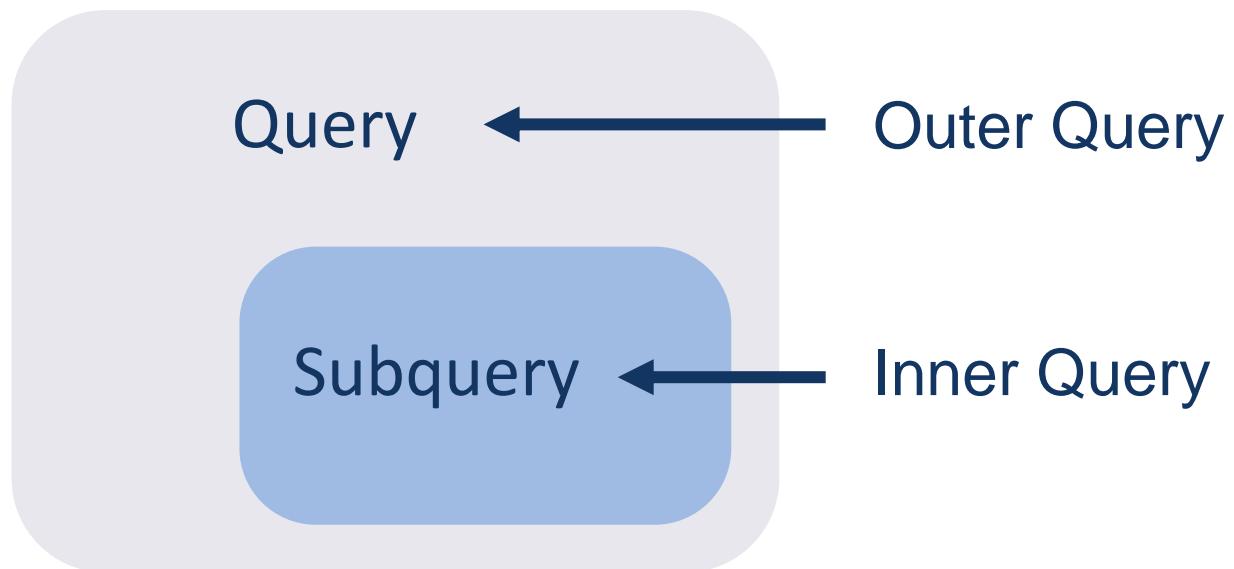


>>

Subqueries

```
( SELECT  
    AVG(price)  
  FROM Products )
```

◀ Subqueries



◀ Syntax

```
( SELECT MAX(qty) FROM Sales )
```

2 types:

- **self-contained**
- **correlated**



Example

self-contained
correlated

Details of the product(s) with the highest price

```
SELECT name, color, price  
FROM Products  
WHERE price = (
```

```
SELECT MAX(price)  
FROM Products
```

name	color	price
ball	blue	743
rope	brown	743

743

scalar



Example

self-contained
correlated

Order details of customers in city Ede

```
SELECT orderdate, ordertotal  
FROM Orders  
WHERE custid IN (
```

```
)  
SELECT id  
FROM Customers  
WHERE city = 'Ede'
```

orderdate	ordertotal
2021-09-21	128.50
2020-11-03	64.00
2021-10-15	76.40

22, 37, 48

👉 multi-valued

Again ...

self-contained
correlated

```
SELECT name, color, price  
FROM Products  
WHERE price =  
(
```

```
    SELECT MAX(price)  
    FROM Products
```

```
)
```

743

```
SELECT orderdate, ordertotal  
FROM Orders  
WHERE custid IN  
(
```

```
    SELECT id  
    FROM Customers  
    WHERE city = 'Ede'
```

```
)
```

22,
37,
48

scalar

multi-valued

► Rewrite to a JOIN

self-contained
correlated

Subquery

```
SELECT orderdate, orderdertotal
FROM Orders
WHERE custid IN
(
    SELECT id
    FROM Customers
    WHERE city = N'Ede'
);
```

JOIN

```
SELECT o.orderdate, o.orderdertotal
FROM Orders AS o
INNER JOIN Customers AS c
ON o.custid = c.id
WHERE c.city = N'Ede';
```

👉 multi-valued

Example

self-contained
correlated

Most recent orderdate for each customer

```
SELECT o.custid, o.orderdate  
FROM Orders AS o  
WHERE o.orderid = (
```

```
)  
SELECT MAX(id)  
FROM Orders  
WHERE custid = 2
```

custid	orderdate
1	2020-04-01
2	2022-01-06
...	...

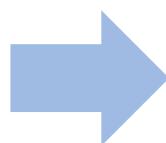
1

43

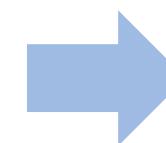


EXISTS

JOIN



selfcontained
subquery



correlated subquery
with EXISTS

```
SELECT
    o.*
FROM Employees AS e
INNER JOIN Orders AS o
ON e.empid = o.empid
WHERE e.country = N'UK';
```

```
SELECT
    *
FROM Orders
WHERE empid IN
(
    SELECT empid
    FROM Employees
    WHERE country = N'UK'
);
```

```
SELECT
    *
FROM Orders AS o
WHERE EXISTS
(
    SELECT 1
    FROM Employees
    WHERE country = 'UK'
    AND empid = o.empid
);
```