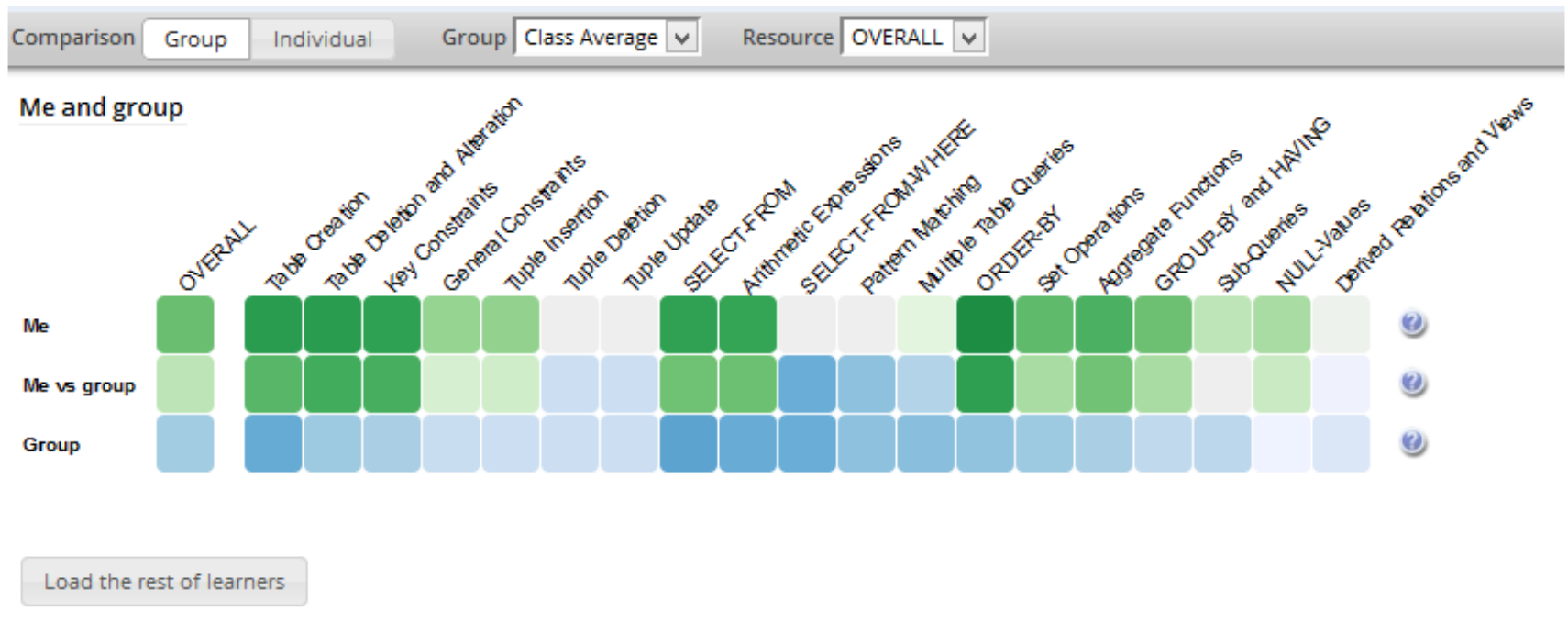


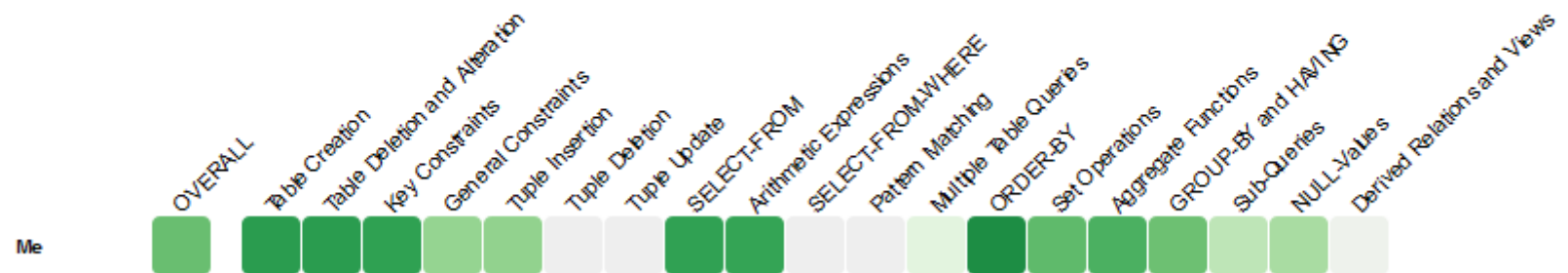
Mastery Grids

User Manual

PAWS Lab
School of Computing and Information
University of Pittsburgh

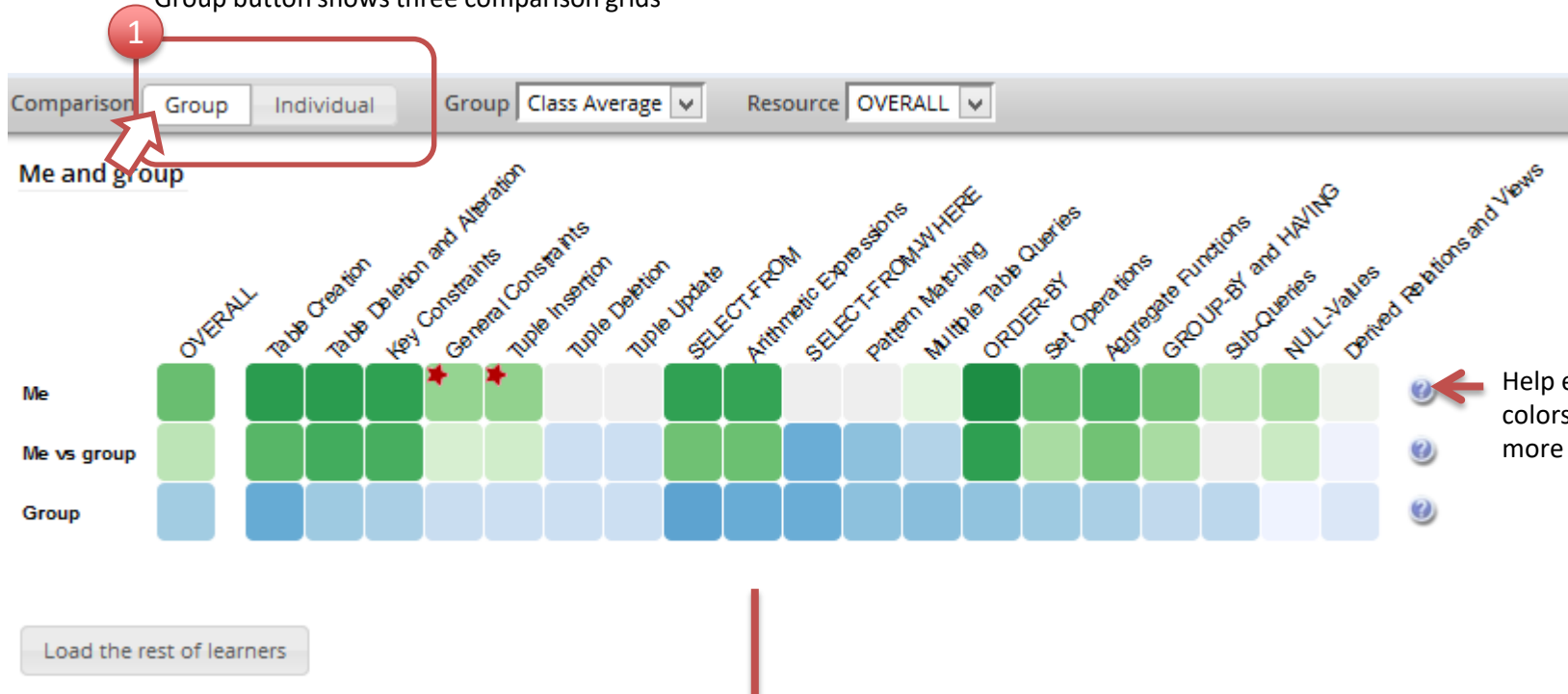


My Progress



This tool is a visualization of your progress in different topics. Darker means more progress

Group button shows three comparison grids



- First row (Me) shows **your progress** (Darker green means more progress on that topic)
- Third row (Group) shows the **average of your classmates progress** (Darker blue means more progress on that topic)
- Second row (Me vs group) **compares your progress with your classmates** (Darker green means you have more progress than the group; darker blue means they have more progress than you; grey means equal progress)
- ★ Stars on topics means that system recommends to you to maximize your knowledge in SQL concepts by exploring those topics first. System tells you that, you have sufficient knowledge to understand 'starred' topics.

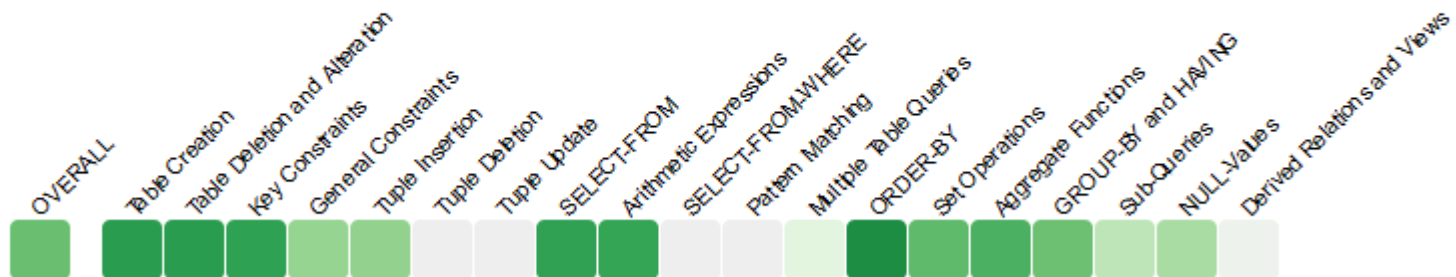
Individual button shows one row

2

Comparison Group Individual Group Class Average Resource OVERALL

My Progress


Me




Select the group to compare
with: all class or top N students
































































3

Comparison: **Group** Individual

Group: **Class Average** 
Class Average
Top 2

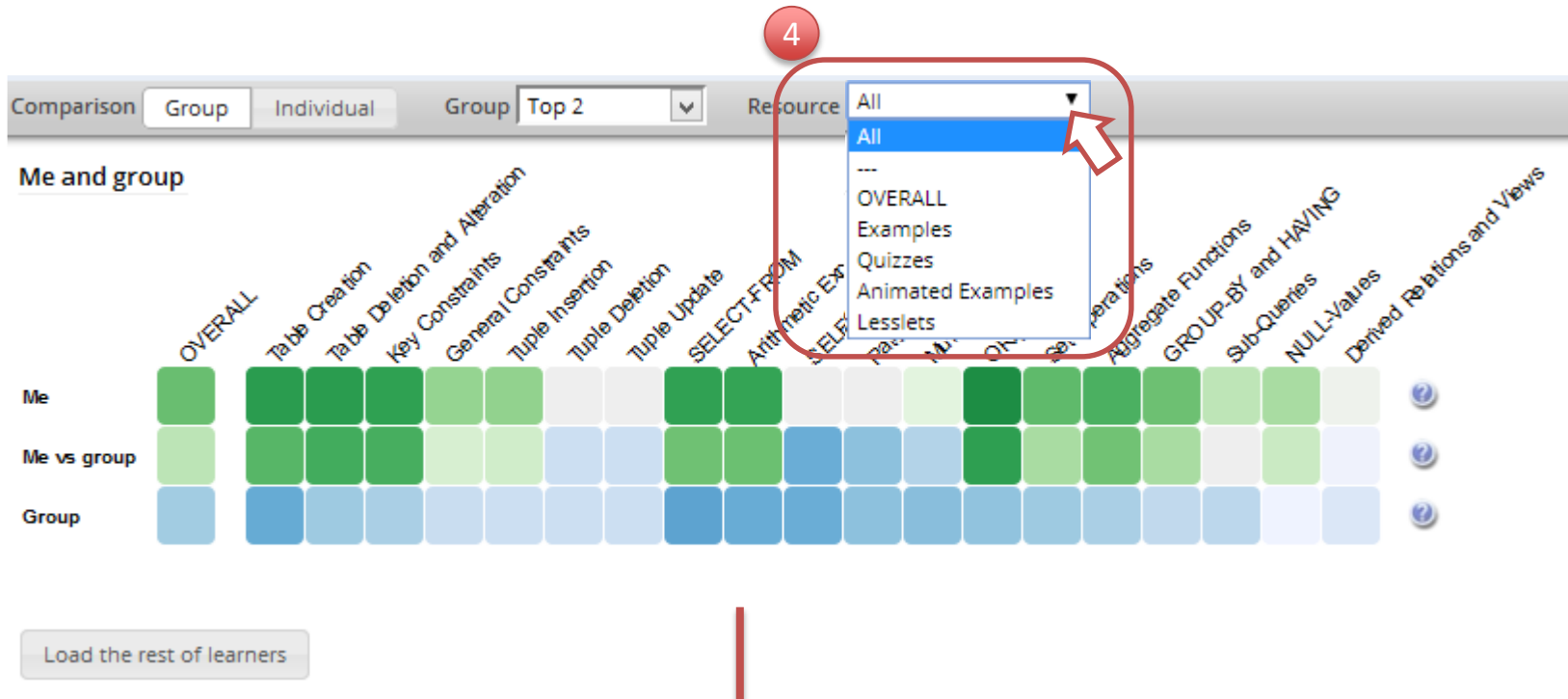
Resource: **OVERALL** 

Me and group

	OVERALL	Table Creation	Table Deletion and Alteration	Key Constraints	General Constraints	Tuple Insertion	Tuple Deletion	Tuple Update	SELECT FROM	Arithmetic Expressions	SELECT FROM WHERE	Pattern Matching	Multiple Table Queries	ORDER BY	Set Operations	Aggregate Functions	GROUP BY and HAVING	Sub-Queries	NULL-Values	Derived Relations and Views	
Me																					
Me vs group																					
Group																					

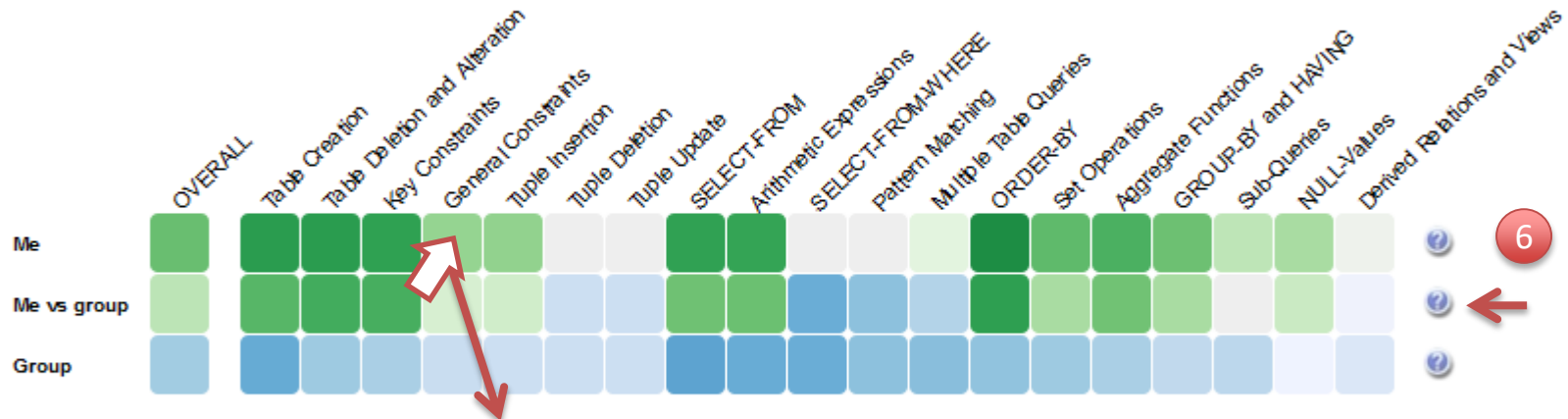
Load the rest of learners

Select which type of resource progress is displayed in the grids
(All, Overall, Examples, Quizzes, Animated Examples, Lesslets)



- **OVERALL** shows progress according to examples and quizzes
- **Examples** shows progress only on examples
- **Quizzes** shows progress only on quizzes (interactive questions)
- **Animated Examples** shows progress only on animated examples
- **Lesslets** shows progress only on lesslets
- **All** displays progress averaging across all content types

Me and group

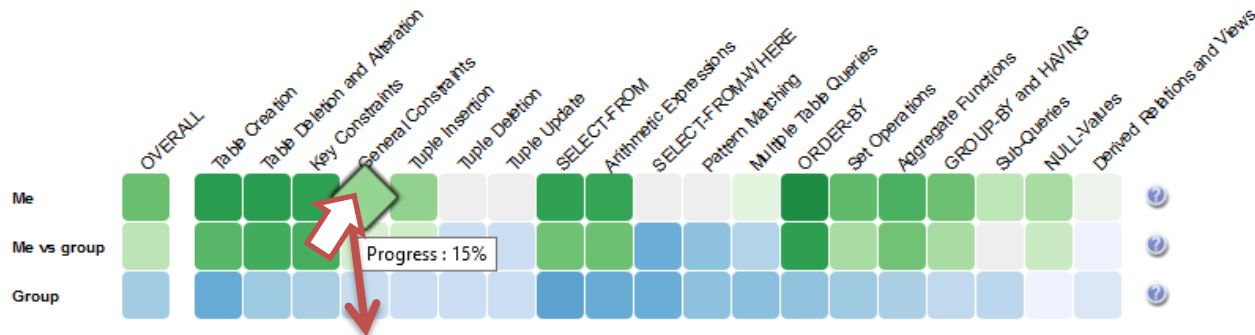


Help explains the colors (darker means more progress)

5 Roll the mouse cursor over the a topic cell on **Me** row

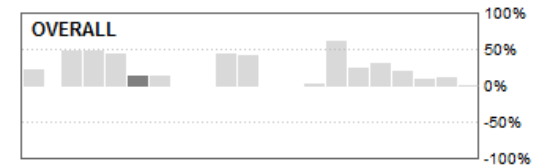
Load the rest of learners

Me and group



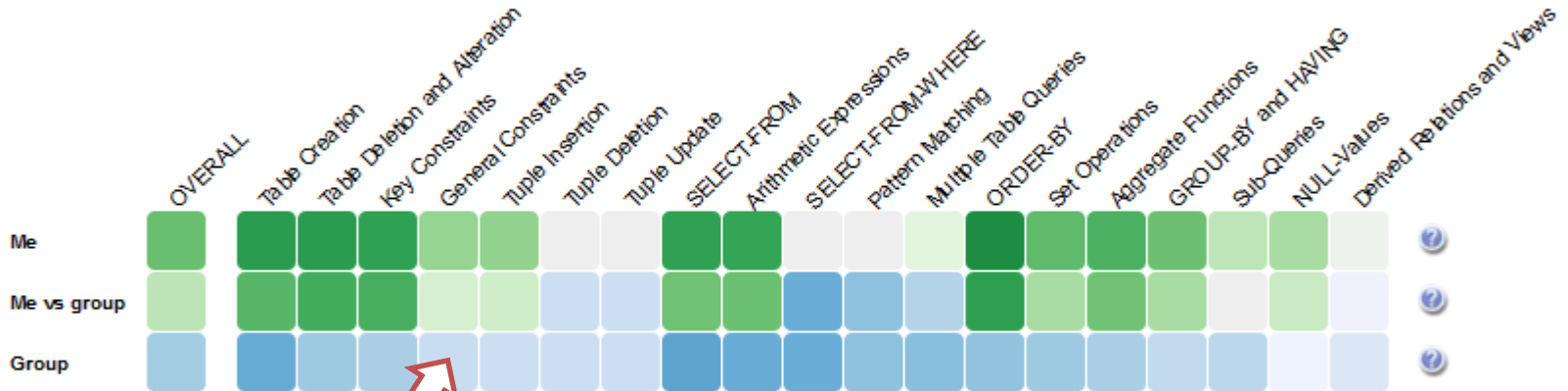
5.1 You can see your progress percentage on the topic

Load the rest of learners



5.2 You can also see your progress percentage on all topics

Me and group

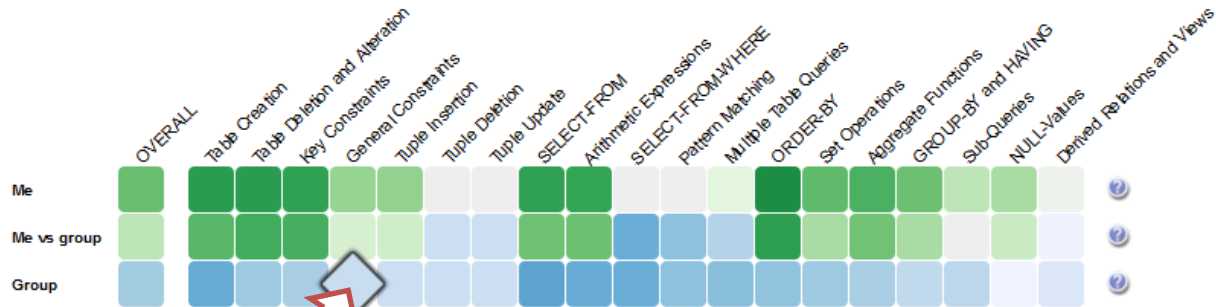


7

Roll the mouse cursor over the a topic cell on **Group** row

Load the rest of learners

Me and group



Group Progress : 9%

7.1

You can see your classmates progress percentage on the topic

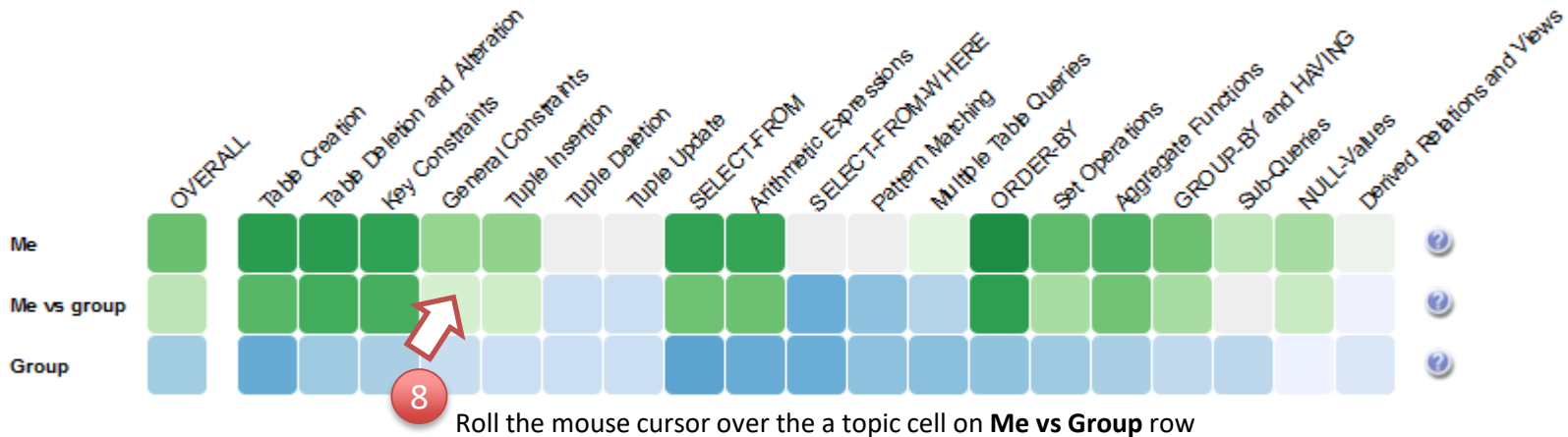
Load the rest of learners



7.2

You can also see your classmates progress percentage on all topics

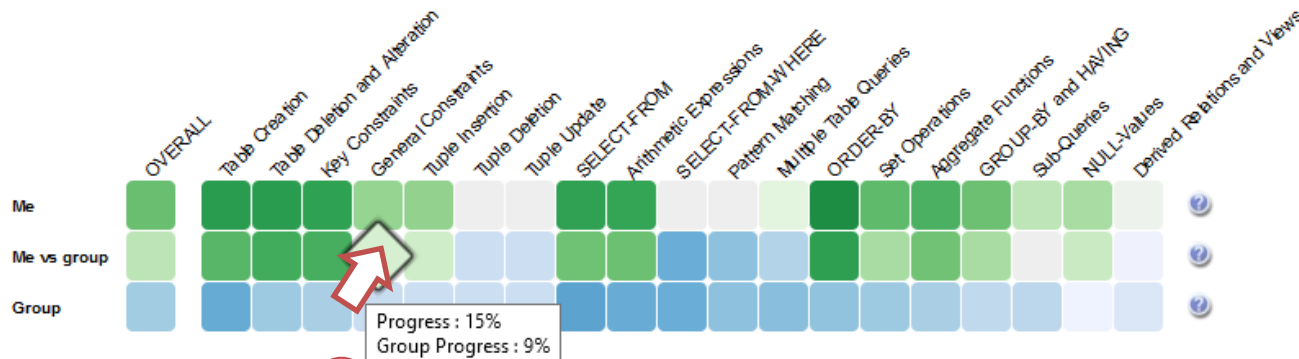
Me and group



Load the rest of learners



Me and group

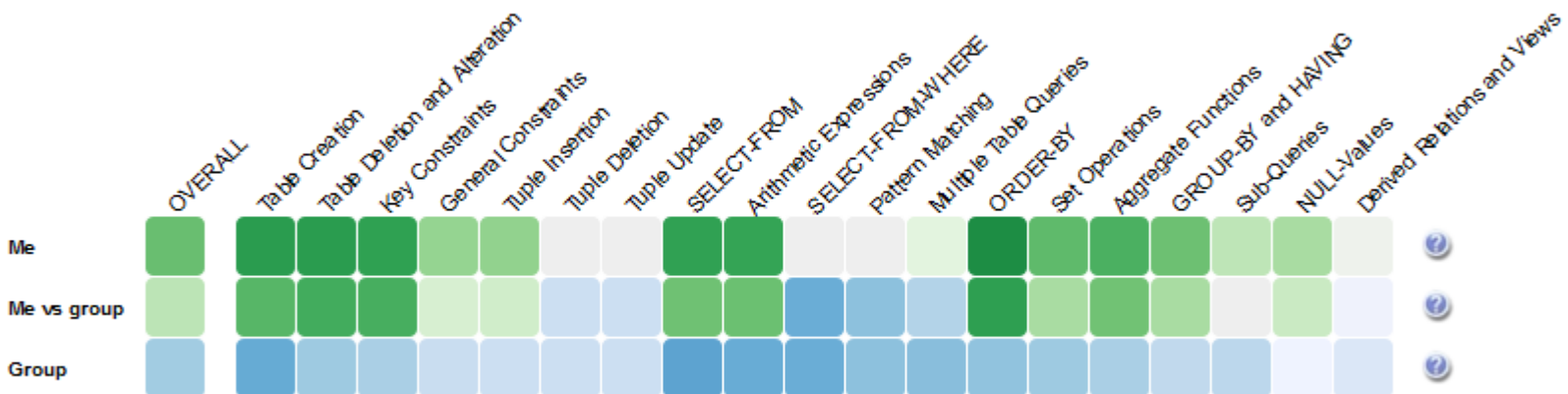


Load the rest of learners



- 8.2 You can also see both your and your classmates progress percentage on the all topics
- *Positive bars show your progress*
 - *Negative bars show your classmates progress*

Me and group

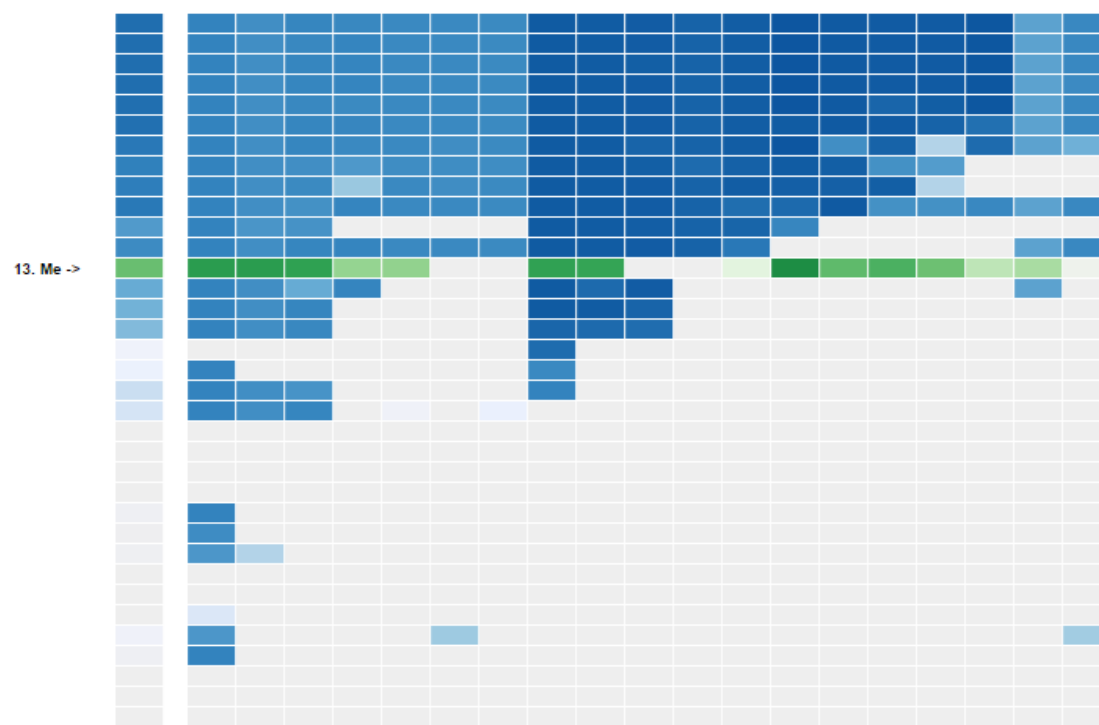


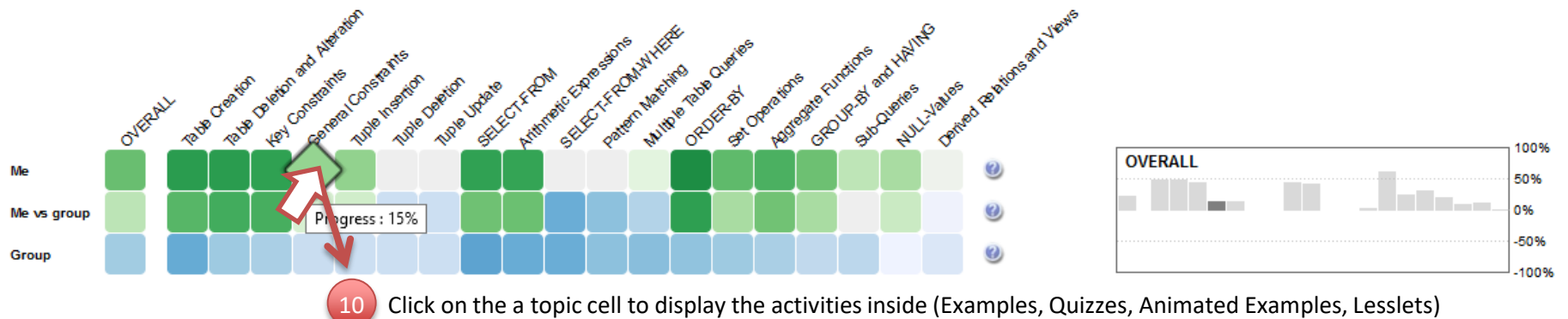
Load the rest of learners

9

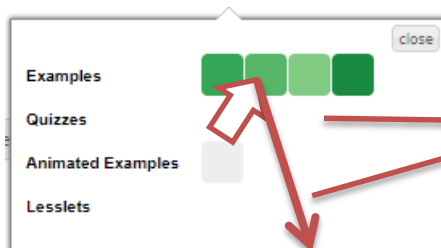
Click button to load the list of other students (does not show usernames) and shows in which position you are in terms of progress

Students in the class (you are 13rd out of 61)





Load the rest of learners



Some topics do not include any quizzes and lesslets

10.1 Click on the cells to see examples. Examples shows a piece of SQL code

Topic: Key Constraints • Activity: Primary Key (1)

```

CREATE TABLE Enrolled
(
  sid CHAR(20),
  cid CHAR(20),
  grade CHAR(2),
  PRIMARY KEY (sid, cid));
  
```

10.2 Click code rows to see explanations.

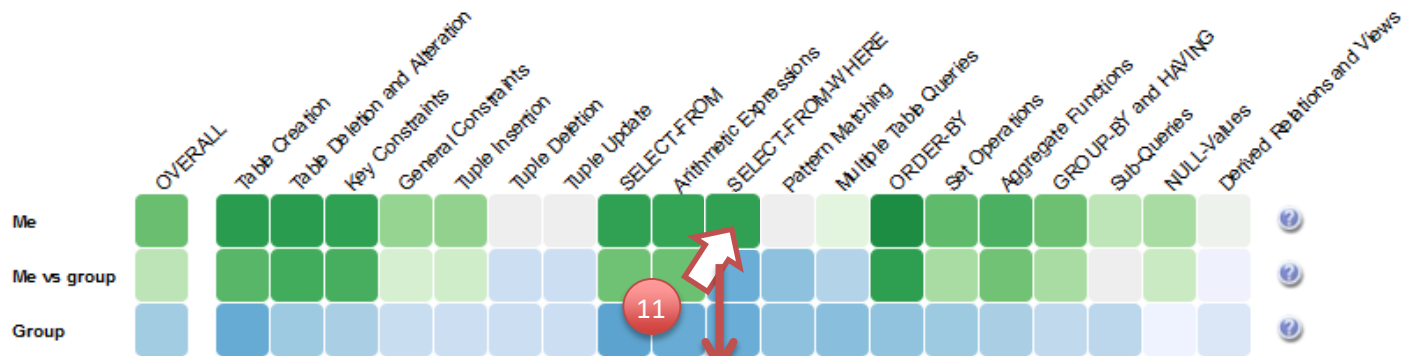
Topic: Key Constraints • Activity: Primary Key (1)

```

CREATE TABLE Enrolled
(
  sid CHAR(20),
  cid CHAR(20),
  grade CHAR(2),
  PRIMARY KEY (sid, cid));
  
```

'grade' is grade of each student and 2 digits character type

Me and group



Click on the a topic cell to display the activities inside

Load the rest of learners

Examples

Quizzes

Animated Examples

Lesslets

close

11.1 If the topic include quizzes, click one of the cells

11.2

A question will be seen. This question includes a task.

To make the task you need the write a SQL statement

Use the data in the tables defined here to write the SQL statement for the task

Topic: SELECT-FROM • Activity: SELECT-FROM question1

Question:

Based on the tables below, write the required SQL expression.

Task:

Show all the information contained in table "customer".

Select id from customer

Submit Answer

Go to SQL-Lab

Table Name	Schema & Sample Data (click +/- to show/hide sample data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update

Question:

Based on the tables below, write the required SQL expression.

Task:

Show all the information contained in table "customer".

11.3

Write a SQL statement and click the "Submit Answer" button

Table Name	Schema & Sample Data (click +/- to show/hide sample data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update

Question:

Based on the tables below, write the required SQL expression.

Task:

Show all the information contained in table "customer".

Sorry, please revise your answer and try again.

11.4

If the answer is wrong, this feedback is shown

Table Name	Schema & Sample Data (click +/- to show/hide sample data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update

Question:

Based on the tables below, write the required SQL expression.

Task:

Show all the information contained in table "customer".

Select id from customer

Submit Answer

Go to SQL-Lab

11.5

Write a SQL statement and click the "Submit Answer" button

Table Name	Schema & Sample Data (click +/- to show/hide sample data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update

Question:

Based on the tables below, write the required SQL expression.

Task:

Show all the information contained in table "customer".

Select * from customer

Well done! The answer is correct.

11.6

If the answer is true, this feedback is shown

Try a similar question

Go to SQL-Lab

Table Name	Schema & Sample Data (click +/- to show/hide sample data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update

How difficult has this activity been for you?

Easy

Medium

Hard

11.7

Submit difficulty level for the question

Question:

Based on the tables below, write the required SQL expression.

Task:

Show all the information contained in table "customer".

*If you want to try SQL statements before submit the question
You can use "Go To SQL-Lab" button*

12

Click the "Go To SQL-Lab" button

Table Name	Schema & Sample Data (click +/- to show/hide sample data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update

SQLLab for question similar to

Task:

Show all the information contained in table "customer".

12.1

A new window will be open

Here is a field that you can work with a sample DB to find out the solution to the question, you can :

12.2

Write a SQL statement and click the «Run the Query" button

Table Name	Schema & Data (click +/- to show/hide data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update
car(+)	license model year
category(+)	category_id name last_update
city(+)	city_id city country_id last_update
customer(+)	customer_id store_id first_name last_name email address_id active create_date last_update

12.3

The Results of the SQL query is shown

The result for query: `Select * from customer`
is:

customer_id	store_id	first_name	last_name	email	address_id	active	create_date	last_update
1	1	MARY	SMITH	MARY.SMITH@sakilacustomer.org	5	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0
2	1	PATRICIA	JOHNSON	PATRICIA.JOHNSON@sakilacustomer.org	6	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0
3	1	LINDA	WILLIAMS	LINDA.WILLIAMS@sakilacustomer.org	7	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0
4	2	BARBARA	JONES	BARBARA.JONES@sakilacustomer.org	8	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0
5	1	ELIZABETH	BROWN	ELIZABETH.BROWN@sakilacustomer.org	9	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0
6	2	JENNIFER	DAVIS	JENNIFER.DAVIS@sakilacustomer.org	10	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0
7	1	MARIA	MILLER	MARIA.MILLER@sakilacustomer.org	11	1	2006-02-14 22:04:36.0	2006-02-15 04:57:20.0

SQLLab for question similar to

Task:
Show all the information contained in table "customer".

Here is a field that you can work with a sample DB to find out the solution to the question, you can :

```
Select * from customer;
```

Run the Query
Close the Lab



To close the screen and to retun question click the «Close the Lab" button

Table Name	Schema & Data (click +/- to show/hide data)
accident(+)	report_number date location
actor(+)	actor_id first_name last_name last_update
address(+)	address_id address district city_id postal_code phone last_update
car(+)	license model year
category(+)	category_id name last_update
city(+)	city_id city country_id last_update
customer(+)	customer_id store_id first_name last_name email address_id active create_date last_update

Me and group

	OVERALL	Table Creation	Table Deletion and Alteration	Key Constraints	General Constraints	Tuple Insertion	Tuple Deletion	Tuple Update	SELECT FROM	Arithmetic Expressions	SELECT FROM WHERE	Pattern Matching	Multiple Table Queries	ORDER BY	Set Operations	Aggregate Functions	GROUP BY and HAVING	Sub-Queries	NULL-Values	Derived Relations and Views
Me																				
Me vs group																				
Group																				

12

Click on the a topic cell to display the activities inside

Load the rest of learners

Examples

Quizzes

Animated Examples

Lesslets

close

12.1

If the topic include animated examples, click one of the cells

Topic: Select - From - Where

Activity: Comparison Condition (2)

1 SELECT City, Sales, Target
FROM Offices

2 WHERE Sales < (.8 * Target);

3

4

5

6

Stack Frame

Database Console

12.2



An animation activity will be seen. This animation includes an SQL statement.

Press the play button to start the animation.

Here you can see the which part of the SQL statement is being executed by the animation. In this case, we are at 2nd step.

1 SELECT *
FROM Students

2 WHERE gpa > 3.2;

3

4

5

6

Stack Frame

WHERE condition narrows down the results into students whose gpa is higher than 3.2

Table:Students

Sid	Name	Age	Gpa
105	Jane	20	3.1
106	Marry	21	3.0
107	Dave	19	3.6

> 3.2

✗

> 3.2

✗

> 3.2

✓

Here, you can see an explanation based on the animation step.

This panel shows the states of the tables based on the SQL statement steps.

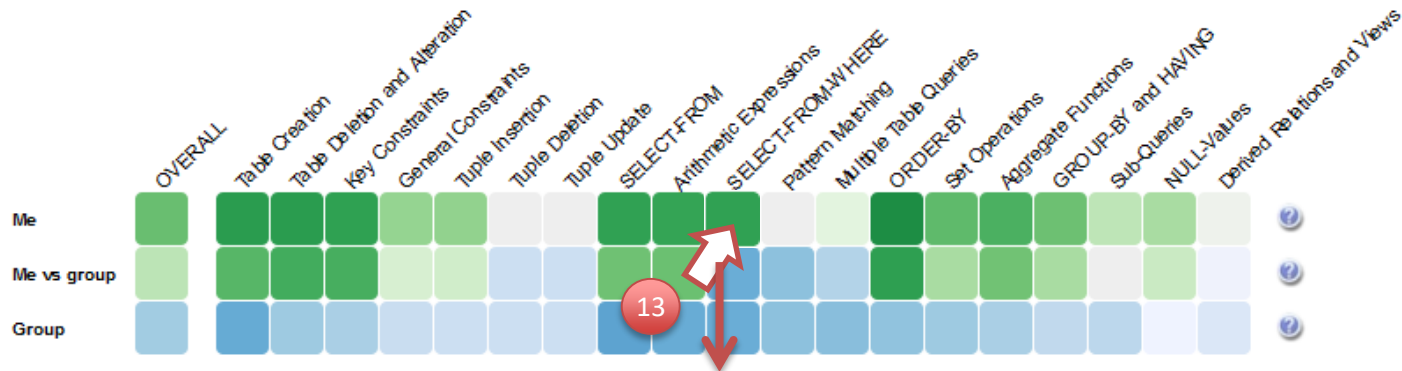
Moved one step backwards



12.3

You can press go to previous and next animation steps

Me and group



Click on the a topic cell to display the activities inside

Load the rest of learners

Examples

Quizzes

Animated Examples

Lesslets

13.1 If the topic include lesslets, click one of the cells

13.2

Scroll down or press minimize button to see the rest of the content in the lesslet.

Topic: SELECT-FROM-WHERE • Activity: Null Values 1

Description

Null Values

What is NULL value?

NULL value in SQL is a representation for a missing or unknown data.

You have to understand that NULL is **not** an equivalent of 0, an empty string (""), or boolean FALSE.

You should think of it as of the word **undefined**.

By default all fields in your table accept NULL values. It is wrong for keys and so while creating a table you should remember to add **NOT NULL** to all fields that are your key.

How can we test for NULL values?

OK, so now you may be wondering how you can pull tuples with NULL values out of your database.

Let's consider this query where I was trying to pull all tuples where I don't have specified address for my customers:


```
SELECT * FROM customers WHERE address = NULL;
```

Since NULL is undefined I **can't use operators such as =, >, or <**, because they will always return FALSE (in fact it returns *unknown*, but SQL interprets it as FALSE). So this query will always return an empty table.

Do you like this lesslet? [Like](#) [Dislike](#) [No comment](#)

A lesslet will be shown with a description, example and test part about an SQL topic. Here you can see the description part.

Topic: SELECT-FROM-WHERE • Activity: Null Values 1

Description 

Example

For a summary let's imagine that you are a database manager for PITT's office of international students and have a table *immigrants*:

Immigrants

student_id	first_name	last_name	country
clc18	Claude	Cole	England
fac21	Fabian	Cernik	France
aba1	Abu	Ajam	NULL
mik46	Michal	Kowalski	Poland
hyl5	Hyun	Lee	NULL
gua63	Gul	Alinejad	NULL
pin74	Piotr	Nowak	Poland
yai80	Yanick	Lefurgey	France
fac98	Fabian	Cernik	France
luc10	Luciano	Cavalli	Italy

Do you like this lesslet?

13.2

Again Scroll down or press minimize button to see the rest of the content in the lesslet.

Close window

You can like or dislike the lesslet which provide feedback to the content provider about how helpful this content is.

Topic: SELECT-FROM-WHERE • Activity: Null Values 1

Test

Q1 If you are trying to find all tuples where *balance* equals to NULL is this query the right way to do it?

```
SELECT * FROM accounts WHERE balance = NULL;
```

☐ Yes

☐ No

Q2 Which aggregate function does NOT ignore NULL?

☐ AVG()

☐ COUNT()

☐ SUM()

☐ MAX()

☐ MIN()

Q3 Is this query:

```
SELECT COUNT(*) FROM table1 WHERE A LIKE "%";
```

going to return tuples where A = NULL?

☐ Yes

☐ No

Do you like this lesslet?

Here, you can see the test part of the lesslet. Following the description you have read and the example you have practice, you can test your understanding in **Test** section.

13.3

Press Submit Test and submit your answers.