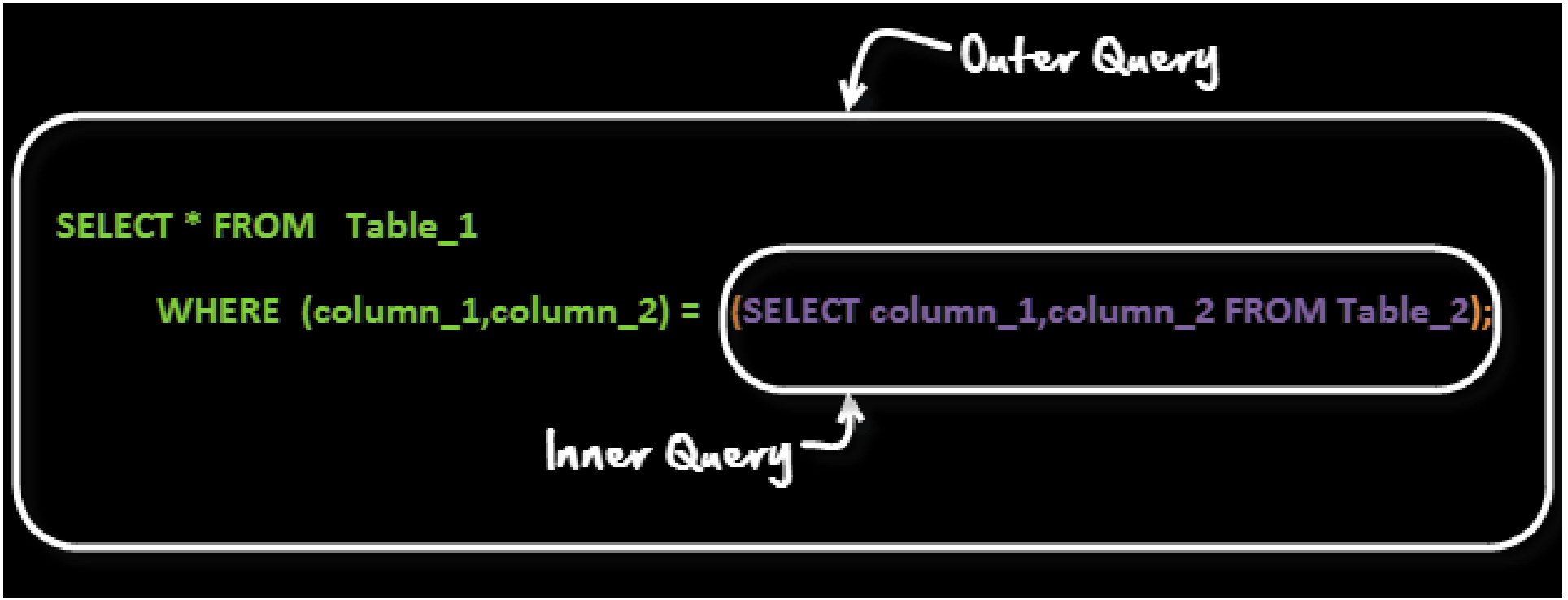
SUBQUERIES AND UNION

What are sub queries?

A sub query is a **select query** that is contained inside another query. The inner select query is usually used to determine the results of the outer select query.

Sub query syntax -

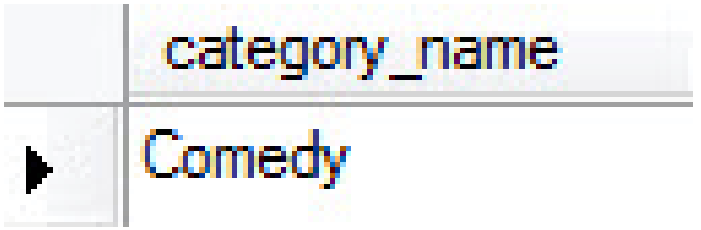


A common customer complaint at the MyFlix Video Library is the low number of movie titles. The management wants to buy movies for a category which has least number of titles.

You can use a query like

SELECT category_name FROM categories WHERE category_id =(SELECT MIN(category_id) from movies);

It gives a result



Let's see how this query works

First the INNER Query is executed

```
SELECT MIN(category_id) from movies
```

INNER Query gives following result

	MIN(category_id)
▶	1

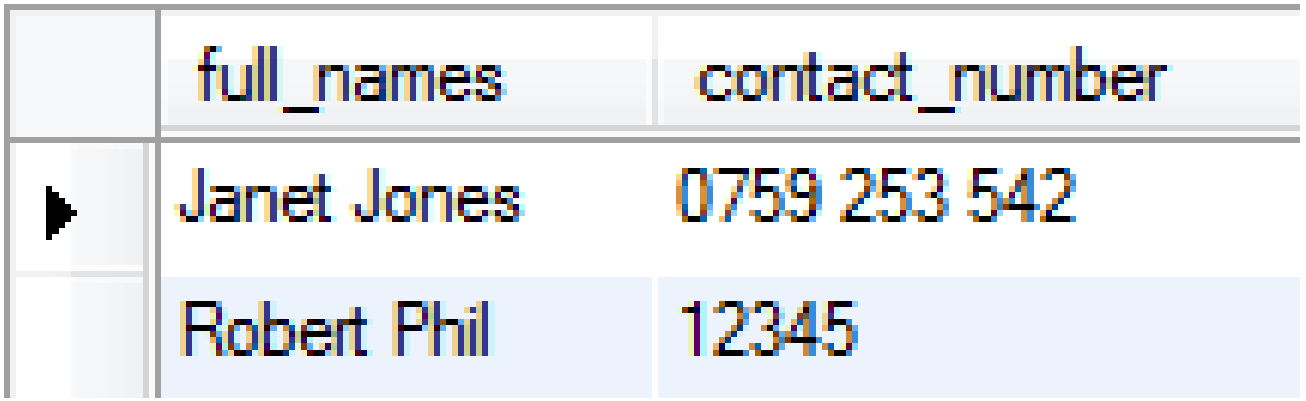
Output of INNER Query is substituted in OUTER Query

```
SELECT category_name FROM categories WHERE category_id =1
```

On Execution OUTER Query gives following Result

	category_name
▶	Comedy

- Suppose you want Names and Phone numbers of members of people who have rented a movie and are yet to return them. Once you get Names and Phone Number you call them up to give a reminder. You can use a query like
- **SELECT full_names,contact_number FROM members WHERE membership_number IN (SELECT membership_number FROM movierentals WHERE return_date IS NULL);**



full_names	contact_number
Janet Jones	0759 253 542
Robert Phil	12345

First the INNER Query is executed

```
SELECT membership_number FROM movierentals WHERE return_date IS NULL
```

INNER Query gives following result

membership_number
1
3

Output of INNER Query is substituted in OUTER Query

```
SELECT full_names,contact_number FROM   members  WHERE  membership_number IN (1,3)
```

On Execution OUTER Query gives following Result

full_names	contact_number
Janet Jones	0759 253 542
Robert Phil	12345

In this case, the inner query returns more than one results. The above is type of Table sub-query.

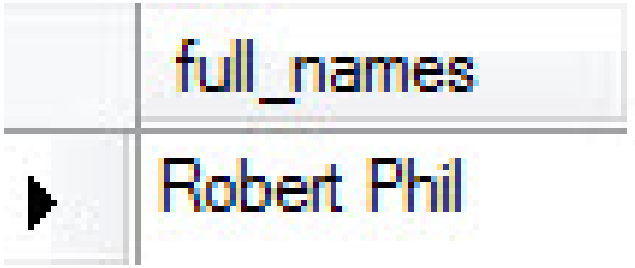
Till now we have seen two queries , lets now see an example of **triple query!!!**

Suppose the management wants to reward the highest paying member.

We can run a query like

Select full_names From members WHERE membership_number = (SELECT membership_number FROM payments WHERE amount_paid = (SELECT MAX(amount_paid) FROM payments));

The above query gives the following result -



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The above is a form of Row Sub-Query. In such sub-queries the , inner query can give only ONE result. The permissible operators when work with row subqueries are [=, >, =, <=, ,!=,]

Subqueries

- Subqueries are embedded queries inside another query. The embedded query is known as the inner query and the container query is known as the outer query.
- Sub queries are easy to use, offer great flexibility and can be easily broken down into single logical components making up the query which is very useful when Testing and debugging the queries.
- MySQL supports three types of subqueries, scalar, row and table subqueries.
- Scalar sub queries only return a single row and single column.

Contd...

- Row sub queries only return a single row but can have more than one column.
- Table subqueries can return multiple rows as well as columns.
- Subqueries can also be used in INSERT, UPDATE and DELETE queries.
- For performance issues, when it comes to getting data from multiple tables, it is strongly recommended to use JOINs instead of subqueries. Sub queries should only be used with good reason.

What is a union?

Unions combine the results from multiple SELECT queries into a consolidated result set.

The only requirements for this to work is that the number of columns should be the same from all the SELECT queries which needs to be combined .

Suppose we have two tables as follows.

Table1	
column1	column2
a	b
a	c
a	d

Table 2	
column1	column2
b	c
a	d

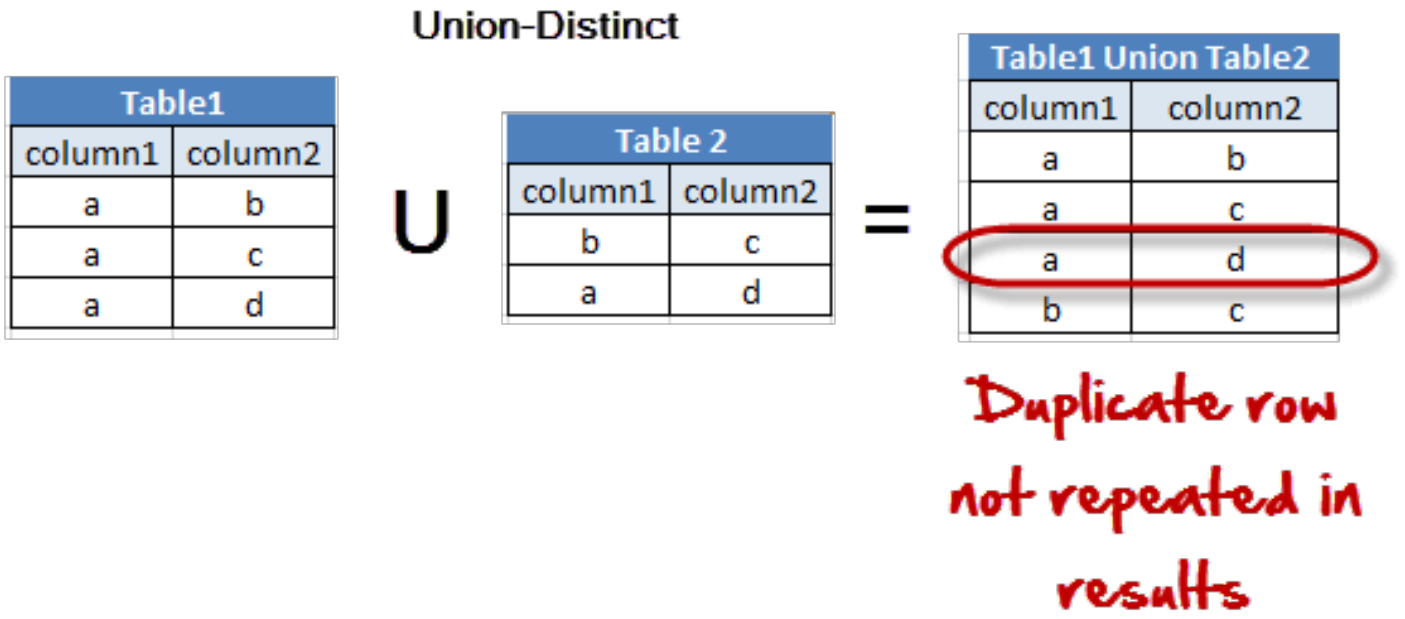
Let's now create a UNION query to combines both tables using DISTINCT

```
SELECT `column1`,` column1 FROM `table1`

UNION DISTINCT

SELECT ` column1`,` column1`  FROM `table2`;
```

Here duplicate rows are removed and only unique rows are returned.



Note: MySQL uses the DISTINCT clause as default when executing UNION queries if nothing is specified.

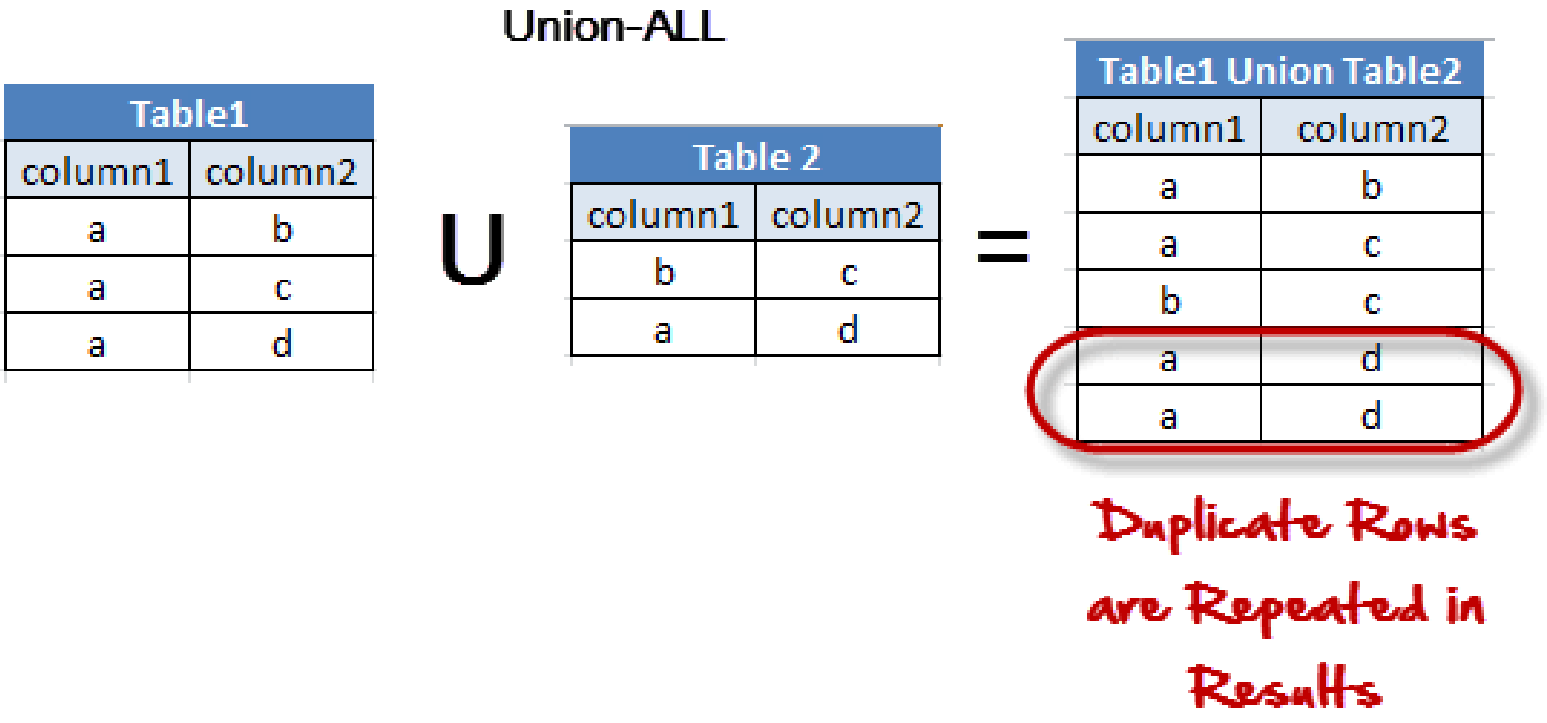
Let's now create a UNION query to combines both tables using ALL

SELECT `column1`,` column1` FROM `table1`

UNION ALL

SELECT ` column1`,` column1` FROM `table2`;

Here duplicate rows are included and since we use ALL.



Why use unions?

Suppose there is a flaw in your database design and you are using two different tables meant for the same purpose. You want to consolidate these two tables into one while omitting any duplicate records from creeping into the new table. You can use UNION in such cases.

Summary-Union

- The UNION command is used to combine more than one SELECT query results into a single query contain rows from all the select queries.
- The number of columns and data types in the SELECT statements must be the same in order for the UNION command to work.
- The DISTINCT clause is used to eliminate duplicate values from the UNION query result set. MySQL uses the DISTINCT clause as the default when executing UNION queries if nothing is specified.
- The ALL clause is used to return all even the duplicate rows in the UNION query.

Practical examples using MySQL workbench

membership_number and full_names from Members table with

movie_id and title from movies table

We can use the following query

```
SELECT `membership_number`,`full_names` FROM `members`
UNION
SELECT `movie_id`,`title` FROM `movies`;
```

Executing the above script in MySQL workbench against the myflixdb gives us the following results shown below.

membership_number	full_names
1	Janet Jones
2	Janet Smith Jones
3	Robert Phil
4	Gloria Williams
5	Leonard Hofstadter
6	Sheldon Cooper
7	Rajesh Koothrappali
8	Leslie Winkle

membership_number	full_names
1	Janet Jones
2	Janet Smith Jones
3	Robert Phil
4	Gloria Williams
5	Leonard Hofstadter