# Types of Subqueries

# Subquery Types?

## Types of subquery:

- MySQL **Non correlated** subquery
- **Multi-row, Single Column** subquery
- **Multi-Column** subquery
- MySQL **correlated** subquery
- MySQL subquery with **EXISTS** and **NOT EXISTS**

# Non Correlated Subqueries

- Most subquery are of this type unless writing UPDATE or DELETE statements
- Can appear on either side of the condition with comparison operators **=,<>, <, >, <=, >=**

**Find out all employees whose salary is greater than the average salary of all employees?**

```
select * from salaries where salary > (select avg(salary) from 
salaries);
```

When executing a query, MySQL evaluates the subquery first

The Subquery returns the average salary of all the employees

# Multiple-Row, Single-Column subqueries

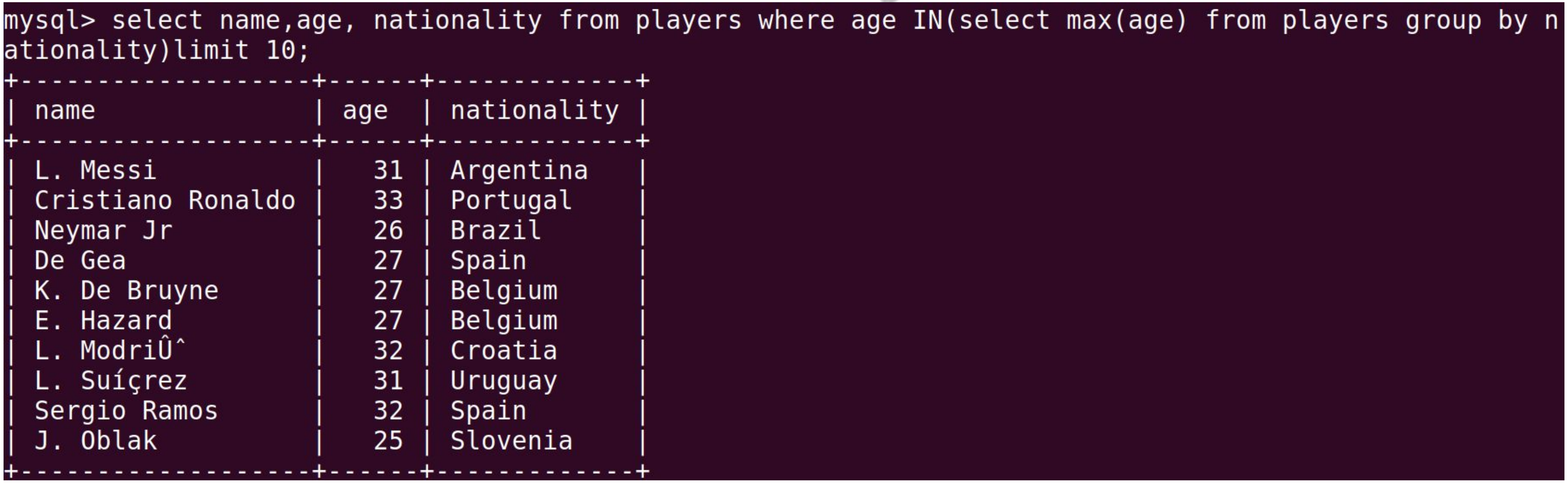
- **IN** and **NOT IN** operators
- The **ALL** operator
- The **ANY** operator

# IN and NOT IN operators

- The IN operator returns true if the comparison value is contained in the list

**Find name, age and nationality of players whose age is maximum in their respective nationalities?**

```
select name, age, nationality
from
players
where age IN
     (select max(age)
      from
      players
      group by nationality);
```



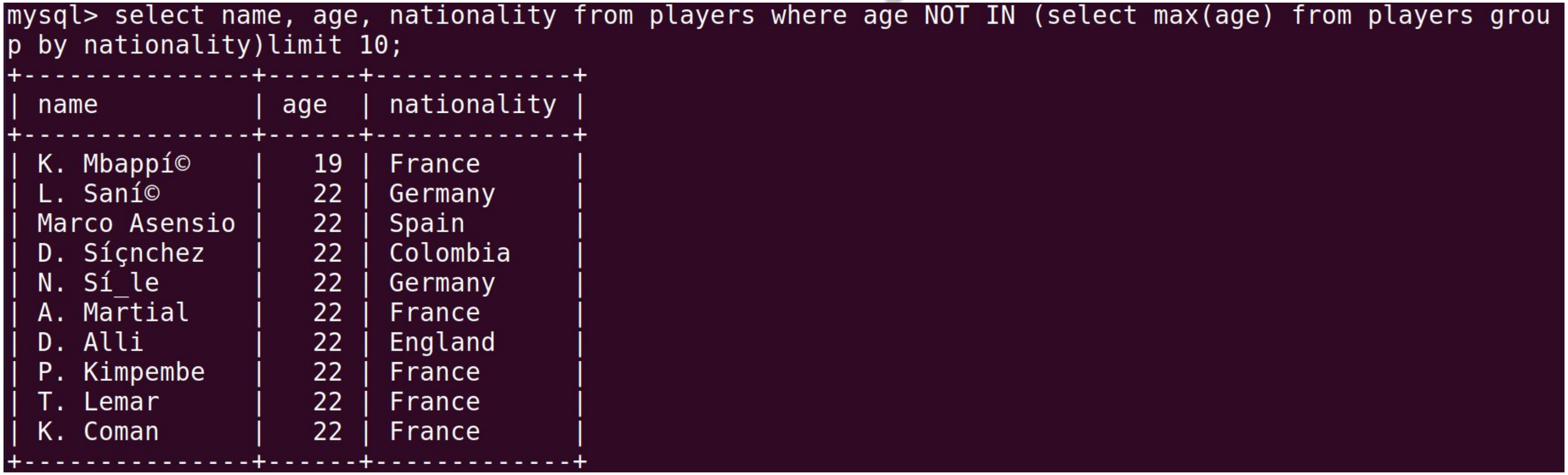
```
mysql> select name,age, nationality from players where age IN(select max(age) from players group by n
ationality)limit 10;
+-------------------+------+-------------+
| name              | age  | nationality |
+-------------------+------+-------------+
| L. Messi          |   31 | Argentina   |
| Cristiano Ronaldo |   33 | Portugal    |
| Neymar Jr         |   26 | Brazil      |
| De Gea            |   27 | Spain       |
| K. De Bruyne      |   27 | Belgium     |
| E. Hazard         |   27 | Belgium     |
| L. ModriÛˆ        |   32 | Croatia     |
| L. Suíçrez        |   31 | Uruguay     |
| Sergio Ramos      |   32 | Spain       |
| J. Oblak          |   25 | Slovenia    |
+-------------------+------+-------------+
```

# IN and NOT IN operators

- The **NOT IN** operator is used to check the converse of the **IN** operator

**Find name, age and nationality of players whose age is not the maximum age in their respective nationalities?**

```
select name, age, nationality
from
players
where age NOT IN
     (select max(age)
      from
      players
      group by nationality);
```



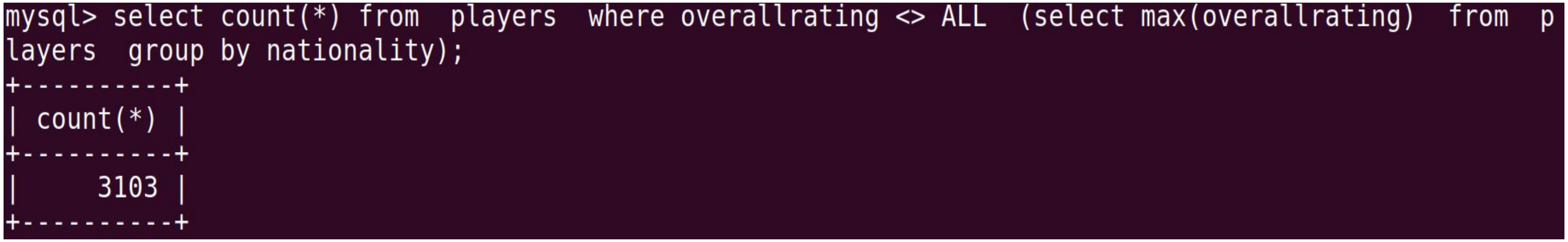
```
mysql> select name, age, nationality from players where age NOT IN (select max(age) from players grou
p by nationality)limit 10;
+---------------+------+-------------+
| name          | age  | nationality |
+---------------+------+-------------+
| K. Mbappí©    |   19 | France      |
| L. Saní©      |   22 | Germany     |
| Marco Asensio |   22 | Spain       |
| D. Síçnchez   |   22 | Colombia    |
| N. Sí_le      |   22 | Germany     |
| A. Martial    |   22 | France      |
| D. Alli       |   22 | England     |
| P. Kimpembe   |   22 | France      |
| T. Lemar      |   22 | France      |
| K. Coman      |   22 | France      |
+---------------+------+-------------+
```

# The ALL operator

- The **ALL** operator is used to compare single and every value in a set
- To build a condition any of the operators**(=,<>,<,>,etc.)** can be used with the **ALL** operator

**Find count of all players whose overall rating does not equal to the maximum overall rating from any nationality?**

```
select count(*)
from
players
where overallrating <> ALL
     (select max(overallrating)
     from
     players
     group by nationality);
```



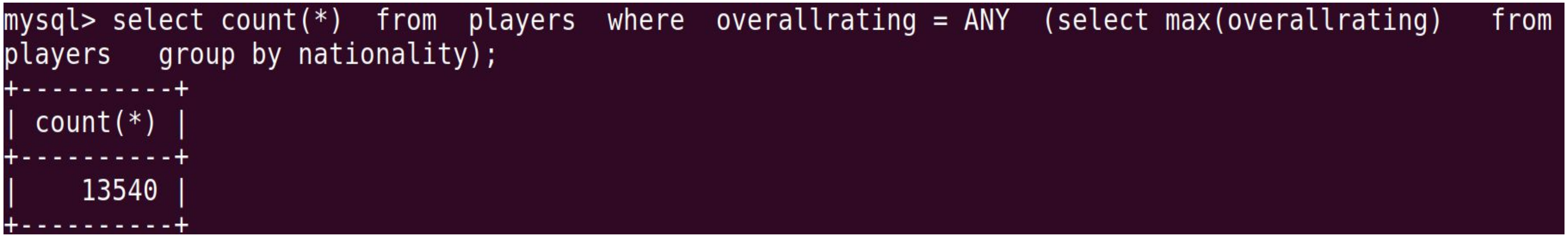
```
mysql> select count(*) from  players  where overallrating <> ALL  (select max(overallrating)  from  p
layers  group by nationality);
+----------+
| count(*) |
+----------+
|     3103 |
+----------+
```

# The ANY operator

- Allows a value to be compared to the members of a set of values
- Evaluates to true as soon as a single comparison is favorable

**Find count of all players whose overall rating equals to the maximum overall rating from any nationality?**

```
select count(*)
from
players
where
overallrating = ANY
     (select max(overallrating)
      from players
      group by nationality);
```



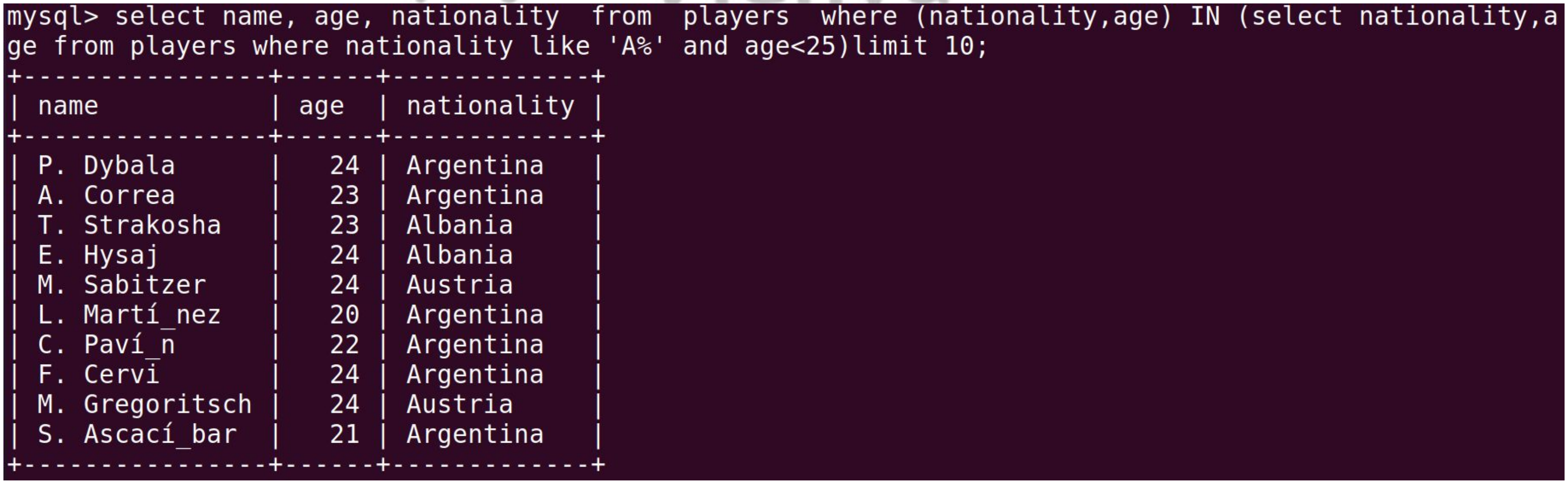
```
mysql> select count(*)  from  players  where  overallrating = ANY  (select max(overallrating)   from
players   group by nationality);
+----------+
| count(*) |
+----------+
|    13540 |
+----------+
```

# Multicolumn Subqueries

- The subquery returns two or more columns
- Column names should be in the same order as returned by the subquery.

**Find name, age and nationality of players whose nationality starts with A and age is less than 25?**

```
select name, age, nationality
from
players
where (nationality,age) IN
     (select nationality,age
     from players
     where nationality
     like 'A%' and age<25);
```



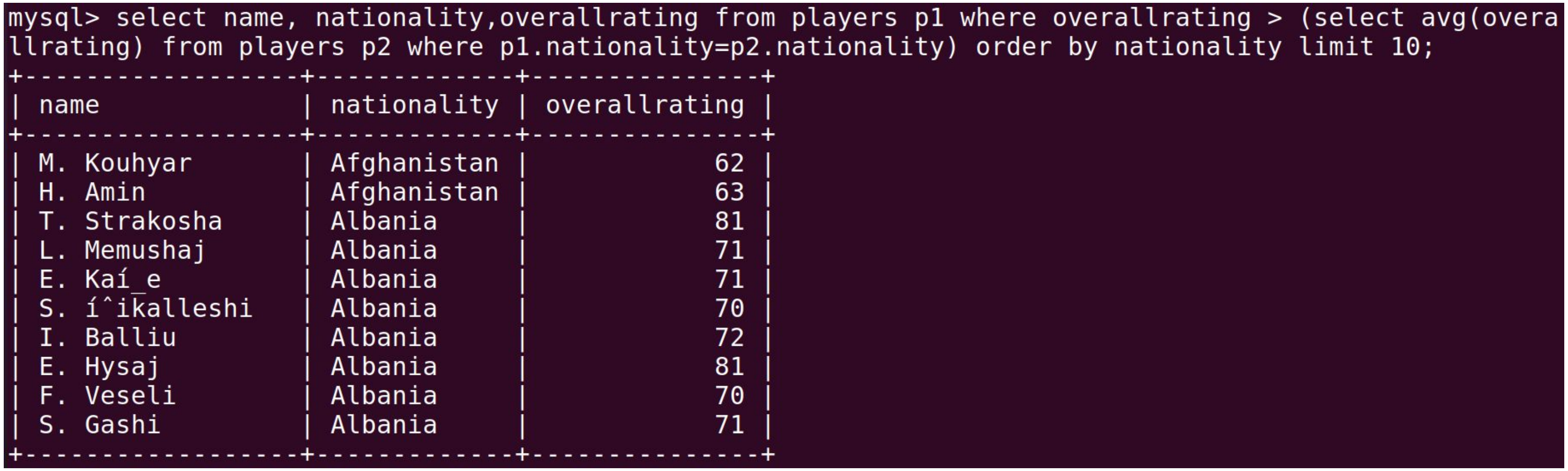
```
mysql> select name, age, nationality  from  players  where (nationality,age) IN (select nationality,a
ge from players where nationality like 'A%' and age<25)limit 10;
+----------------+------+-------------+
| name           | age  | nationality |
+----------------+------+-------------+
| P. Dybala      |   24 | Argentina   |
| A. Correa      |   23 | Argentina   |
| T. Strakosha   |   23 | Albania     |
| E. Hysaj       |   24 | Albania     |
| M. Sabitzer    |   24 | Austria     |
| L. Martí_nez   |   20 | Argentina   |
| C. Paví_n      |   22 | Argentina   |
| F. Cervi       |   24 | Argentina   |
| M. Gregoritsch |   24 | Austria     |
| S. Ascací_bar  |   21 | Argentina   |
+----------------+------+-------------+
```

# Correlated Subqueries

- Correlated subquery is dependent on its containing statement from which it references one or more columns

**Find name, nationality and overall rating of players whose overall rating is greater than the average rating of players within the same nationality?**

```
select name, nationality, overallrating
from
players p1
where overallrating >
     (select avg(overallrating)
     from
     players p2
     where p1.nationality=p2.nationality)
     order by nationality
```



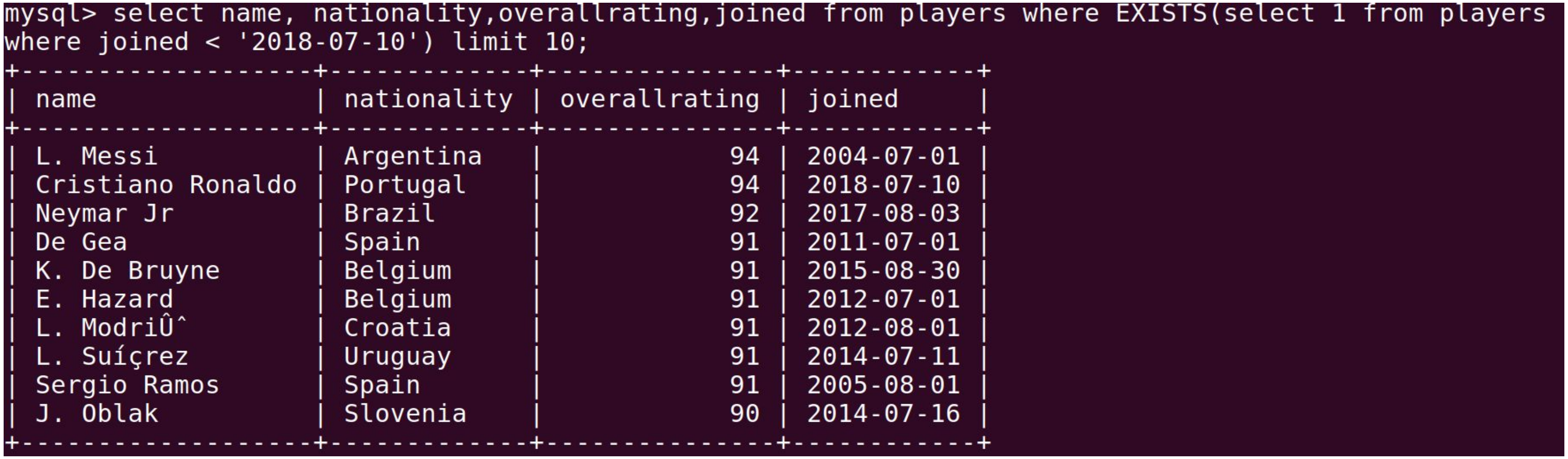
```
mysql> select name, nationality,overallrating from players p1 where overallrating > (select avg(overa
llrating) from players p2 where p1.nationality=p2.nationality) order by nationality limit 10;
+------------------+-------------+---------------+
| name             | nationality | overallrating |
+------------------+-------------+---------------+
| M. Kouhyar       | Afghanistan |            62 |
| H. Amin          | Afghanistan |            63 |
| T. Strakosha     | Albania     |            81 |
| L. Memushaj      | Albania     |            71 |
| E. Kaí_e         | Albania     |            71 |
| S. í^ikalleshi   | Albania     |            70 |
| I. Balliu        | Albania     |            72 |
| E. Hysaj         | Albania     |            81 |
| F. Veseli        | Albania     |            70 |
| S. Gashi         | Albania     |            71 |
+------------------+-------------+---------------+
```

# EXISTS Operator

- You use the exists operator when you want to identify that a relationship exists without regard for the quantity
- Using the exists operator, your subquery can return zero, one, or many rows

**Find name, nationality and overall rating joining date of players who have joined before 2018-07-10**

```
select name, nationality, overallrating, joined
from
players
where EXISTS
     (select 1
      from players
      where
     joined < '2018-07-10');
```



```
mysql> select name, nationality,overallrating,joined from players where EXISTS(select 1 from players
where joined < '2018-07-10') limit 10;
+-------------------+-------------+---------------+------------+
| name              | nationality | overallrating | joined     |
+-------------------+-------------+---------------+------------+
| L. Messi          | Argentina   |            94 | 2004-07-01 |
| Cristiano Ronaldo | Portugal    |            94 | 2018-07-10 |
| Neymar Jr         | Brazil      |            92 | 2017-08-03 |
| De Gea            | Spain       |            91 | 2011-07-01 |
| K. De Bruyne      | Belgium     |            91 | 2015-08-30 |
| E. Hazard         | Belgium     |            91 | 2012-07-01 |
| L. ModriÛˆ        | Croatia     |            91 | 2012-08-01 |
| L. Suíçrez        | Uruguay     |            91 | 2014-07-11 |
| Sergio Ramos      | Spain       |            91 | 2005-08-01 |
| J. Oblak          | Slovenia    |            90 | 2014-07-16 |
+-------------------+-------------+---------------+------------+
```

# Thank You