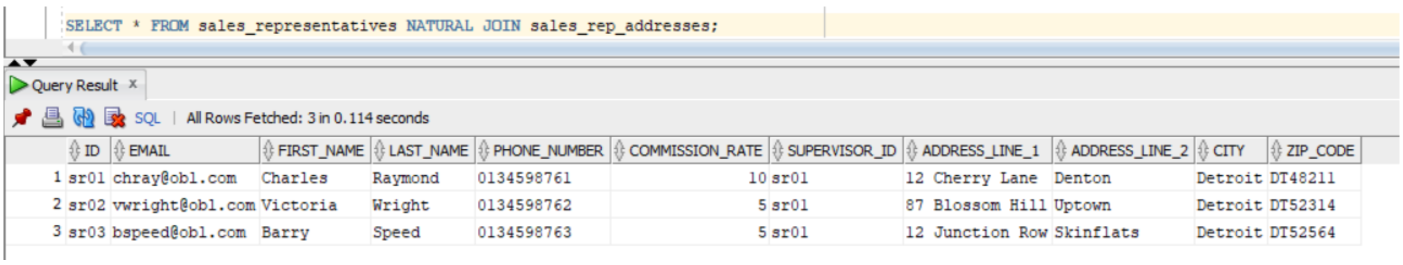
## Part 1: Creating Natural Joins.

1. Display all of the information about sales representatives and their addresses using a natural join.

SELECT * FROM sales_representatives NATURAL JOIN sales_rep_addresses;



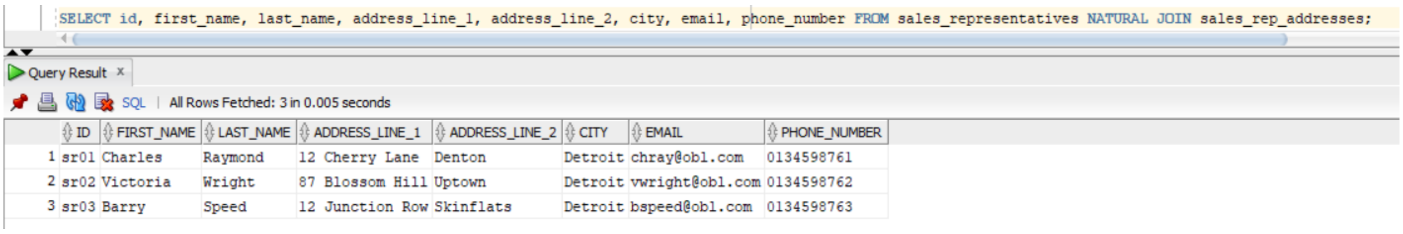
```
SELECT * FROM sales_representatives NATURAL JOIN sales_rep_addresses;
```

All Rows Fetched: 3 in 0.114 seconds

| | ID | EMAIL | FIRST_NAME | LAST_NAME | PHONE_NUMBER | COMMISSION_RATE | SUPERVISOR_ID | ADDRESS_LINE_1 | ADDRESS_LINE_2 | CITY | ZIP_CODE |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | 10 | sr01 | 12 Cherry Lane | Denton | Detroit | DT48211 |
| 2 | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | 5 | sr01 | 87 Blossom Hill | Uptown | Detroit | DT52314 |
| 3 | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | 5 | sr01 | 12 Junction Row | Skinflats | Detroit | DT52564 |

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.

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 NATURAL JOIN sales_rep_addresses;
```

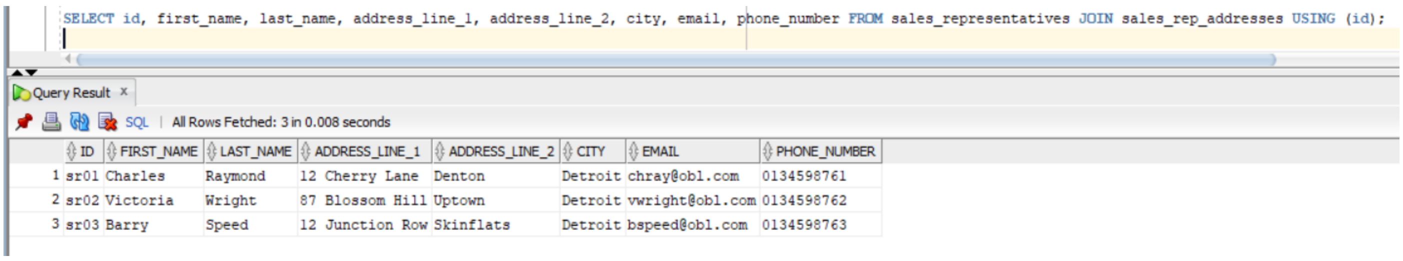
All Rows Fetched: 3 in 0.005 seconds

| | 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 |

## Part 2: Creating Joins with the USING Clause

1. Adapt the previous query answer to use the USING clause instead of a natural join.

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);



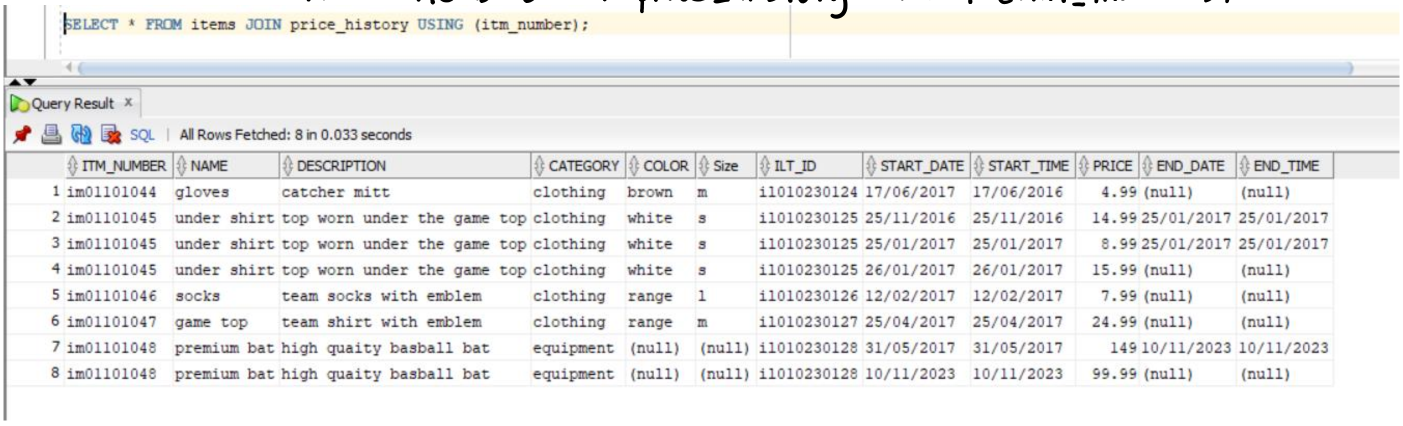
```
SELECT id, first_name, last_name, address_line_1, address_line_2, city, email, phone_number FROM sales_representatives JOIN sales_rep_addresses USING (id);
```

All Rows Fetched: 3 in 0.008 seconds

| | 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. Display all of the information about items and their price history by joining the items and price_history tables.

SELECT * FROM items JOIN price_history USING (itm_number);



```
SELECT * FROM items JOIN price_history USING (itm_number);
```

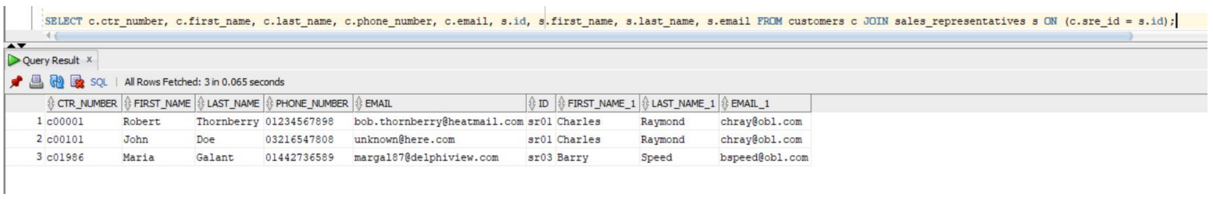
All Rows Fetched: 8 in 0.033 seconds

| | ITM_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 | i1010230124 | 17/06/2017 | 17/06/2016 | 4.99 | (null) | (null) |
| 2 | im01101045 | under shirt | top worn under the game top | clothing | white | s | i1010230125 | 25/11/2016 | 25/11/2016 | 14.99 | 25/01/2017 | 25/01/2017 |
| 3 | im01101045 | under shirt | top worn under the game top | clothing | white | s | i1010230125 | 25/01/2017 | 25/01/2017 | 8.99 | 25/01/2017 | 25/01/2017 |
| 4 | im01101045 | under shirt | top worn under the game top | clothing | white | s | i1010230125 | 26/01/2017 | 26/01/2017 | 15.99 | (null) | (null) |
| 5 | im01101046 | socks | team socks with emblem | clothing | range | l | i1010230126 | 12/02/2017 | 12/02/2017 | 7.99 | (null) | (null) |
| 6 | im01101047 | game top | team shirt with emblem | clothing | range | m | i1010230127 | 25/04/2017 | 25/04/2017 | 24.99 | (null) | (null) |
| 7 | im01101048 | premium bat | high quaity basball bat | equipment | (null) | (null) | i1010230128 | 31/05/2017 | 31/05/2017 | 149 | 10/11/2023 | 10/11/2023 |
| 8 | im01101048 | premium bat | high quaity basball bat | equipment | (null) | (null) | i1010230128 | 10/11/2023 | 10/11/2023 | 99.99 | (null) | (null) |

## 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 fist 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.

```
SELECT  c.ctr_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  Cc.sre_id = s.id )
```



```
SELECT c.ctr_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.sre_id = s.id);
```

Query Result

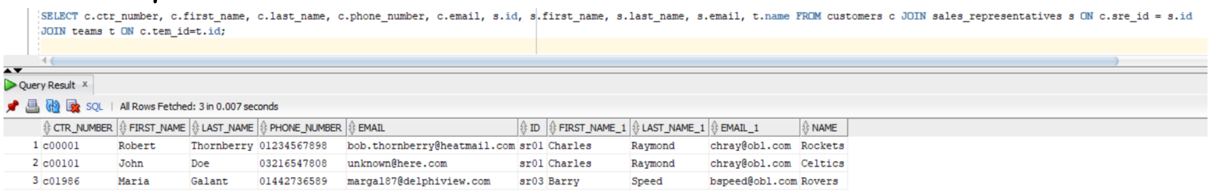
SQL | All Rows Fetched: 3 in 0.065 seconds

| | CTR_NUMBER | FIRST_NAME | LAST_NAME | PHONE_NUMBER | EMAIL | ID | FIRST_NAME_1 | LAST_NAME_1 | EMAIL_1 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | c00001 | Robert | Thornberry | 01234567898 | bob.thornberry@heatmail.com | sr01 | Charles | Raymond | chray@obl.com |
| 2 | c00101 | John | Doe | 03216547808 | unknown@here.com | sr01 | Charles | Raymond | chray@obl.com |
| 3 | c01986 | Maria | Galant | 01442736589 | margal87@delphiview.com | sr03 | Barry | Speed | bspeed@obl.com |

## 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.

```
SELECT  c.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.tem_id
= t.id ;
```



```
SELECT c.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.tem_id=t.id;
```

Query Result

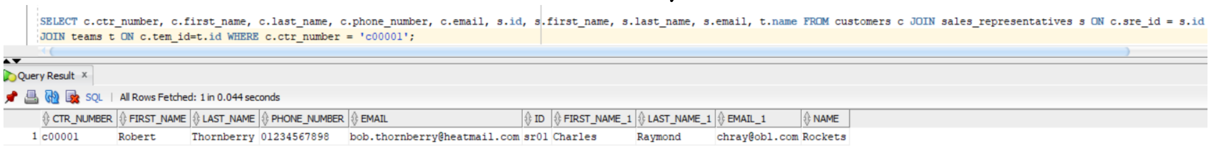
SQL | All Rows Fetched: 3 in 0.007 seconds

| | 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 | sr01 | Charles | Raymond | chray@obl.com | Rockets |
| 2 | c00101 | John | Doe | 03216547808 | unknown@here.com | sr01 | Charles | Raymond | chray@obl.com | Celtics |
| 3 | c01986 | Maria | Galant | 01442736589 | margal87@delphiview.com | sr03 | Barry | Speed | bspeed@obl.com | Rovers |

## 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.

```
SELECT  c.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.tem_id
= t.id   WHERE  c.ctr_number = 'c00001';
```



```
SELECT c.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.tem_id=t.id WHERE c.ctr_number = 'c00001';
```

Query Result

SQL | All Rows Fetched: 1 in 0.044 seconds

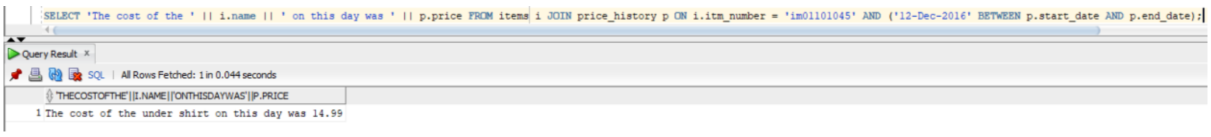
| | CTR_NUMBER | FIRST_NAME | LAST_NAME | PHONE_NUMBER | EMAIL | ID | FIRST_NAME_1 | LAST_NAME_1 | EMAIL_1 | NAME |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | c00001 | Robert | Thornberry | 01234567898 | bob.thornberry@heatmail.com | sr01 | Charles | Raymond | chray@obl.com | Rockets |

## 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

```
SELECT 'The cost of the '|| i.name || ' on this day was ' || p.price
FROM items i JOIN price_history p  ON  i.itm_number = 'im01101045'
AND ('12-Dec-2016' BETWEEN  p.start_date  AND  p.end_date );
```



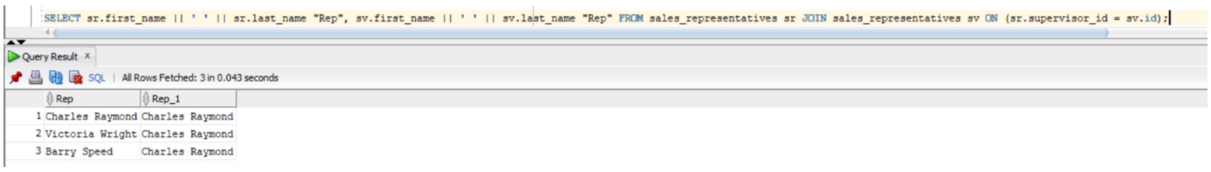
```
SELECT 'The cost of the ' || i.name || ' on this day was ' || p.price FROM items i JOIN price_history p ON i.itm_number = 'im01101045' AND ('12-Dec-2016' BETWEEN p.start_date AND p.end_date);
```

| | 'THECOSTOFTHE'\|\|I.NAME\|\|'ONTHISDAYWAS'\|\|P.PRICE |
|---|---|
| 1 | The cost of the under shirt on this day was 14.99 |

## 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.

SELECT sr.first_name ||` ' || sr.last_name "Rep", sv.first_name || ` ' || sv.last_name "Supervisor" FROM sales_reprenstatives sr JOIN sales_representatives sv ON (sr.supervisor_id = sv.id);



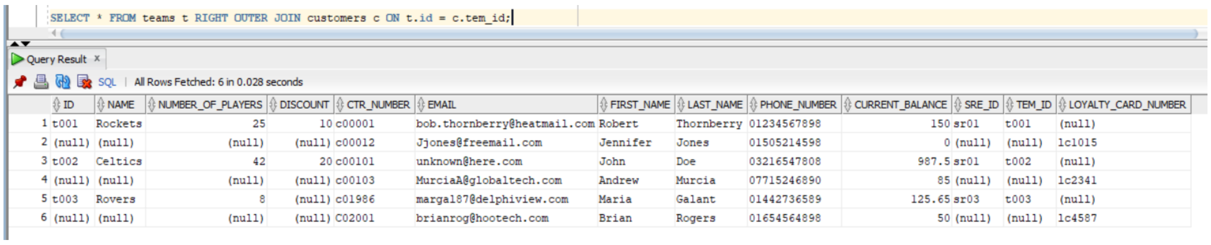
```
SELECT sr.first_name || ' ' || sr.last_name "Rep", sv.first_name || ' ' || sv.last_name "Rep" FROM sales_representatives sr JOIN sales_representatives sv ON (sr.supervisor_id = sv.id);
```

| | Rep | Rep_1 |
|---|---|---|
| 1 | Charles Raymond | Charles Raymond |
| 2 | Victoria Wright | Charles Raymond |
| 3 | Barry Speed | Charles Raymond |

## 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).

SELECT * FROM teams t RIGHT OUTER JOIN customers c ON t.id = c.tem_id



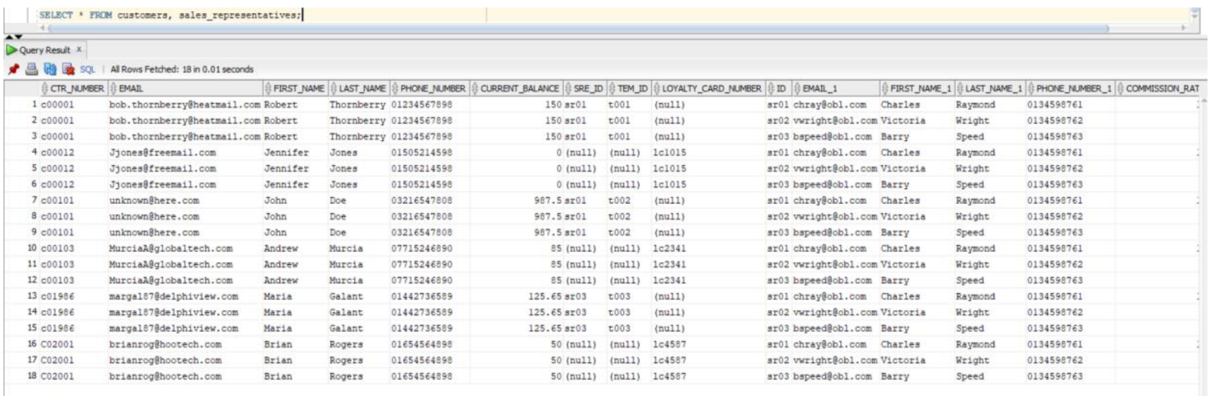
```
SELECT * FROM teams t RIGHT OUTER JOIN customers c ON t.id = c.tem_id;
```

| | ID | NAME | NUMBER_OF_PLAYERS | DISCOUNT | CTR_NUMBER | EMAIL | FIRST_NAME | LAST_NAME | PHONE_NUMBER | CURRENT_BALANCE | SRE_ID | TEM_ID | LOYALTY_CARD_NUMBER |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | t001 | Rockets | 25 | 10 | c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 01234567898 | 150 | sr01 | t001 | (null) |
| 2 | (null) | (null) | (null) | (null) | c00012 | Jjones@freemail.com | Jennifer | Jones | 01505214598 | 0 | (null) | (null) | 1c1015 |
| 3 | t002 | Celtics | 42 | 20 | c00101 | unknown@here.com | John | Doe | 03216547808 | 987.5 | sr01 | t002 | (null) |
| 4 | (null) | (null) | (null) | (null) | c00103 | MurciaA@globaltech.com | Andrew | Murcia | 07715246890 | 85 | (null) | (null) | 1c2341 |
| 5 | t003 | Rovers | 8 | (null) | c01986 | margal87@delphiview.com | Maria | Galant | 01442736589 | 125.65 | sr03 | t003 | (null) |
| 6 | (null) | (null) | (null) | (null) | C02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | 50 | (null) | (null) | 1c4587 |

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

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

SELECT * FROM customers, sales_representatives;



```
SELECT * FROM customers, sales_representatives;
```

| | 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_NAME_1 | PHONE_NUMBER_1 | COMMISSION_RAT |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 01234567898 | 150 | sr01 | t001 | (null) | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | |
| 2 | c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 01234567898 | 150 | sr01 | t001 | (null) | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | |
| 3 | c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 01234567898 | 150 | sr01 | t001 | (null) | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | |
| 4 | c00012 | Jjones@freemail.com | Jennifer | Jones | 01505214598 | 0 | (null) | (null) | 1c1015 | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | |
| 5 | c00012 | Jjones@freemail.com | Jennifer | Jones | 01505214598 | 0 | (null) | (null) | 1c1015 | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | |
| 6 | c00012 | Jjones@freemail.com | Jennifer | Jones | 01505214598 | 0 | (null) | (null) | 1c1015 | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | |
| 7 | c00101 | unknown@here.com | John | Doe | 03216547808 | 987.5 | sr01 | t002 | (null) | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | |
| 8 | c00101 | unknown@here.com | John | Doe | 03216547808 | 987.5 | sr01 | t002 | (null) | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | |
| 9 | c00101 | unknown@here.com | John | Doe | 03216547808 | 987.5 | sr01 | t002 | (null) | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | |
| 10 | c00103 | MurciaA@globaltech.com | Andrew | Murcia | 07715246890 | 85 | (null) | (null) | 1c2341 | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | |
| 11 | c00103 | MurciaA@globaltech.com | Andrew | Murcia | 07715246890 | 85 | (null) | (null) | 1c2341 | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | |
| 12 | c00103 | MurciaA@globaltech.com | Andrew | Murcia | 07715246890 | 85 | (null) | (null) | 1c2341 | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | |
| 13 | c01986 | margal87@delphiview.com | Maria | Galant | 01442736589 | 125.65 | sr03 | t003 | (null) | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | |
| 14 | c01986 | margal87@delphiview.com | Maria | Galant | 01442736589 | 125.65 | sr03 | t003 | (null) | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | |
| 15 | c01986 | margal87@delphiview.com | Maria | Galant | 01442736589 | 125.65 | sr03 | t003 | (null) | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | |
| 16 | C02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | 50 | (null) | (null) | 1c4587 | sr01 | chray@obl.com | Charles | Raymond | 0134598761 | |
| 17 | C02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | 50 | (null) | (null) | 1c4587 | sr02 | vwright@obl.com | Victoria | Wright | 0134598762 | |
| 18 | C02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | 50 | (null) | (null) | 1c4587 | sr03 | bspeed@obl.com | Barry | Speed | 0134598763 | |