

Subquery and Correlated Subquery

```
create database Prod_Sales;
use Prod_Sales;
```

```
Create Table ProdTable
(
    Id int identity primary key,
    ProdName nvarchar(50),
    ProdDesc nvarchar(250)
)
```

```
Create Table SalesTable
(
    Id int primary key identity,
    ProductId int foreign key references ProdTable(Id),
    UnitPrice int,
    QuantitySold int
)
```

```
Insert into ProdTable values ('TV', '52 inch black color LCD TV')
Insert into ProdTable values ('Laptop', 'Very thin black color acer laptop')
Insert into ProdTable values ('Desktop', 'HP high performance desktop')
```

```
Insert into SalesTable values(3, 450, 5)
Insert into SalesTable values(2, 250, 7)
Insert into SalesTable values(3, 450, 4)
Insert into SalesTable values(3, 450, 9)
```

```
Select * From ProdTable;
Select * From SalesTable;
```

Write a query to retrieve products that are not at all sold?

```
Select Id, ProdName, ProdDesc
from ProdTable
where Id not in (Select ProductId from SalesTable)
```

```
Select Id, ProdName, ProdDesc
from ProdTable
where Id not in (Select Distinct ProductId from SalesTable)
```

Most of the times sub queries can be very easily replaced with joins.
The above query is rewritten using joins and produces the same results.

```
Select * From ProdTable;
Select * From SalesTable;
```

```
Select *
from ProdTable
left join SalesTable
on ProdTable.Id = SalesTable.ProductId
where SalesTable.ProductId IS NULL;
```

```
Select ProdTable.Id, ProdName, ProdDesc
from ProdTable
left join SalesTable
on ProdTable.Id = SalesTable.ProductId
where SalesTable.ProductId IS NULL;
```

Write a query to retrieve the ProdName and TotalQuantity sold, using a subquery.

```
Select * From ProdTable;
Select * From SalesTable;
```

```
Select ProdName, (Select SUM(QuantitySold)
from SalesTable
where ProductId = ProdTable.Id) as TotalQuantity
from ProdTable
order by ProdName;
```

Query with an equivalent join that produces the same result.

```
Select * From ProdTable;
Select * From SalesTable;
```

```
Select ProdName, SUM(QuantitySold) as TotalQuantity
from ProdTable
left join SalesTable
on ProdTable.Id = SalesTable.ProductId
group by ProdName
order by ProdName
```

sub query is executed first and only once.
The sub query results are then used by the outer query.
A non-correlated subquery can be executed independently of the outer query.

```
Select Id, ProdName, ProdDesc
from ProdTable
where Id not in (Select Distinct ProductId from SalesTable)
```

If the subquery depends on the outer query for its values, then that sub query is called as a correlated subquery.
Correlated subqueries get executed, once for every row that is selected by the outer query.
Correlated subquery, cannot be executed independently of the outer query.

```
Select ProdName, (Select SUM(QuantitySold)
from SalesTable
where ProductId = ProdTable.Id) as TotalQuantity
from ProdTable
order by ProdName
```