

- GROUP BY ... ROLL UP

```
12
13 -- Demo above with use of ROLLUP option
14 -- No total rows are produced for the second field listed in the GROUP BY clause.
15 SELECT ProductID, SpecialOfferID, SUM(OrderQty) AS [Total Sold]
16 FROM Sales.SalesOrderDetail
17 GROUP BY ProductID, SpecialOfferID WITH ROLLUP
18 ORDER BY ProductID, SpecialOfferID;
19
20 -- Demo above with use of CUBE option
```

ProductID	SpecialOfferID	Total Sold
707	NULL	274914
707	1	6296
707	2	5368
707	3	452
707	8	122
707	11	162
707	11	222
708	NULL	6532
708	1	5368
708	2	595
708	3	192
708	8	153
708	11	224
709	NULL	1107
709	1	745

- WITH CUBE

```
18 ORDER BY ProductID, SpecialOfferID;
19
20 -- Demo above with use of CUBE option
21 -- Total rows are produced for every combination of fields listed in the GROUP BY clause.
22 SELECT ProductID, SpecialOfferID, SUM(OrderQty) AS [Total Sold]
23 FROM Sales.SalesOrderDetail
24 GROUP BY ProductID, SpecialOfferID WITH CUBE
25 ORDER BY ProductID, SpecialOfferID;
26
27
```

Product	SpecialOfferID	Total S.
707	NULL	274914
707	1	238944
707	2	18181
707	3	10773
707	4	2321
707	5	85
707	6	495

SQL IDENTITY Property

- Used with INT data type
- Automatically created by SQL Server
- Commonly used with Primary Keys (surrogate keys)
- Only one column with the IDENTITY property per table

IDENT_CURRENT
@@IDENTITY
SCOPE_IDENTITY()

- SUBQUERY

SIMPLE SUBQUERY

(没有用到任何外表的值， 不被外表驱动)

```
12
13 SELECT *
14 FROM Products
15 WHERE ProductID = (SELECT MAX(ProductID) FROM Products);
16
17
18 -- Correlated Subquery
```

Product	ProductName	Supplier	Category	QuantityPer	UnitPri	UnitInSto	UnitsOnOr	ReorderLe	Discontin
77	Original Frankfurter grüne Soße	12	2	12 boxes	13.00	32	0	15	0

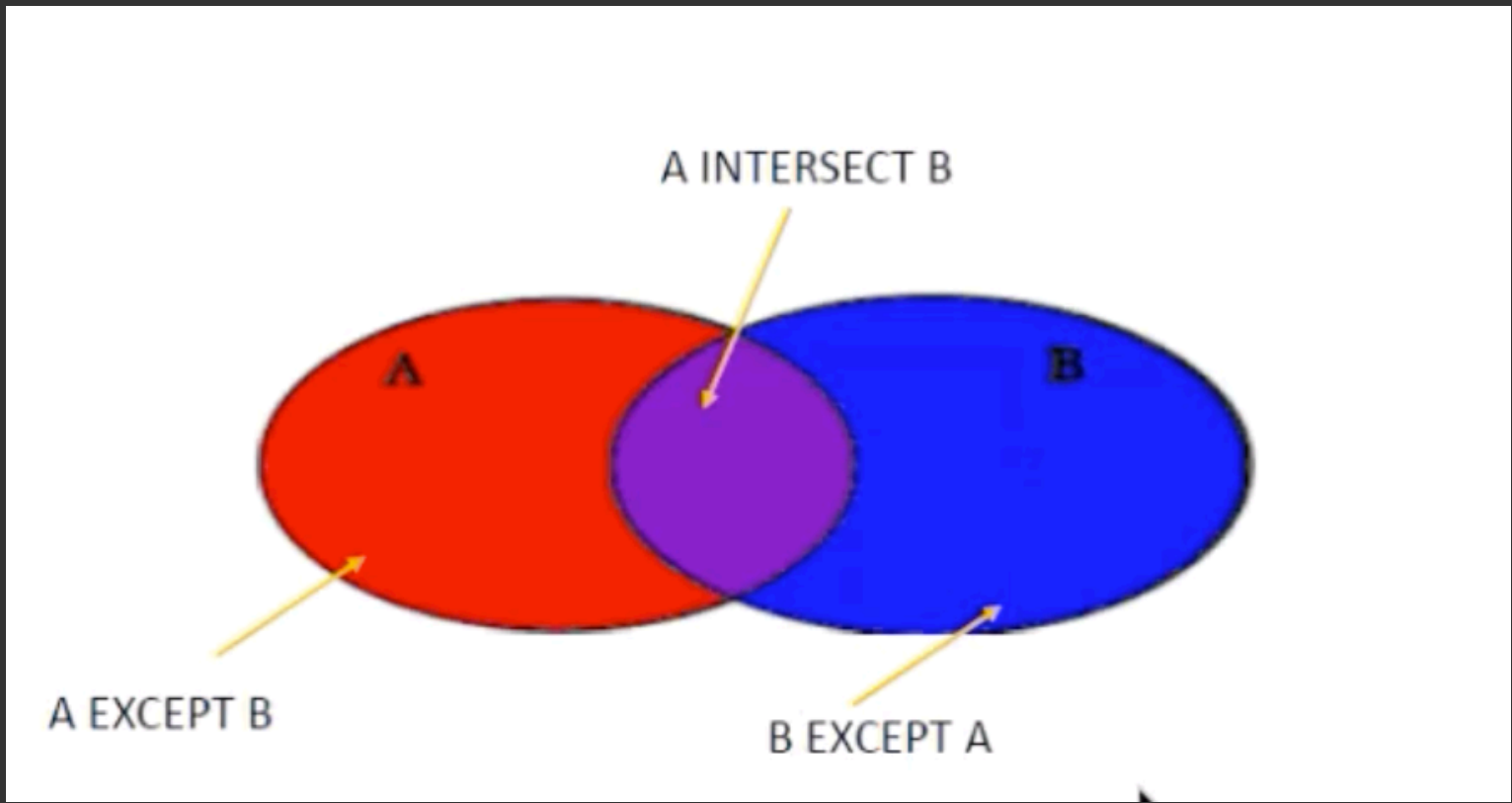
CORRELATED SUBQUERY

```
22
23 SELECT C.CompanyName,
24        C.City,
25        C.Country,
26        (SELECT Count(SupplierID)
27         FROM Suppliers S
28         WHERE S.Country = C.Country) AS [Total Suppliers]
29 FROM Customers C
30
31
```

CompanyName	City	Country	Total Suppli...
Alfreds Futterkiste	Berlin	Germany	3
Ana Trujillo Emparedados y helados	México D.F.	Mexico	0
Antonio Moreno Taquería	México D.F.	Mexico	0
Around the Horn	London	UK	2
Berglunds snabbköp	Luleå	Sweden	2
Blauser See Delikatessen	Mannheim	Germany	3
Blondesddsl père et fils	Strasbourg	France	3

Driven by outer query

- INTERSECT AND EXCEPT Commands



Basic rules for these commands:

- Number and orders of columns must be same
- Data type must be same or compatible

```
2
3 -- Uses EXCEPT
4 SELECT ProductID FROM Production.Product
5 EXCEPT
6 SELECT ProductID FROM Sales.SalesOrderDetail;
7
8 -- Uses IN and a subquery
9 SELECT DISTINCT ProductID
10 FROM Production.Product
11 WHERE ProductID NOT IN (SELECT DISTINCT ProductID FROM Sales.SalesOrderDetail);
12
13 -- Uses LEFT JOIN
14 SELECT DISTINCT P.ProductID
15 FROM Production.Product P
16 LEFT JOIN Sales.SalesOrderDetail S
17 ON P.ProductID = S.ProductID
18 WHERE S.ProductID IS NULL;
```

Type of Indexes

- clustered
 - Leaf node is actual data pages
- Non-clustered
 - Leaf node is key pointer to data
- Both are unique or non-unique

数据库索引

<https://zhidao.baidu.com/question/92889097.html>