UNIVERSIDAD PRIVADA DE TACNA

FACULTAD DE INGENIERIA

Escuela Profesional de Ingeniería de Sistemas

Sesión 02 - Utilizando Operadores de Conjuntos de Datos

Curso: *Base de Datos II*

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Sesión N° 02 - Utilizando Operadores de Conjuntos de Datos

1. Operador UNION

1.1. Conectar con la BD TSQL

In [1]:

```
USE TSQL;
GO
```

Commands completed successfully.

Total execution time: 00:00:00.005

1.2. El operador UNION ALL devuelve todas las filas de ambas tablas incluyendo duplicados

In [2]:

```
SELECT country, region, city FROM HR.Employees
UNION ALL -- 100 rows
SELECT country, region, city FROM Sales.Customers;
```

(100 rows affected)

Total execution time: 00:00:00.034

Out[2]:

country	region	city
USA	WA	Seattle
USA	WA	Tacoma
USA	WA	Kirkland
USA	WA	Redmond
UK	NULL	London
UK	NULL	London
UK	NULL	London
USA	WA	Seattle
UK	NULL	London
Germany	NULL	Berlin
Mexico	NULL	México D.F.
Mexico	NULL	México D.F.
UK	NULL	London
Sweden	NULL	Luleå
Germany	NULL	Mannheim
France	NULL	Strasbourg
Spain	NULL	Madrid
France	NULL	Marseille
Canada	BC	Tsawassen
UK	NULL	London
Argentina	NULL	Buenos Aires

Argentina	NULL	Buenos Aires
Mexico	NULL	México D.F.
Switzerland	NULL	Bern
Brazil	SP	Sao Paulo
UK	NULL	London
Germany	NULL	Aachen
France	NULL	Nantes
UK	NULL	London
Austria	NULL	Graz
Brazil	SP	Sao Paulo
Spain	NULL	Madrid
France	NULL	Lille
Sweden	NULL	Bräcke
Germany	NULL	München
France	NULL	Nantes
Italy	NULL	Torino
Portugal	NULL	Lisboa
Spain	NULL	Barcelona
Spain	NULL	Sevilla
Brazil	SP	Campinas
USA	OR	Eugene
Venezuela	DF	Caracas
Brazil	RJ	Rio de Janeiro
Venezuela	Táchira	San Cristóbal
USA	OR	Elgin
Ireland	Co. Cork	Cork
UK	Isle of Wight	Cowes
Germany	NULL	Brandenburg
France	NULL	Versailles
France	NULL	Toulouse
Canada	BC	Vancouver
USA	WA	Walla Walla
Germany	NULL	Frankfurt a.M.
USA	CA	San Francisco
Venezuela	Lara	Barquisimeto
Venezuela	Nueva Esparta	I. de Margarita
USA	OR	Portland
Italy	NULL	Bergamo
Belgium	NULL	Bruxelles
Canada	Québec	Montréal
Germany	NULL	Leipzig
UK	NULL	London
Argentina	NULL	Buenos Aires
USA	AK	Anchorage
Germany	NULL	Köln
France	NULL	Paris

France	NULL	Paris
Mexico	NULL	México D.F.
Austria	NULL	Salzburg
Portugal	NULL	Lisboa
Brazil	RJ	Rio de Janeiro
Brazil	SP	Sao Paulo
Germany	NULL	Cunewalde
Argentina	NULL	Buenos Aires
USA	NM	Albuquerque
Italy	NULL	Reggio Emilia
Brazil	RJ	Rio de Janeiro
Switzerland	NULL	Genève
Spain	NULL	Madrid
Norway	NULL	Stavern
USA	ID	Boise
UK	NULL	London
Denmark	NULL	Kobenhavn
France	NULL	Paris
USA	WY	Lander
Belgium	NULL	Charleroi
USA	OR	Portland
USA	MT	Butte
Germany	NULL	Münster
Mexico	NULL	México D.F.
Brazil	SP	Sao Paulo
USA	WA	Kirkland
Denmark	NULL	Århus
France	NULL	Lyon
France	NULL	Reims
Germany	NULL	Stuttgart
Finland	NULL	Oulu
Brazil	SP	Resende
USA	WA	Seattle
Finland	NULL	Helsinki
Poland	NULL	Warszawa

1.3. El operador UNION ALL devuelve todas las filas de ambas tablas excluyendo duplicados

In [3]:

```sql
SELECT country, region, city FROM HR.Employees
UNION
SELECT country, region, city FROM Sales.Customers;
```

(71 rows affected)

Total execution time: 00:00:00.048

Out[3]:

country	region	city

Argentina	NULL	Buenos Aires
Austria	NULL	Graz
Austria	NULL	Salzburg
Belgium	NULL	Bruxelles
Belgium	NULL	Charleroi
Brazil	RJ	Rio de Janeiro
Brazil	SP	Campinas
Brazil	SP	Resende
Brazil	SP	Sao Paulo
Canada	BC	Tsawassen
Canada	BC	Vancouver
Canada	Québec	Montréal
Denmark	NULL	Århus
Denmark	NULL	Kobenhavn
Finland	NULL	Helsinki
Finland	NULL	Oulu
France	NULL	Lille
France	NULL	Lyon
France	NULL	Marseille
France	NULL	Nantes
France	NULL	Paris
France	NULL	Reims
France	NULL	Strasbourg
France	NULL	Toulouse
France	NULL	Versailles
Germany	NULL	Aachen
Germany	NULL	Berlin
Germany	NULL	Brandenburg
Germany	NULL	Cunewalde
Germany	NULL	Frankfurt a.M.
Germany	NULL	Köln
Germany	NULL	Leipzig
Germany	NULL	Mannheim
Germany	NULL	München
Germany	NULL	Münster
Germany	NULL	Stuttgart
Ireland	Co. Cork	Cork
Italy	NULL	Bergamo
Italy	NULL	Reggio Emilia
Italy	NULL	Torino
Mexico	NULL	México D.F.
Norway	NULL	Stavern
Poland	NULL	Warszawa
Portugal	NULL	Lisboa
Spain	NULL	Barcelona

Spain	NULL	Madrid
Spain	NULL	Sevilla
Sweden	NULL	Bräcke
Sweden	NULL	Luleå
Switzerland	NULL	Bern
Switzerland	NULL	Genève
UK	NULL	London
UK	Isle of Wight	Cowes
USA	AK	Anchorage
USA	CA	San Francisco
USA	ID	Boise
USA	MT	Butte
USA	NM	Albuquerque
USA	OR	Elgin
USA	OR	Eugene
USA	OR	Portland
USA	WA	Kirkland
USA	WA	Redmond
USA	WA	Seattle
USA	WA	Tacoma
USA	WA	Walla Walla
USA	WY	Lander
Venezuela	DF	Caracas
Venezuela	Lara	Barquisimeto
Venezuela	Nueva Esparta	I. de Margarita
Venezuela	Táchira	San Cristóbal

2. Operador EXCEPT y INTERSECT

2.1. El operador INTERSECT retorna solo las filas encontradas en ambas tablas

In [5]:

```
SELECT country, region, city FROM HR.Employees
INTERSECT -- 3 distinct rows
SELECT country, region, city FROM Sales.Customers;
```

(3 rows affected)

Total execution time: 00:00:00.020

Out[5]:

country	region	city
UK	NULL	London
USA	WA	Kirkland
USA	WA	Seattle

2.2. El operador EXCEPT retorna solo las filas de la tabla tabla derecha (HR.Employees) que no se intersectan con la tabla izquierda.

```
SELECT country, region, city FROM HR.Employees
EXCEPT
SELECT country, region, city FROM Sales.Customers;
```

(2 rows affected)

Total execution time: 00:00:00.577

Out[6]:

country	region	city
USA	WA	Redmond
USA	WA	Tacoma

2.3. El operador EXCEPT retorna solo las filas de la tabla tabla derecha (Sales.Custormers) que no se intersectan con la tabla izquierda.

In [7]:

```
SELECT country, region, city FROM Sales.Customers
EXCEPT
SELECT country, region, city FROM HR.Employees;
```

(66 rows affected)

Total execution time: 00:00:00.018

Out[7]:

country	region	city
Argentina	NULL	Buenos Aires
Austria	NULL	Graz
Austria	NULL	Salzburg
Belgium	NULL	Bruxelles
Belgium	NULL	Charleroi
Brazil	RJ	Rio de Janeiro
Brazil	SP	Campinas
Brazil	SP	Resende
Brazil	SP	Sao Paulo
Canada	BC	Tsawassen
Canada	BC	Vancouver
Canada	Québec	Montréal
Denmark	NULL	Århus
Denmark	NULL	Kobenhavn
Finland	NULL	Helsinki
Finland	NULL	Oulu
France	NULL	Lille
France	NULL	Lyon
France	NULL	Marseille
France	NULL	Nantes
France	NULL	Paris
France	NULL	Reims
France	NULL	Strasbourg
France	NULL	Toulouse

France	NULL	Versailles
Germany	NULL	Aachen
Germany	NULL	Berlin
Germany	NULL	Brandenburg
Germany	NULL	Cunewalde
Germany	NULL	Frankfurt a.M.
Germany	NULL	Köln
Germany	NULL	Leipzig
Germany	NULL	Mannheim
Germany	NULL	München
Germany	NULL	Münster
Germany	NULL	Stuttgart
Ireland	Co. Cork	Cork
Italy	NULL	Bergamo
Italy	NULL	Reggio Emilia
Italy	NULL	Torino
Mexico	NULL	México D.F.
Norway	NULL	Stavern
Poland	NULL	Warszawa
Portugal	NULL	Lisboa
Spain	NULL	Barcelona
Spain	NULL	Madrid
Spain	NULL	Sevilla
Sweden	NULL	Bräcke
Sweden	NULL	Luleå
Switzerland	NULL	Bern
Switzerland	NULL	Genève
UK	Isle of Wight	Cowes
USA	AK	Anchorage
USA	CA	San Francisco
USA	ID	Boise
USA	MT	Butte
USA	NM	Albuquerque
USA	OR	Elgin
USA	OR	Eugene
USA	OR	Portland
USA	WA	Walla Walla
USA	WY	Lander
Venezuela	DF	Caracas
Venezuela	Lara	Barquisimeto
Venezuela	Nueva Esparta	I. de Margarita
Venezuela	Táchira	San Cristóbal

3. Utilizando el Operador APPLY

3.1. Crear una función de tabla que acepte una variable SupplierID y retorne el top 3 de los productos más costosos de ese proveedor

In [8]:

```sql
CREATE FUNCTION dbo.fn_TopProductsByShipper
(@supplierid int)
RETURNS TABLE
AS
RETURN
 SELECT TOP (3) productid, productname, unitprice
 FROM Production.Products
 WHERE supplierid = @supplierid
 ORDER BY unitprice DESC;
GO
```

Commands completed successfully.

Total execution time: 00:00:00.049

3.2. Probar la función con el proveedor ID=2

In [9]:

```sql
SELECT * FROM dbo.fn_TopProductsByShipper(2);
```

(3 rows affected)

Total execution time: 00:00:00.089

Out[9]:

productid	productname	unitprice
4	Product KSBRM	22,0000
5	Product EPEIM	21,3500
65	Product XYWBZ	21,0500

3.3. Probar con el operador CROSS APPLY

In [10]:

```sql
SELECT S.supplierid, S.companyname,
 P.productid, P.productname, P.unitprice
FROM Production.Suppliers AS S
CROSS APPLY dbo.fn_TopProductsByShipper(S.supplierid) AS P
ORDER BY S.supplierid ASC, P.unitprice DESC;
```

(71 rows affected)

Total execution time: 00:00:00.046

Out[10]:

supplierid	companyname	productid	productname	unitprice
1	Supplier SWRXU	2	Product RECZE	19,0000
1	Supplier SWRXU	1	Product HHYDP	18,0000
1	Supplier SWRXU	3	Product IMEHJ	10,0000
2	Supplier VHQZD	4	Product KSBRM	22,0000
2	Supplier VHQZD	5	Product EPEIM	21,3500
2	Supplier VHQZD	65	Product XYWBZ	21,0500
3	Supplier STUAZ	8	Product WVJFP	40,0000
3	Supplier STUAZ	7	Product HMLNI	30,0000

3	Supplier STOAZ	6	Product VAHV	25,0000
4	Supplier QOVFD	9	Product AOZBW	97,0000
4	Supplier QOVFD	10	Product YHXGE	31,0000
4	Supplier QOVFD	74	Product BKAZJ	10,0000
5	Supplier EQPNC	12	Product OSFNS	38,0000
5	Supplier EQPNC	11	Product QMVUN	21,0000
6	Supplier QWUSF	14	Product PWCJB	23,2500
6	Supplier QWUSF	15	Product KSZOI	15,5000
6	Supplier QWUSF	13	Product POXFU	6,0000
7	Supplier GQRCV	18	Product CKEDC	62,5000
7	Supplier GQRCV	63	Product ICKNK	43,9000
7	Supplier GQRCV	17	Product BLCAX	39,0000
8	Supplier BWGYE	20	Product QHFFP	81,0000
8	Supplier BWGYE	68	Product TBTBL	12,5000
8	Supplier BWGYE	21	Product VJZZH	10,0000
9	Supplier QQYEU	22	Product CPHFY	21,0000
9	Supplier QQYEU	23	Product JLUDZ	9,0000
10	Supplier UNAHG	24	Product QOGNU	4,5000
11	Supplier ZPYVS	27	Product SMIOH	43,9000
11	Supplier ZPYVS	26	Product HLGZA	31,2300
11	Supplier ZPYVS	25	Product LYLNI	14,0000
12	Supplier SVIYA	29	Product VJXYN	123,7900
12	Supplier SVIYA	28	Product OFBNT	45,6000
12	Supplier SVIYA	64	Product HCQDE	33,2500
13	Supplier TEGSC	30	Product LYERX	25,8900
14	Supplier KEREV	72	Product GEEOO	34,8000
14	Supplier KEREV	32	Product NUNAW	32,0000
14	Supplier KEREV	31	Product XWOXC	12,5000
15	Supplier NZLIF	69	Product COAXA	36,0000
15	Supplier NZLIF	71	Product MYMOI	21,5000
15	Supplier NZLIF	33	Product ASTMN	2,5000
16	Supplier UHZRG	35	Product NEVTJ	18,0000
16	Supplier UHZRG	67	Product XLXQF	14,0000
16	Supplier UHZRG	34	Product SWNJY	14,0000
17	Supplier QZGUF	37	Product EVFFA	26,0000
17	Supplier QZGUF	36	Product GMKIJ	19,0000
17	Supplier QZGUF	73	Product WEUJZ	15,0000
18	Supplier LVJUA	38	Product QDOMO	263,5000
18	Supplier LVJUA	39	Product LSOFL	18,0000
19	Supplier JDNUG	40	Product YZIXQ	18,4000
19	Supplier JDNUG	41	Product TTEEX	9,6500
20	Supplier CIYNM	43	Product ZZZHR	46,0000
20	Supplier CIYNM	44	Product VJIEO	19,4500
20	Supplier CIYNM	42	Product RJVNM	14,0000
21	Supplier XOXZA	46	Product CBRRL	12,0000
21	Supplier XOXZA	45	Product AOOKB	9,5000

21	Supplier XOXZA	45	Product AQOKR	9,5000
22	Supplier FNUXM	48	Product MYNXN	12,7500
22	Supplier FNUXM	47	Product EZZPR	9,5000
23	Supplier ELCRN	49	Product FPYPN	20,0000
23	Supplier ELCRN	76	Product JYGFE	18,0000
23	Supplier ELCRN	50	Product BIUDV	16,2500
24	Supplier JNNES	51	Product APITJ	53,0000
24	Supplier JNNES	53	Product BKGEA	32,8000
24	Supplier JNNES	52	Product QSRXF	7,0000
25	Supplier ERVYZ	55	Product YYWRT	24,0000
25	Supplier ERVYZ	54	Product QAQRL	7,4500
26	Supplier ZWZDM	56	Product VKCMF	38,0000
26	Supplier ZWZDM	57	Product OVLQI	19,5000
27	Supplier ZRYDZ	58	Product ACRVI	13,2500
28	Supplier OAVQT	59	Product UKXRI	55,0000
28	Supplier OAVQT	60	Product WHBYK	34,0000
29	Supplier OGLRK	62	Product WUXYK	49,3000
29	Supplier OGLRK	61	Product XYZPE	28,5000

3.4. Escribir una consulta para buscar clientes sin ordenes generadas.

In [11]:

```
SELECT C.custid, C.companyname
FROM Sales.Customers AS C --91 customers
LEFT OUTER JOIN Sales.Orders AS O -- 830 orders
ON C.custid = O.custid --832 results with NULL cust
```

(832 rows affected)

Total execution time: 00:00:00.511

Out[11]:

custid	companyname
1	Customer NRZBB
1	Customer NRZBB
1	Customer NRZBB
1	Customer NRZBB
1	Customer NRZBB
1	Customer NRZBB
2	Customer MLTDN
2	Customer MLTDN
2	Customer MLTDN
2	Customer MLTDN
3	Customer KBUDE
3	Customer KBUDE
3	Customer KBUDE
3	Customer KBUDE
3	Customer KBUDE
3	Customer KBUDE
3	Customer KBUDE

3	Customer KBUDE
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
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4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
4	Customer HFBZG
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
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5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
5	Customer HGVLZ
6	Customer XHXJV
6	Customer XHXJV
6	Customer XHXJV
6	Customer XHXJV
6	Customer XHXJV
6	Customer XHXJV
6	Customer XHXJV
7	Customer QXVLA
7	Customer QXVLA
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7	Customer QXVLA
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7	Customer QXVLA
7	Customer QXVLA
8	Customer QUHWH
8	Customer QUHWH
8	Customer QUHWH
9	Customer RTXGC
9	Customer RTXGC
9	Customer RTXGC
9	Customer RTXGC
9	Customer RTXGC
9	Customer RTXGC
9	Customer RTXGC
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9	Customer RTXGC
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12	Customer PSNMQ
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12	Customer PSNMQ
12	Customer PSNMQ
12	Customer PSNMQ
13	Customer VMLOG
14	Customer WNMAF
14	Customer WNMAF
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14	Customer WNMAF
15	Customer JUWXK
15	Customer JUWXK
15	Customer JUWXK
15	Customer JUWXK
15	Customer JUWXK
16	Customer GYBBY
16	Customer GYBBY
16	Customer GYBBY
17	Customer FEVNN
17	Customer FEVNN
17	Customer FEVNN
17	Customer FEVNN
17	Customer FEVNN
17	Customer FEVNN
18	Customer BSVAR
18	Customer BSVAR
18	Customer BSVAR
18	Customer BSVAR
19	Customer RFNQC
19	Customer RFNQC
19	Customer RFNQC
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20	Customer THHDP

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20	**Customer THHDP**
21	**Customer KIDPX**
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21	**Customer KIDPX**
21	**Customer KIDPX**
21	**Customer KIDPX**
21	**Customer KIDPX**
22	**Customer DTDMN**
23	**Customer WVFAF**
23	**Customer WVFAF**
23	**Customer WVFAF**
23	**Customer WVFAF**
23	**Customer WVFAF**
24	**Customer CYZTN**
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24	Customer CYZTN
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
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25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
25	Customer AZJED
26	Customer USDBG
26	Customer USDBG
26	Customer USDBG
27	Customer WMFEA
27	Customer WMFEA
27	Customer WMFEA
27	Customer WMFEA
27	Customer WMFEA
27	Customer WMFEA
28	Customer XYUFB
28	Customer XYUFB
28	Customer XYUFB
28	Customer XYUFB
28	Customer XYUFB

28	Customer XYUFB
28	Customer XYUFB
28	Customer XYUFB
28	Customer XYUFB
29	Customer MDLWA
29	Customer MDLWA
29	Customer MDLWA
29	Customer MDLWA
29	Customer MDLWA
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
30	Customer KSLQF
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
31	Customer YJCBX
32	Customer YSIQX
32	Customer YSIQX
32	Customer YSIQX
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32	Customer YSIQX
32	Customer YSIQX
32	Customer YSIQX
32	Customer YSIQX
32	Customer YSIQX
32	Customer YSIQX
33	Customer FVXPQ
33	Customer FVXPQ
34	Customer IBVRG
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35	Customer UMTLM
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35	Customer UMTLM
35	Customer UMTLM
35	Customer UMTLM
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36	Customer LVJSO
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36	Customer LVJSO
36	Customer LVJSO
37	Customer FRXZL
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37	Customer FRXZL
38	Customer LJUCA
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38	Customer LJUCA
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38	Customer LJUCA
38	Customer LJUCA
38	Customer LJUCA
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3.5. Retornar los tres productos más recientemente ordenados por cliente, Utilizando CROSS APPLY

In [12]:

```sql
SELECT C.custid, TopOrders.orderid, TopOrders.orderdate
FROM Sales.Customers AS C
CROSS APPLY
(SELECT TOP (3) orderid, orderdate
 FROM Sales.Orders AS O
 WHERE O.custid = C.custid
 ORDER BY orderdate DESC, orderid DESC) AS TopOrders;
```

(263 rows affected)

Total execution time: 00:00:00.056

Out[12]:

custid	orderid	orderdate
1	11011	2008-04-09 00:00:00.000
1	10952	2008-03-16 00:00:00.000
1	10835	2008-01-15 00:00:00.000
2	10926	2008-03-04 00:00:00.000
2	10759	2007-11-28 00:00:00.000
2	10625	2007-08-08 00:00:00.000
3	10856	2008-01-28 00:00:00.000
3	10682	2007-09-25 00:00:00.000
3	10677	2007-09-22 00:00:00.000
4	11016	2008-04-10 00:00:00.000
4	10953	2008-03-16 00:00:00.000
4	10920	2008-03-03 00:00:00.000
5	10924	2008-03-04 00:00:00.000
5	10875	2008-02-06 00:00:00.000
5	10866	2008-02-03 00:00:00.000
6	11058	2008-04-29 00:00:00.000
6	10956	2008-03-17 00:00:00.000
6	10853	2008-01-27 00:00:00.000
7	10826	2008-01-12 00:00:00.000
7	10679	2007-09-23 00:00:00.000
7	10628	2007-08-12 00:00:00.000
8	10970	2008-03-24 00:00:00.000
8	10801	2007-12-29 00:00:00.000
8	10326	2006-10-10 00:00:00.000
9	11076	2008-05-06 00:00:00.000
9	10940	2008-03-11 00:00:00.000
9	10932	2008-03-06 00:00:00.000

11	11023	2008-04-14 00:00:00.000
11	10947	2008-03-13 00:00:00.000
11	10943	2008-03-11 00:00:00.000
12	11054	2008-04-28 00:00:00.000
12	10937	2008-03-10 00:00:00.000
12	10881	2008-02-11 00:00:00.000
13	10259	2006-07-18 00:00:00.000
14	11041	2008-04-22 00:00:00.000
14	11029	2008-04-16 00:00:00.000
14	10966	2008-03-20 00:00:00.000
16	10848	2008-01-23 00:00:00.000
16	10462	2007-03-03 00:00:00.000
16	10435	2007-02-04 00:00:00.000
17	11067	2008-05-04 00:00:00.000
17	11036	2008-04-20 00:00:00.000
17	10825	2008-01-09 00:00:00.000
18	10890	2008-02-16 00:00:00.000
18	10683	2007-09-26 00:00:00.000
18	10609	2007-07-24 00:00:00.000
19	11056	2008-04-28 00:00:00.000
19	11047	2008-04-24 00:00:00.000
19	11024	2008-04-15 00:00:00.000
20	11072	2008-05-05 00:00:00.000
20	11017	2008-04-13 00:00:00.000
20	11008	2008-04-08 00:00:00.000
23	10789	2007-12-22 00:00:00.000
23	10763	2007-12-03 00:00:00.000
23	10634	2007-08-15 00:00:00.000
24	11050	2008-04-27 00:00:00.000
24	11001	2008-04-06 00:00:00.000
24	10993	2008-04-01 00:00:00.000
25	11012	2008-04-09 00:00:00.000
25	10929	2008-03-05 00:00:00.000
25	10859	2008-01-29 00:00:00.000
26	10971	2008-03-24 00:00:00.000
26	10860	2008-01-29 00:00:00.000
26	10671	2007-09-17 00:00:00.000
27	11060	2008-04-30 00:00:00.000
27	11026	2008-04-15 00:00:00.000
27	10807	2007-12-31 00:00:00.000
28	10963	2008-03-19 00:00:00.000
28	10664	2007-09-10 00:00:00.000
28	10604	2007-07-18 00:00:00.000
29	10928	2008-03-05 00:00:00.000
29	10887	2008-02-13 00:00:00.000

29	10568	2007-06-13 00:00:00.000
30	11037	2008-04-21 00:00:00.000
30	11009	2008-04-08 00:00:00.000
30	10948	2008-03-13 00:00:00.000
39	11028	2008-04-16 00:00:00.000
39	10893	2008-02-18 00:00:00.000
39	10849	2008-01-23 00:00:00.000
40	10973	2008-03-24 00:00:00.000
40	10972	2008-03-24 00:00:00.000
40	10927	2008-03-05 00:00:00.000
41	11051	2008-04-27 00:00:00.000
41	10923	2008-03-03 00:00:00.000
41	10832	2008-01-14 00:00:00.000
44	11070	2008-05-05 00:00:00.000
44	10934	2008-03-09 00:00:00.000
44	10891	2008-02-17 00:00:00.000
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49	10939	2008-03-10 00:00:00.000
49	10818	2008-01-07 00:00:00.000
50	11004	2008-04-07 00:00:00.000
50	10978	2008-03-26 00:00:00.000
50	10896	2008-02-19 00:00:00.000
52	10945	2008-03-12 00:00:00.000
52	10779	2007-12-16 00:00:00.000
52	10699	2007-10-09 00:00:00.000
53	11057	2008-04-29 00:00:00.000
53	10752	2007-11-24 00:00:00.000
53	10517	2007-04-24 00:00:00.000
54	10986	2008-03-30 00:00:00.000
54	10958	2008-03-18 00:00:00.000
54	10898	2008-02-20 00:00:00.000
56	11020	2008-04-14 00:00:00.000
56	10999	2008-04-03 00:00:00.000
56	10833	2008-01-15 00:00:00.000
58	11073	2008-05-05 00:00:00.000
58	10995	2008-04-02 00:00:00.000
58	10502	2007-04-10 00:00:00.000
59	11053	2008-04-27 00:00:00.000
59	10844	2008-01-21 00:00:00.000
59	10747	2007-11-19 00:00:00.000
60	11007	2008-04-08 00:00:00.000
60	10477	2007-03-17 00:00:00.000
60	10433	2007-02-03 00:00:00.000
63	11021	2008-04-14 00:00:00.000
63	10996	2008-04-02 00:00:00.000

63	10991	2008-04-01 00:00:00.000
64	11019	2008-04-13 00:00:00.000
64	10916	2008-02-27 00:00:00.000
64	10828	2008-01-13 00:00:00.000
66	11062	2008-04-30 00:00:00.000
66	11010	2008-04-09 00:00:00.000
66	10942	2008-03-11 00:00:00.000
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68	10951	2008-03-16 00:00:00.000
69	11013	2008-04-09 00:00:00.000
69	10917	2008-03-02 00:00:00.000
69	10306	2006-09-16 00:00:00.000
70	11015	2008-04-10 00:00:00.000
70	10909	2008-02-26 00:00:00.000
70	10831	2008-01-14 00:00:00.000
72	10869	2008-02-04 00:00:00.000
72	10804	2007-12-30 00:00:00.000
72	10800	2007-12-26 00:00:00.000
73	11074	2008-05-06 00:00:00.000
73	10802	2007-12-29 00:00:00.000
73	10669	2007-09-15 00:00:00.000
74	11043	2008-04-22 00:00:00.000
74	10964	2008-03-20 00:00:00.000
74	10907	2008-02-25 00:00:00.000
76	11038	2008-04-21 00:00:00.000
76	11035	2008-04-20 00:00:00.000
76	10930	2008-03-06 00:00:00.000
79	10967	2008-03-23 00:00:00.000
79	10608	2007-07-23 00:00:00.000
79	10548	2007-05-26 00:00:00.000
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80	10915	2008-02-27 00:00:00.000
80	10842	2008-01-20 00:00:00.000
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83	10946	2008-03-12 00:00:00.000
83	10921	2008-03-03 00:00:00.000
84	10850	2008-01-23 00:00:00.000
84	10843	2008-01-21 00:00:00.000
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90	10910	2008-02-26 00:00:00.000
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71	11030	2008-04-17 00:00:00.000
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46	11065	2008-05-01 00:00:00.000
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65	11000	2008-04-06 00:00:00.000
65	10988	2008-03-31 00:00:00.000
47	11039	2008-04-21 00:00:00.000
47	11014	2008-04-10 00:00:00.000
47	10954	2008-03-17 00:00:00.000

32	11061	2008-04-30 00:00:00.000
32	11040	2008-04-22 00:00:00.000
32	11006	2008-04-07 00:00:00.000
36	10660	2007-09-08 00:00:00.000
36	10600	2007-07-16 00:00:00.000
36	10415	2007-01-15 00:00:00.000
48	11018	2008-04-13 00:00:00.000
48	10883	2008-02-12 00:00:00.000
48	10867	2008-02-03 00:00:00.000
77	10992	2008-04-01 00:00:00.000
77	10805	2007-12-30 00:00:00.000
77	10708	2007-10-17 00:00:00.000
51	10724	2007-10-30 00:00:00.000
51	10619	2007-08-04 00:00:00.000
51	10618	2007-08-01 00:00:00.000
34	11052	2008-04-27 00:00:00.000
34	11022	2008-04-14 00:00:00.000
34	10981	2008-03-27 00:00:00.000
61	10989	2008-03-31 00:00:00.000
61	10794	2007-12-24 00:00:00.000
61	10720	2007-10-28 00:00:00.000
67	11059	2008-04-29 00:00:00.000
67	10877	2008-02-09 00:00:00.000
67	10851	2008-01-26 00:00:00.000
15	11042	2008-04-22 00:00:00.000
15	10969	2008-03-23 00:00:00.000
15	10494	2007-04-02 00:00:00.000
21	10725	2007-10-31 00:00:00.000
21	10650	2007-08-29 00:00:00.000
21	10581	2007-06-26 00:00:00.000
31	11049	2008-04-24 00:00:00.000
31	10959	2008-03-18 00:00:00.000
31	10790	2007-12-22 00:00:00.000
62	11068	2008-05-04 00:00:00.000
62	10961	2008-03-19 00:00:00.000
62	10914	2008-02-27 00:00:00.000
81	10839	2008-01-19 00:00:00.000
81	10834	2008-01-15 00:00:00.000
81	10830	2008-01-13 00:00:00.000
88	10935	2008-03-09 00:00:00.000
88	10905	2008-02-24 00:00:00.000
88	10900	2008-02-20 00:00:00.000
35	11055	2008-04-28 00:00:00.000
35	10976	2008-03-25 00:00:00.000
35	10960	2008-03-19 00:00:00.000

43	10545	2007-05-22 00:00:00.000
43	10482	2007-03-21 00:00:00.000
82	10822	2008-01-08 00:00:00.000
82	10577	2007-06-23 00:00:00.000
82	10574	2007-06-19 00:00:00.000
89	11066	2008-05-01 00:00:00.000
89	11032	2008-04-17 00:00:00.000
89	10904	2008-02-24 00:00:00.000
75	10974	2008-03-25 00:00:00.000
75	10821	2008-01-08 00:00:00.000
75	10756	2007-11-27 00:00:00.000

3.6. Utilizar OUTER APPLY para incluir a los clientes sin ordenes

In [13]:

```sql
SELECT C.custid, TopOrders.orderid, TopOrders.orderdate
FROM Sales.Customers AS C
OUTER APPLY
(SELECT TOP (3) orderid, orderdate
 FROM Sales.Orders AS O
 WHERE O.custid = C.custid
 ORDER BY orderdate DESC, orderid DESC) AS TopOrders;
```

(265 rows affected)

Total execution time: 00:00:00.035

Out[13]:

custid	orderid	orderdate
1	11011	2008-04-09 00:00:00.000
1	10952	2008-03-16 00:00:00.000
1	10835	2008-01-15 00:00:00.000
2	10926	2008-03-04 00:00:00.000
2	10759	2007-11-28 00:00:00.000
2	10625	2007-08-08 00:00:00.000
3	10856	2008-01-28 00:00:00.000
3	10682	2007-09-25 00:00:00.000
3	10677	2007-09-22 00:00:00.000
4	11016	2008-04-10 00:00:00.000
4	10953	2008-03-16 00:00:00.000
4	10920	2008-03-03 00:00:00.000
5	10924	2008-03-04 00:00:00.000
5	10875	2008-02-06 00:00:00.000
5	10866	2008-02-03 00:00:00.000
6	11058	2008-04-29 00:00:00.000
6	10956	2008-03-17 00:00:00.000
6	10853	2008-01-27 00:00:00.000
7	10826	2008-01-12 00:00:00.000
7	10679	2007-09-23 00:00:00.000
7	10628	2007-08-12 00:00:00.000

8	10970	2008-03-24 00:00:00.000
8	10801	2007-12-29 00:00:00.000
8	10326	2006-10-10 00:00:00.000
9	11076	2008-05-06 00:00:00.000
9	10940	2008-03-11 00:00:00.000
9	10932	2008-03-06 00:00:00.000
11	11023	2008-04-14 00:00:00.000
11	10947	2008-03-13 00:00:00.000
11	10943	2008-03-11 00:00:00.000
12	11054	2008-04-28 00:00:00.000
12	10937	2008-03-10 00:00:00.000
12	10881	2008-02-11 00:00:00.000
13	10259	2006-07-18 00:00:00.000
14	11041	2008-04-22 00:00:00.000
14	11029	2008-04-16 00:00:00.000
14	10966	2008-03-20 00:00:00.000
16	10848	2008-01-23 00:00:00.000
16	10462	2007-03-03 00:00:00.000
16	10435	2007-02-04 00:00:00.000
17	11067	2008-05-04 00:00:00.000
17	11036	2008-04-20 00:00:00.000
17	10825	2008-01-09 00:00:00.000
18	10890	2008-02-16 00:00:00.000
18	10683	2007-09-26 00:00:00.000
18	10609	2007-07-24 00:00:00.000
19	11056	2008-04-28 00:00:00.000
19	11047	2008-04-24 00:00:00.000
19	11024	2008-04-15 00:00:00.000
20	11072	2008-05-05 00:00:00.000
20	11017	2008-04-13 00:00:00.000
20	11008	2008-04-08 00:00:00.000
22	NULL	NULL
23	10789	2007-12-22 00:00:00.000
23	10763	2007-12-03 00:00:00.000
23	10634	2007-08-15 00:00:00.000
24	11050	2008-04-27 00:00:00.000
24	11001	2008-04-06 00:00:00.000
24	10993	2008-04-01 00:00:00.000
25	11012	2008-04-09 00:00:00.000
25	10929	2008-03-05 00:00:00.000
25	10859	2008-01-29 00:00:00.000
26	10971	2008-03-24 00:00:00.000
26	10860	2008-01-29 00:00:00.000
26	10671	2007-09-17 00:00:00.000
27	11060	2008-04-30 00:00:00.000

27	11026	2008-04-15 00:00:00.000
27	10807	2007-12-31 00:00:00.000
28	10963	2008-03-19 00:00:00.000
28	10664	2007-09-10 00:00:00.000
28	10604	2007-07-18 00:00:00.000
29	10928	2008-03-05 00:00:00.000
29	10887	2008-02-13 00:00:00.000
29	10568	2007-06-13 00:00:00.000
30	11037	2008-04-21 00:00:00.000
30	11009	2008-04-08 00:00:00.000
30	10948	2008-03-13 00:00:00.000
39	11028	2008-04-16 00:00:00.000
39	10893	2008-02-18 00:00:00.000
39	10849	2008-01-23 00:00:00.000
40	10973	2008-03-24 00:00:00.000
40	10972	2008-03-24 00:00:00.000
40	10927	2008-03-05 00:00:00.000
41	11051	2008-04-27 00:00:00.000
41	10923	2008-03-03 00:00:00.000
41	10832	2008-01-14 00:00:00.000
44	11070	2008-05-05 00:00:00.000
44	10934	2008-03-09 00:00:00.000
44	10891	2008-02-17 00:00:00.000
49	10950	2008-03-16 00:00:00.000
49	10939	2008-03-10 00:00:00.000
49	10818	2008-01-07 00:00:00.000
50	11004	2008-04-07 00:00:00.000
50	10978	2008-03-26 00:00:00.000
50	10896	2008-02-19 00:00:00.000
52	10945	2008-03-12 00:00:00.000
52	10779	2007-12-16 00:00:00.000
52	10699	2007-10-09 00:00:00.000
53	11057	2008-04-29 00:00:00.000
53	10752	2007-11-24 00:00:00.000
53	10517	2007-04-24 00:00:00.000
54	10986	2008-03-30 00:00:00.000
54	10958	2008-03-18 00:00:00.000
54	10898	2008-02-20 00:00:00.000
56	11020	2008-04-14 00:00:00.000
56	10999	2008-04-03 00:00:00.000
56	10833	2008-01-15 00:00:00.000
57	NULL	NULL
58	11073	2008-05-05 00:00:00.000
58	10995	2008-04-02 00:00:00.000
58	10502	2007-04-10 00:00:00.000

59	11053	2008-04-27 00:00:00.000
59	10844	2008-01-21 00:00:00.000
59	10747	2007-11-19 00:00:00.000
60	11007	2008-04-08 00:00:00.000
60	10477	2007-03-17 00:00:00.000
60	10433	2007-02-03 00:00:00.000
63	11021	2008-04-14 00:00:00.000
63	10996	2008-04-02 00:00:00.000
63	10991	2008-04-01 00:00:00.000
64	11019	2008-04-13 00:00:00.000
64	10916	2008-02-27 00:00:00.000
64	10828	2008-01-13 00:00:00.000
66	11062	2008-04-30 00:00:00.000
66	11010	2008-04-09 00:00:00.000
66	10942	2008-03-11 00:00:00.000
68	11075	2008-05-06 00:00:00.000
68	11033	2008-04-17 00:00:00.000
68	10951	2008-03-16 00:00:00.000
69	11013	2008-04-09 00:00:00.000
69	10917	2008-03-02 00:00:00.000
69	10306	2006-09-16 00:00:00.000
70	11015	2008-04-10 00:00:00.000
70	10909	2008-02-26 00:00:00.000
70	10831	2008-01-14 00:00:00.000
72	10869	2008-02-04 00:00:00.000
72	10804	2007-12-30 00:00:00.000
72	10800	2007-12-26 00:00:00.000
73	11074	2008-05-06 00:00:00.000
73	10802	2007-12-29 00:00:00.000
73	10669	2007-09-15 00:00:00.000
74	11043	2008-04-22 00:00:00.000
74	10964	2008-03-20 00:00:00.000
74	10907	2008-02-25 00:00:00.000
76	11038	2008-04-21 00:00:00.000
76	11035	2008-04-20 00:00:00.000
76	10930	2008-03-06 00:00:00.000
79	10967	2008-03-23 00:00:00.000
79	10608	2007-07-23 00:00:00.000
79	10548	2007-05-26 00:00:00.000
80	11069	2008-05-04 00:00:00.000
80	10915	2008-02-27 00:00:00.000
80	10842	2008-01-20 00:00:00.000
83	10994	2008-04-02 00:00:00.000
83	10946	2008-03-12 00:00:00.000
83	10921	2008-03-03 00:00:00.000

84	10850	2008-01-23 00:00:00.000
84	10843	2008-01-21 00:00:00.000
84	10814	2008-01-05 00:00:00.000
85	10739	2007-11-12 00:00:00.000
85	10737	2007-11-11 00:00:00.000
85	10295	2006-09-02 00:00:00.000
86	11046	2008-04-23 00:00:00.000
86	10668	2007-09-15 00:00:00.000
86	10651	2007-09-01 00:00:00.000
87	11025	2008-04-15 00:00:00.000
87	10781	2007-12-17 00:00:00.000
87	10750	2007-11-21 00:00:00.000
90	11005	2008-04-07 00:00:00.000
90	10910	2008-02-26 00:00:00.000
90	10879	2008-02-10 00:00:00.000
91	11044	2008-04-23 00:00:00.000
91	10998	2008-04-03 00:00:00.000
91	10906	2008-02-25 00:00:00.000
55	11034	2008-04-20 00:00:00.000
55	10965	2008-03-20 00:00:00.000
55	10855	2008-01-27 00:00:00.000
10	11048	2008-04-24 00:00:00.000
10	11045	2008-04-23 00:00:00.000
10	11027	2008-04-16 00:00:00.000
42	10810	2008-01-01 00:00:00.000
42	10620	2007-08-05 00:00:00.000
42	10495	2007-04-03 00:00:00.000
45	10884	2008-02-12 00:00:00.000
45	10735	2007-11-10 00:00:00.000
45	10719	2007-10-27 00:00:00.000
37	11063	2008-04-30 00:00:00.000
37	10985	2008-03-30 00:00:00.000
37	10912	2008-02-26 00:00:00.000
33	10785	2007-12-18 00:00:00.000
33	10268	2006-07-30 00:00:00.000
71	11064	2008-05-01 00:00:00.000
71	11031	2008-04-17 00:00:00.000
71	11030	2008-04-17 00:00:00.000
38	10933	2008-03-06 00:00:00.000
38	10829	2008-01-13 00:00:00.000
38	10798	2007-12-26 00:00:00.000
46	11071	2008-05-05 00:00:00.000
46	11065	2008-05-01 00:00:00.000
46	10997	2008-04-03 00:00:00.000
78	11003	2008-04-06 00:00:00.000

78	10775	2007-12-12 00:00:00.000
78	10624	2007-08-07 00:00:00.000
65	11077	2008-05-06 00:00:00.000
65	11000	2008-04-06 00:00:00.000
65	10988	2008-03-31 00:00:00.000
47	11039	2008-04-21 00:00:00.000
47	11014	2008-04-10 00:00:00.000
47	10954	2008-03-17 00:00:00.000
32	11061	2008-04-30 00:00:00.000
32	11040	2008-04-22 00:00:00.000
32	11006	2008-04-07 00:00:00.000
36	10660	2007-09-08 00:00:00.000
36	10600	2007-07-16 00:00:00.000
36	10415	2007-01-15 00:00:00.000
48	11018	2008-04-13 00:00:00.000
48	10883	2008-02-12 00:00:00.000
48	10867	2008-02-03 00:00:00.000
77	10992	2008-04-01 00:00:00.000
77	10805	2007-12-30 00:00:00.000
77	10708	2007-10-17 00:00:00.000
51	10724	2007-10-30 00:00:00.000
51	10619	2007-08-04 00:00:00.000
51	10618	2007-08-01 00:00:00.000
34	11052	2008-04-27 00:00:00.000
34	11022	2008-04-14 00:00:00.000
34	10981	2008-03-27 00:00:00.000
61	10989	2008-03-31 00:00:00.000
61	10794	2007-12-24 00:00:00.000
61	10720	2007-10-28 00:00:00.000
67	11059	2008-04-29 00:00:00.000
67	10877	2008-02-09 00:00:00.000
67	10851	2008-01-26 00:00:00.000
15	11042	2008-04-22 00:00:00.000
15	10969	2008-03-23 00:00:00.000
15	10494	2007-04-02 00:00:00.000
21	10725	2007-10-31 00:00:00.000
21	10650	2007-08-29 00:00:00.000
21	10581	2007-06-26 00:00:00.000
31	11049	2008-04-24 00:00:00.000
31	10959	2008-03-18 00:00:00.000
31	10790	2007-12-22 00:00:00.000
62	11068	2008-05-04 00:00:00.000
62	10961	2008-03-19 00:00:00.000
62	10914	2008-02-27 00:00:00.000
81	10839	2008-01-19 00:00:00.000

81	10834	2008-01-15 00:00:00.000
81	10830	2008-01-13 00:00:00.000
88	10935	2008-03-09 00:00:00.000
88	10905	2008-02-24 00:00:00.000
88	10900	2008-02-20 00:00:00.000
35	11055	2008-04-28 00:00:00.000
35	10976	2008-03-25 00:00:00.000
35	10960	2008-03-19 00:00:00.000
43	10545	2007-05-22 00:00:00.000
43	10482	2007-03-21 00:00:00.000
82	10822	2008-01-08 00:00:00.000
82	10577	2007-06-23 00:00:00.000
82	10574	2007-06-19 00:00:00.000
89	11066	2008-05-01 00:00:00.000
89	11032	2008-04-17 00:00:00.000
89	10904	2008-02-24 00:00:00.000
75	10974	2008-03-25 00:00:00.000
75	10821	2008-01-08 00:00:00.000
75	10756	2007-11-27 00:00:00.000