

Database Design Project

Oracle Baseball League Store Database

Project Scenario:

You are a small consulting company specializing in database development. You have just been awarded the contract to develop a data model for a database application system for a small retail store called Oracle Baseball League (OBL).

The Oracle Baseball League store serves the entire surrounding community selling baseball kit. The OBL has two types of customer, there are individuals who purchase items like balls, cleats, gloves, shirts, screen printed t-shirts, and shorts. Additionally customers can represent a team when they purchase uniforms and equipment on behalf of the team.

Teams and individual customers are free to purchase any item from the inventory list, but teams get a discount on the list price depending on the number of players. When a customer places an order we record the order items for that order in our database.

OBL has a team of three sales representatives that officially only call on teams but have been known to handle individual customer complaints.

Section 6 Lesson 9 Exercise 1: Joining Tables Using JOIN

Write SELECT Statements Using Data From Multiple Tables Using Equijoins and Non-Equijoins (S6L9 Objective 1)

In this exercise you will write SELECT statements to access data from more than one table.

Part 1: Creating Natural Joins.

1. Display all of the information about sales representatives and their addresses using a natural join.
2. Adapt the query from the previous question to only show the id, first name, last name, address line 1, address line 2, city, email and phone_number for the sales representatives.

Part 2: Creating Joins with the USING Clause

1. Adapt the previous query answer to use the USING clause instead of a natural join.
2. Display all of the information about items and their price history by joining the items and price_history tables.

Part 3: Creating Joins with the ON Clause

1. Use an ON clause to join the customer and sales representative table so that you display the customer number, customer first name, customer last name, customer phone number, customer email, sales representative id, sales representative first name, sales representative last name and sales representative email. You will need to use a table alias in your answer as both tables have columns with the same name.

Part 4- Creating Three-Way Joins with the ON Clause

1. Using the answer to Task 3 add a join that will allow the team name that the customer represents to be included in the results.

Part 5: Applying Additional Conditions to a Join

1. Using the answer to Task 4 add an additional condition to only show the results for the customer that has the number - c00001.

Part 6: Retrieving Records with Nonequijoins

1. Write a query that will display name and cost of the item with the number im01101045 on the 12th of December 2016. The output of the query should look like this:

The cost of the under shirt on this day was 14.99

Part 1

1. `select * from sales_representatives natural join sales_rep_addresses;`

The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar lists 'HR' and 'System'. The 'Reports' sidebar lists various report types. The 'Files' sidebar shows recent files including 'mywork/SEC02523-02'. The 'Worksheet' tab contains the query: `--part 1
select * from sales_representatives natural join sales_rep_addresses;`. The 'Query Result' tab displays the results:

ID	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	COMMISSION_RATE	SUPERVISOR_ID	ADDRESS_LINE_1	ADDRESS_LINE_2	CITY	ZIP_CODE
1	charay@obl.com	Charles	Raymond	0134598761	10	sr01	12 Cherry Lane	Denton	Detroit	DT48211
2	vwright@obl.com	Victoria	Wright	0134598762	5	sr01	87 Blossom Hill	Uptown	Detroit	DT52314
3	bspeed@obl.com	Barry	Speed	0134598763	5	sr01	12 Junction Row	Skinflats	Detroit	DT52564

2. `select id, first_name, last_name, address_line_1, address_line_2, city, email, phone_number`

`from sales_representatives natural join sales_rep_addresses;`

The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar lists 'HR' and 'System'. The 'Reports' sidebar lists various report types. The 'Files' sidebar shows recent files including 'mywork/SEC02523-02'. The 'Worksheet' tab contains the query: `--part 1
select * from sales_representatives natural join sales_rep_addresses;

select id, first_name, last_name, address_line_1, address_line_2, city, email,
phone_number from sales_representatives natural join sales_rep_addresses;`. The 'Query Result' tab displays the results:

ID	FIRST_NAME	LAST_NAME	ADDRESS_LINE_1	ADDRESS_LINE_2	CITY	EMAIL	PHONE_NUMBER
1	Charles	Raymond	12 Cherry Lane	Denton	Detroit	charay@obl.com	0134598761
2	Victoria	Wright	87 Blossom Hill	Uptown	Detroit	vwright@obl.com	0134598762
3	Barry	Speed	12 Junction Row	Skinflats	Detroit	bspeed@obl.com	0134598763

Part 2

1. `select id, first_name, last_name, address_line_1, address_line_2, city, email, phone_number
from sales_representatives join sales_rep_addresses
using (id);`

The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar shows an HR connection. The 'Reports' sidebar lists various report types. The 'Files' sidebar shows recent files and a folder structure including 'OS (C)', 'SAV_ASW', 'Recycle.Bin', and '#WinREAgent'. The 'SQL Worksheet' tab contains the following SQL code:

```
--part 1
--natural join sales_representatives natural join sales_rep_addresses;
select id, first_name, last_name, address_line_1, address_line_2, city, email,
phone_number from sales_representatives natural join sales_rep_addresses;

select id, first_name, last_name, address_line_1, address_line_2, city, email,
phone_number from sales_representatives join sales_rep_addresses
using (id);
```

The 'Query Result' pane displays the output of the query:

ID	FIRST_NAME	LAST_NAME	ADDRESS_LINE_1	ADDRESS_LINE_2	CITY	EMAIL	PHONE_NUMBER
1	sr01	Charles	Raymond	12 Cherry Lane Denton	Detroit	chray@obl.com	0134598761
2	sr02	Victoria	Wright	87 Blossom Hill Uptown	Detroit	vwright@obl.com	0134598762
3	sr03	Barry	Speed	12 Junction Row Skinflats	Detroit	bspeed@obl.com	0134598763

2. `select * from items join price_history
using (item_number);`

The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar shows an HR connection. The 'Reports' sidebar lists various report types. The 'Files' sidebar shows recent files and a folder structure including 'OS (C)', 'SAV_ASW', 'Recycle.Bin', and '#WinREAgent'. The 'SQL Worksheet' tab contains the following SQL code:

```
--part 1
--natural join sales_representatives natural join sales_rep_addresses;
select * from sales_representatives natural join sales_rep_addresses;

select id, first_name, last_name, address_line_1, address_line_2, city, email,
phone_number from sales_representatives natural join sales_rep_addresses;

select id, first_name, last_name, address_line_1, address_line_2, city, email,
phone_number from sales_representatives join sales_rep_addresses
using (id);

select * from items join price_history
using (item_number);
```

The 'Query Result' pane displays the output of the query:

ITEM_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	SIZE	ILT_ID	START_DATE	START_TIME	PRICE	END_DATE	END_TIME
1 im01101044	gloves	catcher mitt	clothing	brown	m	11010230124	17-JUN-17	17-JUN-16	4.99	(null)	(null)
2 im01101045	under shirt	top worn under the game top	clothing	white	s	11010230125	25-NOV-16	25-NOV-16	14.99	25-JAN-17	25-JAN-17
3 im01101045	under shirt	top worn under the game top	clothing	white	s	11010230125	25-JAN-17	25-JAN-17	8.99	25-JAN-17	25-JAN-17
4 im01101045	under shirt	top worn under the game top	clothing	white	s	11010230125	26-JAN-17	26-JAN-17	15.99	(null)	(null)
5 im01101046	socks	team socks with emblem	clothing	range	1	11010230126	12-FEB-17	12-FEB-17	7.99	(null)	(null)
6 im01101047	game top	team shirt with emblem	clothing	range	m	11010230127	25-APR-17	25-APR-17	24.99	(null)	(null)
7 im01101048	premium bat	high quality baseball bat	equipment	(null)	(null)	11010230128	31-MAY-17	31-MAY-17	14.99	0-NOV-23	08-NOV-23
8 im01101048	premium bat	high quality baseball bat	equipment	(null)	(null)	11010230128	08-NOV-23	08-NOV-23	99.99	(null)	(null)

Part 3

```
1. select c.cnt_number , c.first_name , c.last_name , c.phone_number , c.email , s.id , s.first_name , s.last_name , s.email  
from customers c join sales_representatives s  
on (c.cnt_id = s.id )
```

The screenshot shows the Oracle SQL Developer interface. The left sidebar contains connections to HR and System databases, reports, and files. The main area has four tabs at the top: DB_LAB1.sql, DB_LAB_2.sql, DB_LAB_3.sql, and DB_LAB_4.sql. The DB_LAB_3.sql tab is active, displaying the query from Part 3. Below the tabs is a toolbar with icons for Run, Stop, Refresh, and Save. The central workspace shows the query code and its execution results. The results are presented in a grid titled 'Query Result 1' with columns: CTR_NUMBER, FIRST_NAME, LAST_NAME, PHONE_NUMBER, EMAIL, ID, FIRST_NAME_1, and LAST_NAME_1. The data is as follows:

CTR_NUMBER	FIRST_NAME	LAST_NAME	PHONE_NUMBER	EMAIL	ID	FIRST_NAME_1	LAST_NAME_1
c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	s001	Charles	Raymond
c00101	John	Doe	03216547808	unknown@here.com	s001	Charles	Raymond
c01986	Maria	Galant	01442736589	margal87@delphiview.com	s103	Barry	Speed

Part 4

1. select ctr_number , c.first_name , c.last_name , c.phone_number , c.email , s.id , s.first_name , s.last_name , s.email , t.name
from customers c join sales_representatives s
on c.sre_id = s.id
join teams t
on c.tea_id = t.id ;

The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar lists 'HS' and 'System'. The 'Reports' sidebar lists 'All Reports', 'Analytic View Reports', 'Data Dictionary Reports', 'Data Modeler Reports', 'OLAP Reports', 'TimeTen Reports', and 'User Defined Reports'. The 'Files' sidebar shows recent files like 'My Computer', 'Desktop', 'Documents', 'My Documents', 'mywork', 'SECD2523-02', 'OS (C)', 'SAV_ASW', 'Recycle.Bin', and 'WinREAgent'. The main window has tabs for 'DB_LAB1.sql', 'DB_LAB 2.sql', 'DB_LAB_3.sql', and 'DB_LAB_4.sql'. The 'DB_LAB_4.sql' tab is active, displaying the query from Part 4. Below it is the 'Query Result' tab, which displays the following data:

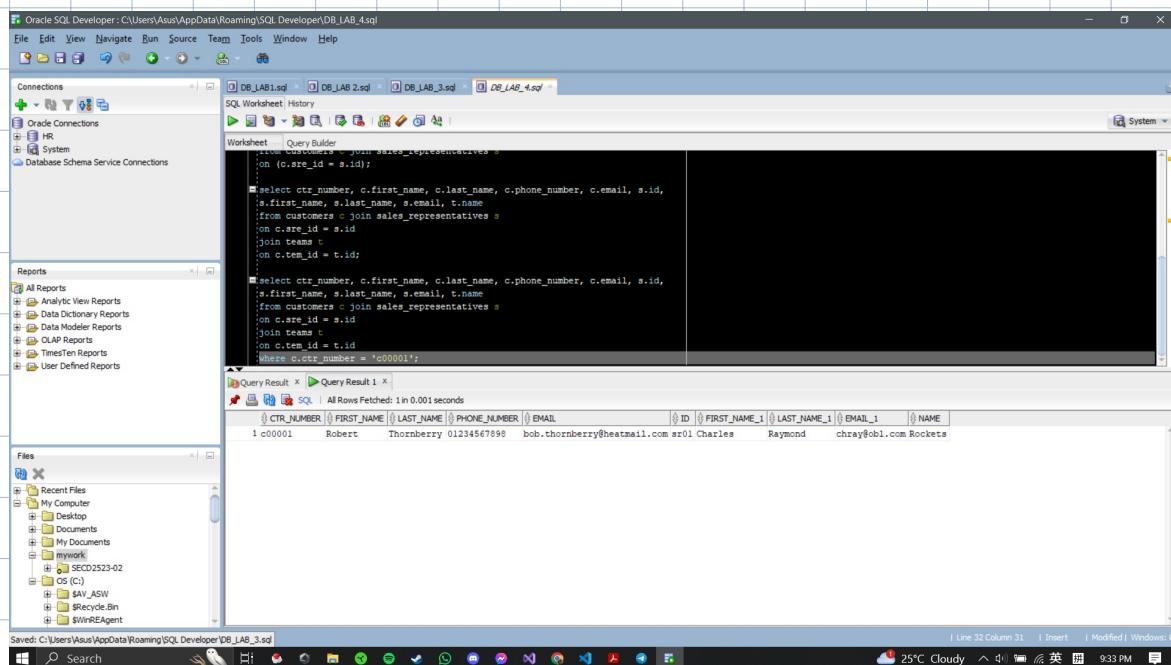
CTR_NUMBER	FIRST_NAME	LAST_NAME	PHONE_NUMBER	EMAIL	ID	FIRST_NAME_1	LAST_NAME_1	EMAIL_1	NAME
1 c00001	Robert	Thornberry	01234567899	bob.thornberry@heatmail.com	srl01	Charles	Raymond	chray@obl.com	Rockets
2 c00101	John	Doe	03216547800	unknown@here.com	srl01	Charles	Raymond	chray@obl.com	Celtics
3 c01986	Maria	Galant	01442736589	margal07@delphiview.com	srl03	Barry	Speed	bspeed@obl.com	Rovers

Part 5

1. select ctr_number, c.first_name, c.last_name, c.phone_number, c.email, s.id, s.first_name, s.last_name, s.email, t.name
from customers c join sales_representatives s
on c.cre_id = s.id

join teams t
on c.tem_id = t.id

where c.ctr_number = 'c00001';



The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar lists 'HR' and 'System'. The 'Reports' sidebar lists various report types. The 'Files' sidebar shows a folder structure with 'Recent Files', 'My Computer', 'Desktop', 'Documents', 'mywork', and 'OS (C)'. The central 'Worksheet' tab contains the SQL query from above. The 'Query Result' tab shows the output:

CTR_NUMBER	FIRST_NAME	LAST_NAME	PHONE_NUMBER	EMAIL	ID	FIRST_NAME_1	LAST_NAME_1	EMAIL_1	NAME
1 c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	901	Charles	Raymond	chray@obl.com	Rockets

The status bar at the bottom indicates 'Line 32 Column 31' and 'Modified'. The system tray shows the date and time as '25°C Cloudy 9:33 PM'.

Part 6

1. select 'The cost of the '|| i.name || ' on this day is ' || p.price
from items i join price_history p
on i.item_number = 'im01101045' and ('12-Dec-2016' between p.start_date and p.end_date);

The screenshot shows the Oracle SQL Developer interface. The 'Connections' sidebar lists 'HR' and 'System'. The 'Reports' sidebar lists various report types. The 'Files' sidebar shows recent files including 'mywork', 'SEC02523-02', 'SAV_AGW', and 'SWR2RAgent'. The central 'Worksheet' pane displays the SQL query:

```
1. select 'The cost of the '|| i.name || ' on this day is ' || p.price
2. from items i join price_history p
3. on i.item_number = 'im01101045' and ('12-Dec-2016' between p.start_date and p.end_date);
```

The 'Query Result' tab shows the output:

```
THECOSTOFTHE'||NAME'||ONTHISDAY'||PRICE
1 The cost of the under shirt on this day is 14.99
```

The status bar at the bottom indicates 'Saved: C:\Users\Asus\AppData\Roaming\SQL Developer\DB_LAB_3.sql'.

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The Oracle Baseball League store serves the entire surrounding community selling baseball kit. The OBL has two types of customer, there are individuals who purchase items like balls, cleats, gloves, shirts, screen printed t-shirts, and shorts. Additionally customers can represent a team when they purchase uniforms and equipment on behalf of the team.

Teams and individual customers are free to purchase any item from the inventory list, but teams get a discount on the list price depending on the number of players. When a customer places an order we record the order items for that order in our database.

OBL has a team of three sales representatives that officially only call on teams but have been known to handle individual customer complaints.

Section 6 Lesson 9 Exercise 2: Joining Tables Using JOIN

Write SELECT Statements Using Data From Multiple Tables Using Equijoins and Non-Equijoins (S6L9 Objective 1)

Part 1 : Use a Self-Join to Join a Table to Itself (S6L9 Objective 2)

1. Write a query that will display who the supervisor is for each of the sales representatives. The information should be displayed in two columns, the first column will be the first name and last name of the sales representative and the second will be the first name and last name of the supervisor. The column aliases should be Rep and Supervisor.

Part 2 : Use OUTER joins (S6L9 Objective 3)

1. Write a query that will display all of the team and customer information even if there is no match with the table on the left (team).

Part 3 : Generating a Cartesian Product (S6L9 Objective 4)

1. Create a Cartesian product between the customer and sales representative tables.

Part 1

1. select sr.first_name || ' ' || sr.last_name "Rep", sv.first_name || ' ' || sv.last_name "Supervisor"
from sales_representatives sr join sales_representatives sv
on (sr.supervisor_id = sv.id);

The screenshot shows the Oracle SQL Developer interface with the following details:

- Connections:** DB_LAB1.sql, DB_LAB_2.sql, DB_LAB_3.sql, DB_LAB_4.sql
- Reports:** All Reports, Data Dictionary View Reports, Data Modeler Reports, OLAP Reports, TimeTen Reports, User Defined Reports
- Files:** Recent Files, Desktop, Documents, My Documents, OS (C), SEC00523-02, SAV_ASW, \$Recycle.Bin, SWRERAgent
- SQL Worksheet:** Contains the SQL query from Part 1.
- Query Result 1:** Displays the output of the query, showing three rows of data:

Rep	Supervisor
1 Charles Raymond	Charles Raymond
2 Victoria Wright	Charles Raymond
3 Barry Speed	Charles Raymond

Part 2

1. select *

from teams t right outer join customers c

on t.id = c.team_id ;

The screenshot shows the Oracle SQL Developer interface with the following details:

- Connections:** Oracle Connections (HR, System).
- Reports:** All Reports, Data View Reports, Data Dictionary Reports, Data Modeler Reports, OLAP Reports, TimeTen Reports, User Defined Reports.
- Files:** Recent Files (OS C:, SAV_ASW, Recycle.Bin, SWREAgent).
- SQL Worksheet:** Contains the following SQL code:

```
--part 2
select sr.first_name||' '||sr.last_name "Rep", sv.first_name||' '||sv.last_name
:"Supervisor"
from sales_representatives sr join sales_representatives sv
on (sr.supervisor_id = sv.id);

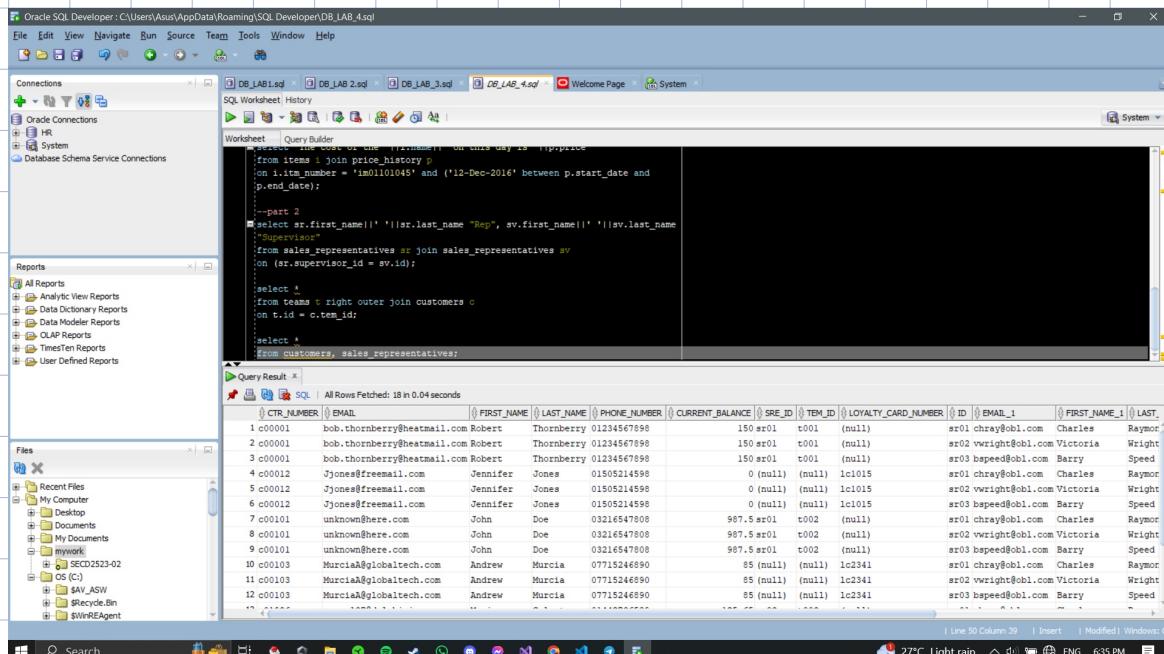
select *
from teams t right outer join customers c
on t.id = c.team_id;
```
- Query Result:** A table showing the results of the query. The columns are: ID, NAME, NUMBER_OF_PLAYERS, DISCOUNT, CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SR_ID, TEAM_ID, LOYALTY_CARD_NUM. The data is as follows:

ID	NAME	NUMBER_OF_PLAYERS	DISCOUNT	CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SR_ID	TEAM_ID	LOYALTY_CARD_NUM
t001	Rockets	25	10	000001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	(null)
2	(null)	(null)	(null)	000012	Jjones@fremail.com	Jennifer	Jones	01505214598	0	(null)	(null)	lcl015
t002	Celtics	42	20	00001	unknowhere.com	John	Doe	03216547808	987.5	sr01	t002	(null)
4	(null)	(null)	(null)	000103	Murcia@globaltech.com	Andrew	Murcia	07715246890	85	(null)	(null)	lc2341
t003	Rovers	8	(null)	01986	margal17@delphiview.com	Maria	Galant	0144273659	125.65	sr03	t003	(null)
6	(null)	(null)	(null)	02001	brianroy@hootech.com	Brian	Rogers	01654564988	50	(null)	(null)	lc4587

Part 3

1. select *

from customers , sales_representatives ;



The screenshot shows the Oracle SQL Developer interface. The left sidebar contains connections, reports, and files. The main area has a 'SQL Worksheet' tab open with the following SQL code:

```
select * from customers , sales_representatives ;
```

The 'Query Result' tab shows the output of the query:

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER	ID	EMAIL_1	FIRST_NAME_1	LAST_1
1	c00001	bob.thornberry@hotmail.com	Robert	Thornberry 01234567898	150	srl01	t001	(null)	sr01	chray@obl.com	Charles	Raynor
2	c00001	bob.thornberry@hotmail.com	Robert	Thornberry 01234567898	150	srl01	t001	(null)	sr02	vwright@obl.com	Victoria	Wright
3	c00001	bob.thornberry@hotmail.com	Robert	Thornberry 01234567898	150	srl01	t001	(null)	sr03	b-speed@obl.com	Barry	Speed
4	c00012	Jjones@freenmail.com	Jennifer	Jones 01505214598	0	(null)	(null)	lc1015	sr01	chray@obl.com	Charles	Raynor
5	c00012	Jjones@freenmail.com	Jennifer	Jones 01505214598	0	(null)	(null)	lc1015	sr02	vwright@obl.com	Victoria	Wright
6	c00012	Jjones@freenmail.com	Jennifer	Jones 01505214598	0	(null)	(null)	lc1015	sr03	b-speed@obl.com	Barry	Speed
7	c00101	unknownhere.com	John	Doe 03216547808	987.5	srl01	t001	(null)	sr01	chray@obl.com	Charles	Raynor
8	c00101	unknownhere.com	John	Doe 03216547808	987.5	srl01	t002	(null)	sr02	vwright@obl.com	Victoria	Wright
9	c00101	unknownhere.com	John	Doe 03216547808	987.5	srl01	t002	(null)	sr03	b-speed@obl.com	Barry	Speed
10	c00103	Murcia@globaltech.com	Andrew	Murcia 07715246890	85	(null)	(null)	lc2341	sr01	chray@obl.com	Charles	Raynor
11	c00103	Murcia@globaltech.com	Andrew	Murcia 07715246890	85	(null)	(null)	lc2341	sr02	vwright@obl.com	Victoria	Wright
12	c00103	Murcia@globaltech.com	Andrew	Murcia 07715246890	85	(null)	(null)	lc2341	sr03	b-speed@obl.com	Barry	Speed