

# Lab 3

Aggregate Functions and Set Operations

# What are the aggregate functions?

- Functions that calculate multi-value and return a result in a single value. [1]
- Sometimes it called group functions.
- The aggregate functions also work with GROUP BY command.

value

1

2

4

5

SELECT AVG(value)

3



# GROUP BY

- As its name. This command groups any rows with the same value together.
- The GROUP BY command comes after the WHERE clause.
- To filter grouped or aggregated rows, use the HAVING clause.
- For example, this following query will retrieve an average score of each group:

student_id	group	score
1	a	5
2	a	4
3	b	4
4	b	4
5	c	3
6	c	4

```
SELECT group, AVG(score) AS avg_score
FROM student
[WHERE group IS NOT NULL]
GROUP BY group
HAVING avg_score >= 4
```



group	avg_score
<b>a</b>	<b>4.5</b>
<b>b</b>	<b>4</b>
c	3.5

# Set Operators

- **INTERSECT**

Show customers which are employees:

```
SELECT customer_name AS name FROM customers  
INTERSECT  
SELECT employee_name AS name FROM employees;
```

- **EXCEPT** (MINUS in Oracle)

Show customers which aren't employees:

```
SELECT customer_name AS name FROM customers  
EXCEPT  
SELECT employee_name AS name FROM employees;
```

# Set Operators

- **UNION**

Show customers' id which purchased in 2007, 2009 (in an unpleasant way):

```
SELECT customer_name  
FROM purchases WHERE  
YEAR(purchasedDate) = 2007  
UNION  
SELECT customer_name  
FROM purchases WHERE  
YEAR(purchasedDate) = 2009
```

# Ordering

- Order a resultset.
- The default is ordering in ascending order.
- DESC can be specified to order in descending order;

```
SELECT *  
FROM employees  
ORDER BY id
```

```
SELECT *  
FROM employees  
ORDER BY id ASC
```

```
SELECT *  
FROM employees  
ORDER BY id DESC
```

# Built-in Functions

- Numeric Function <https://mariadb.com/kb/en/library/numeric-functions/>
- <https://mariadb.com/kb/en/library/built-in-functions/>

# Alias

- The alias can have only 256 characters [1].

```
SELECT NOW() AS `CURRENT_TIME`
```

```
SELECT employee_id AS `id`  
FROM employees  
ORDER BY id
```

[1] <https://mariadb.com/kb/en/library/identifier-names/>



# References

- <https://mariadb.com/kb/en/library/aggregate-functions/>
- <https://mariadb.com/kb/en/library/group-by/>
- <https://mariadb.com/kb/en/library/intersect/>
- <https://mariadb.com/kb/en/library/except/>
- <https://mariadb.com/kb/en/library/union/>