfaceArea)  
FROM country  
WHERE continent = 'Europe';
```

	AVG(SurfaceArea)	MIN(surfaceArea)	SUM(surfaceArea)
	501068.128261	0.40	23049133.90

# GROUP FUNCTIONS

- Count returns the number of non-null values in the column

```
SELECT COUNT(state) FROM customers;
```



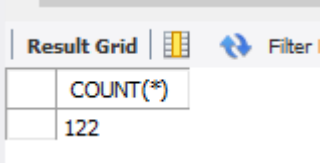
The screenshot shows a database interface with a 'Result Grid' tab selected. The grid contains a single row with the column header 'COUNT(state)' and the value '49'. A 'Filter Rows' button is visible to the right of the grid.

COUNT(state)
49

# GROUP FUNCTIONS

- Count(\*) returns a count of all rows in a table

```
SELECT count (*)  
  
FROM customers;
```



A screenshot of a database application window titled 'Result Grid'. It contains a single row with two columns. The first column is empty, and the second column contains the text 'COUNT(\*)'. Below this row, the value '122' is displayed, representing the count of all rows in the 'customers' table.

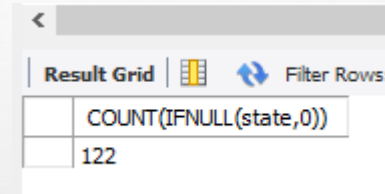
	COUNT(*)
	122

- We use count when we want to count all rows even those that have nulls

# GROUP FUNCTIONS

- Sometimes you want to include null values in group functions

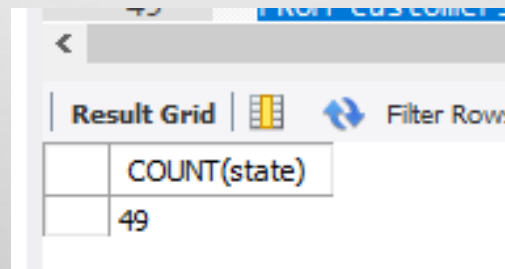
```
SELECT COUNT (IFNULL (state, 0) )  
FROM customers;
```



A screenshot of a database query result grid. The grid has two columns: the first column is empty, and the second column contains the text 'COUNT(IFNULL(state,0))'. Below this, there is a single row with the value '122'.

	COUNT(IFNULL(state,0))
	122

```
SELECT COUNT (state)  
FROM customers;
```



A screenshot of a database query result grid. The grid has two columns: the first column is empty, and the second column contains the text 'COUNT(state)'. Below this, there is a single row with the value '49'.

	COUNT(state)
	49