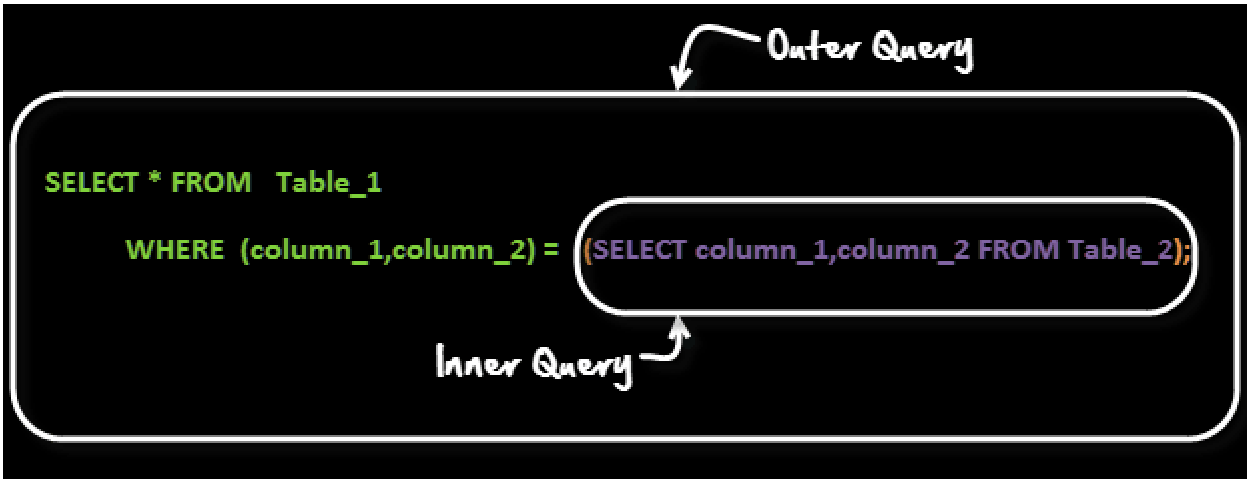
MySQL SubQuery Tutorial with Examples

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.

Let's look into the sub query syntax -



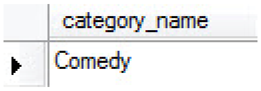
```
SELECT * FROM   Table_1
       WHERE  (column_1,column_2) =  (SELECT column_1,column_2 FROM Table_2);
```

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 the least number of titles.

You can use a query like

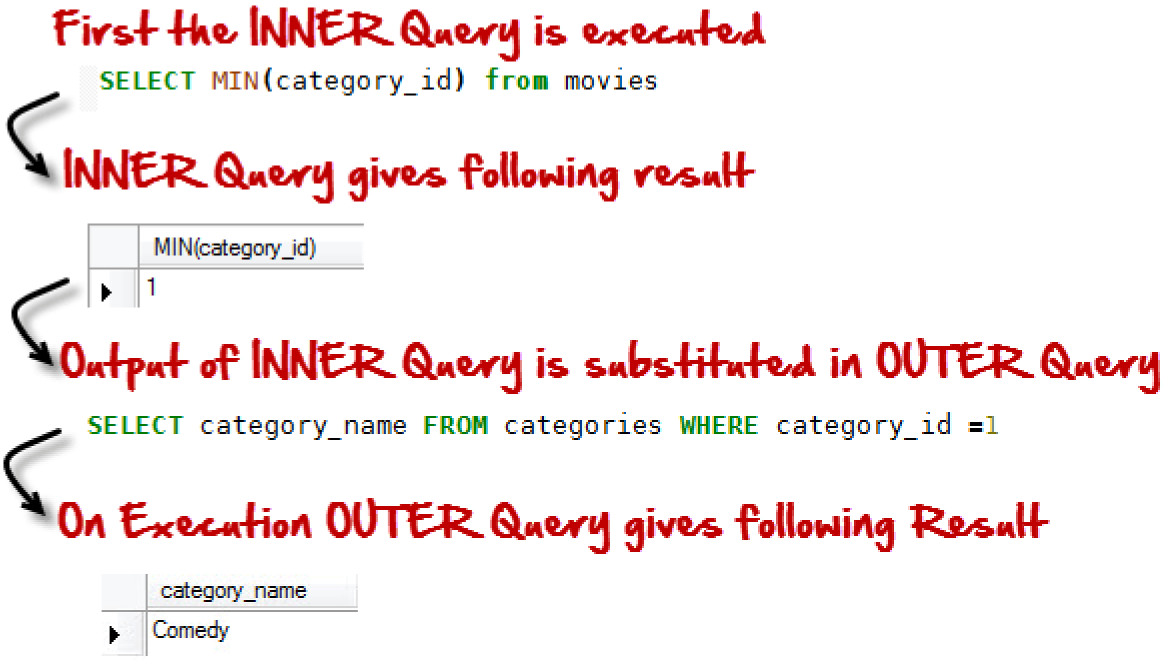
```
SELECT category_name FROM categories WHERE category_id =(
SELECT MIN(category_id) from movies);
```

It gives a result



	category_name
▶	Comedy

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

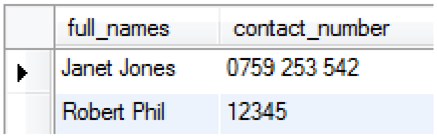
	category_name
▶	Comedy

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 [=, >, =, <=, ,!=,]

Let's look at another example ,

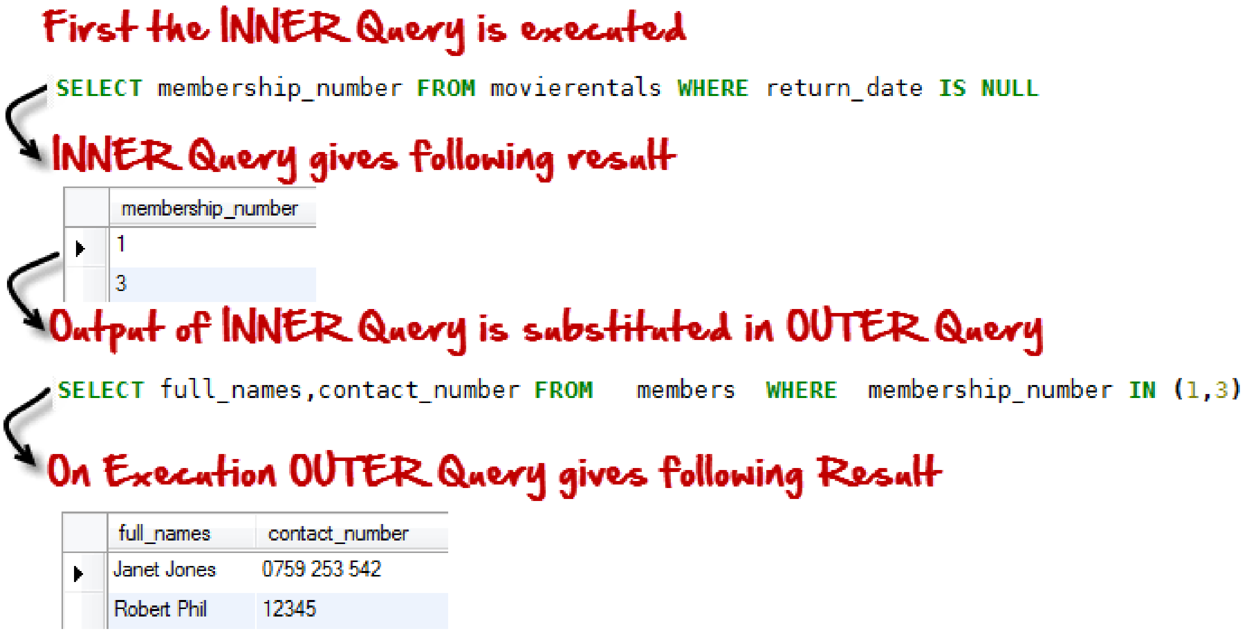
Suppose you want Names and Phone numbers of members of people who have rented a movie and are yet to return them. Once you get Names and Phone Number you call them up to give a reminder. You can use a query like

```
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

Let's see how this query works



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 result. The above is a type of T**able sub-quer**y.

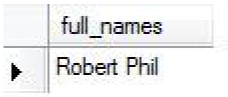
Till now we have seen two queries , let's now see an example of a triple **query**!!!

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 -



full_names
Robert Phil

Sub-Queries Vs Joins!

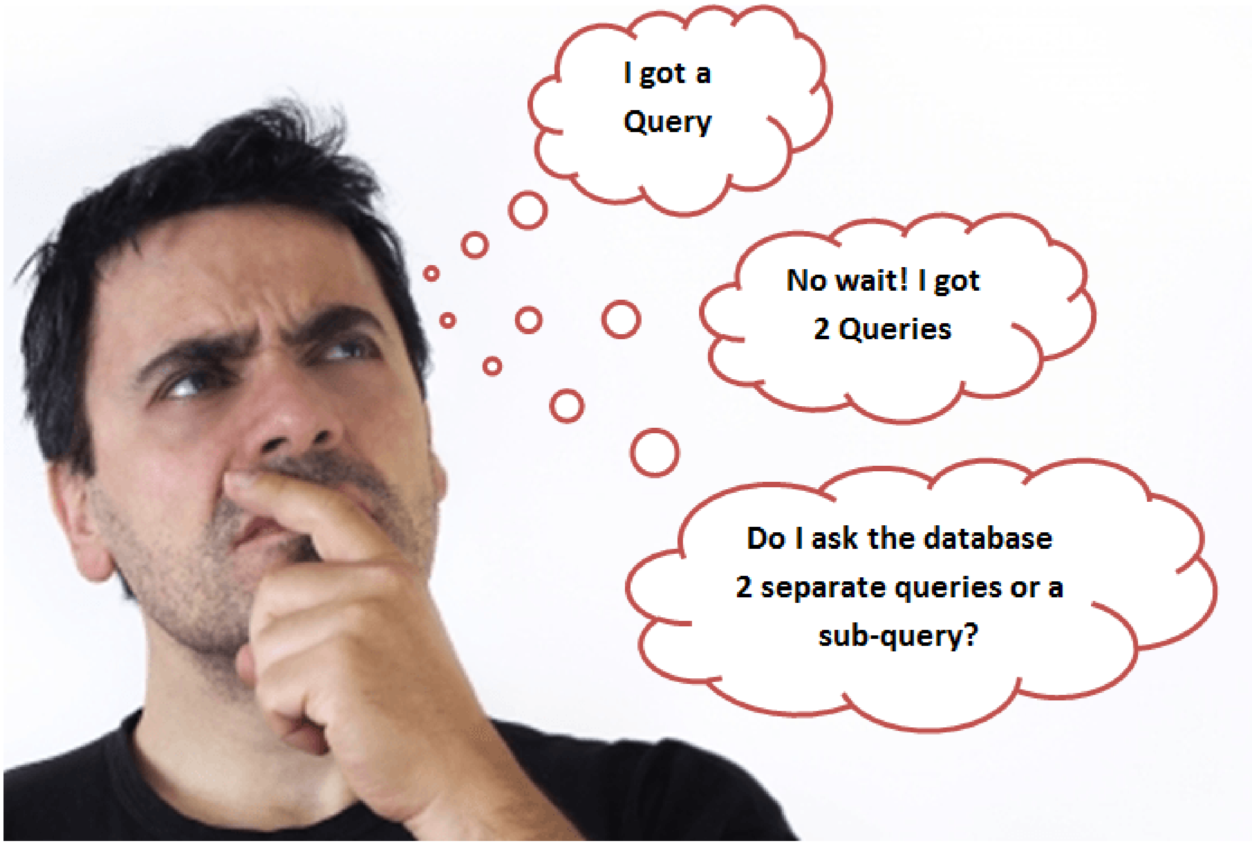
When compared with Joins , sub-queries are simple to use and easy to read. They are not as complicated as Joins

Hence they are frequently used by SQL beginners.

But sub-queries have performance issues. Using a join instead of a sub-query can at times give you up to 500 times performance boost.

Given a choice, it is recommended to use a JOIN over a subquery.

Sub-Queries should only be used as a fallback solution when you cannot use a JOIN operation to achieve the above



Summary

- 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 subqueries only return a single row and single column.
- Row subqueries 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