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SQL 4 PART 1

Part 1 - Creating Natural Joins

1. SELECT \* FROM sales-representatives  
NATURAL JOIN sales\_rep-addresses;

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;

Part 2 - Creating joins with the USING clause

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);

2. SELECT \* FROM items  
JOIN price-history USING (itm-number);

Part 3 - Creating joins with the ON clause

1. SELECT c.cst\_number AS "Customer Number",  
c.first\_name AS "Customer First Name",  
c.last\_name AS "Customer Last Name",  
c.phone\_number AS "Customer Phone Number",  
c.email AS "Customer Email",  
sr.id AS "Sales Representative ID",  
sr.first\_name AS "Sales Representative First Name",  
sr.last\_name AS "Sales Representative Last Name",  
sr.email AS "Sales Representative Email",  
FROM customer c  
JOIN sales-representatives sr ON c.sr\_id = sr.id;



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

```
1. SELECT c.ctr_number AS "Customer Number",
       c.first_name AS "Customer First Name",
       c.last_name AS "Customer Last Name",
       c.phone_number AS "Customer Phone Number",
       c.email AS "Customer Email",
       sr.id AS "Sales Representative ID",
       sr.first_name AS "Sales Representative First Name",
       sr.last_name AS "Sales Representative Last Name",
       sr.email AS "Sales Representative Email",
       t.name AS "Team Name"
FROM customer c
JOIN sales_representatives sr ON c.sr_id = sr.id
JOIN teams t ON team_id = t.id;
```

#### Part 5 - Applying Additional Condition to a Join

```
SELECT c.ctr_number AS "Customer Number",
       c.first_name AS "Customer First Name",
       c.last_name AS "Customer Last Name",
       c.phone_number AS "Customer Phone Number",
       c.email AS "Customer Email",
       sr.id AS "Sales Representative ID",
       sr.first_name AS "Sales Representative First Name",
       sr.last_name AS "Sales Representative Last Name",
       sr.email AS "Sales Representative Last Name",
       t.name AS "Team Name"
FROM customer c
JOIN sales_representatives sr ON c.sr_id = sr.id
JOIN teams t ON c.team_id = t.id
WHERE c.ctr_number = '000001';
```



## Part 6 - Retrieving Records with Nonequijoins

```
SELECT 'The cost of the' || i.name || ' on this day was ' || p.price
      AS "Price of the Items"
```

```
FROM item i
```

```
JOIN inventory-list invl ON i.ilt_id = invl.id
```

```
JOIN price-history ON i.itm-number = p.itm-number
```

```
WHERE i.itm-number = 'im01101045'
```

```
AND p.start-date >= TO_DATE('12-Dec-2016', 'DD-Mon-YYYY')
```

```
AND p.start-date < TO_DATE('12-Dec-2016', 'DD-Mon-YYYY')
```

## SQL 4 PART 2

## Part 1 - Use a Self-Join to Join a Table to Itself

1. 

```
SELECT rep.first_name || ' ' || rep.last_name AS "Rep",
      sup.first_name || ' ' || sup.last_name AS "Supervisor"
FROM sales_representatives rep
LEFT JOIN sales_representatives sup ON rep.supervisor_id = sup.id;
```

## Part 2 - Use OUTER joins

1. 

```
SELECT t.id AS "Team ID",
      t.name AS "Team Name",
      t.number_of_players AS "Number of Players",
      t.discount AS "Discount",
      c.cfr_number AS "Customer Number",
      c.email AS "Customer Email",
      c.first_name AS "Customer First Name",
      c.last_name AS "Customer Last Name",
      c.phone_number AS "Customer Phone Number",
      c.current_balance AS "Customer Current Balance"
```

```
FROM teams t
```

```
LEFT JOIN customers c ON t.id = c.team_id;
```

## Part 3 - Generating a Cartesian Product

1. 

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

SQL 4

PART 1

### Part 1: Creating Natural Joins

1.

SELECT \*

FROM sales\_representatives

NATURAL JOIN sales\_rep\_addresses;

| 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.

SELECT

id,

first\_name,

last\_name,

address\_line\_1,

address\_line\_2,

city,

email,

phone\_number

FROM

sales\_representatives

NATURAL JOIN

sales\_rep\_addresses;

| 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.

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);

|   | 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 (itm\_number);

|   | 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-JUN-17  | 17-JUN-16  | 4.99 (null)  | (null)    | (null)    |
| 2 | im01101045 | under shirt top | worn under the game top   | clothing  | white  | s      | i1010230125 | 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      | i1010230125 | 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      | i1010230125 | 26-JAN-17  | 26-JAN-17  | 15.99 (null) | (null)    | (null)    |
| 5 | im01101046 | socks           | team socks with emblem    | clothing  | range  | l      | i1010230126 | 12-FEB-17  | 12-FEB-17  | 7.99 (null)  | (null)    | (null)    |
| 6 | im01101047 | game top        | team shirt with emblem    | clothing  | range  | m      | i1010230127 | 25-APR-17  | 25-APR-17  | 24.99 (null) | (null)    | (null)    |
| 7 | im01101048 | premium bat     | high quality baseball bat | equipment | (null) | (null) | i1010230128 | 31-MAY-17  | 31-MAY-17  | 149          | 09-NOV-23 | 09-NOV-23 |
| 8 | im01101048 | premium bat     | high quality baseball bat | equipment | (null) | (null) | i1010230128 | 09-NOV-23  | 09-NOV-23  | 99.99 (null) | (null)    | (null)    |

### Part 3: Creating Joins with the ON Clause

1.

SELECT

```
c.ctr_number AS "Customer Number",  
c.first_name AS "Customer First Name",  
c.last_name AS "Customer Last Name",  
c.phone_number AS "Customer Phone Number",  
c.email AS "Customer Email",  
sr.id AS "Sales Representative ID",  
sr.first_name AS "Sales Representative First Name",  
sr.last_name AS "Sales Representative Last Name",  
sr.email AS "Sales Representative Email"
```

FROM

```
customers c
```

JOIN

```
sales_representatives sr ON c.sre_id = sr.id;
```

| Customer Number | Customer First Name | Customer Last Name | Customer Phone Number | Customer Email              | Sales Representative ID | Sales Representative First Name | Sales Representative Last Name | Sales Representative Email |
|-----------------|---------------------|--------------------|-----------------------|-----------------------------|-------------------------|---------------------------------|--------------------------------|----------------------------|
| 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           | marga187@delphiview.com     | sr03                    | Barry                           | Speed                          | bspeed@obl.com             |

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

1.

SELECT

```
c.ctr_number AS "Customer Number",  
c.first_name AS "Customer First Name",  
c.last_name AS "Customer Last Name",  
c.phone_number AS "Customer Phone Number",  
c.email AS "Customer Email",  
sr.id AS "Sales Representative ID",  
sr.first_name AS "Sales Representative First Name",  
sr.last_name AS "Sales Representative Last Name",  
sr.email AS "Sales Representative Email",
```

t.name AS "Team Name"

FROM

customers c

JOIN

sales\_representatives sr ON c.sre\_id = sr.id

JOIN

teams t ON c.tem\_id = t.id;

| Customer Number | Customer First Name | Customer Last Name | Customer Phone Number | Customer Email              | Sales Representative ID | Sales Representative First Name | Sales Representative Last Name | Sales Representative Email | Team 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

SELECT

c.ctr\_number AS "Customer Number",

c.first\_name AS "Customer First Name",

c.last\_name AS "Customer Last Name",

c.phone\_number AS "Customer Phone Number",

c.email AS "Customer Email",

sr.id AS "Sales Representative ID",

sr.first\_name AS "Sales Representative First Name",

sr.last\_name AS "Sales Representative Last Name",

sr.email AS "Sales Representative Email",

t.name AS "Team Name"

FROM

customers c

JOIN

sales\_representatives sr ON c.sre\_id = sr.id

JOIN

teams t ON c.tem\_id = t.id

WHERE

c.ctr\_number = 'c00001';

| Customer Number | Customer First Name | Customer Last Name | Customer Phone Number | Customer Email              | Sales Representative ID | Sales Representative First Name | Sales Representative Last Name | Sales Representative Email | Team Name |
|-----------------|---------------------|--------------------|-----------------------|-----------------------------|-------------------------|---------------------------------|--------------------------------|----------------------------|-----------|
| 1 c00001        | Robert              | Thornberry         | 01234567898           | bob.thornberry@heatmail.com | sr01                    | Charles                         | Raymond                        | chray@obl.com              | Rockets   |

## Part 6: Retrieving Records with Nonequijoins

```
SELECT
    'The cost of the' || i.name || 'on this day was ' || p.price AS "Price of the Items"
FROM
    items i
JOIN
    Inventory_list inv_l ON i.ilt_id = inv_l.id
JOIN
    price_history p ON i.itm_number = p.itm_number
WHERE
    i.itm_number = 'im01101045'
    AND p.start_date >= TO_DATE('12-Dec-2016', 'DD-Mon-YYYY')
    AND p.start_date < TO_DATE('13-Dec-2016', 'DD-Mon-YYYY');
```

| OUTPUT |   |
|--------|---|
| 1      | The cost of the under shirt on this day was 14.99 |

## PART 2

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

1.

```
SELECT
    rep.first_name || ' ' || rep.last_name AS "Rep",
    sup.first_name || ' ' || sup.last_name AS "Supervisor"
FROM
    sales_representatives rep
LEFT JOIN
    sales_representatives sup ON rep.supervisor_id = sup.id;
```

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



## Part 2 : Use OUTER joins (S6L9 Objective 3)

SELECT

t.id AS "Team ID",  
t.name AS "Team Name",  
t.number\_of\_players AS "Number of Players",  
t.discount AS "Discount",  
c.ctr\_number AS "Customer Number",  
c.email AS "Customer Email",  
c.first\_name AS "Customer First Name",  
c.last\_name AS "Customer Last Name",  
c.phone\_number AS "Customer Phone Number",  
c.current\_balance AS "Customer Current Balance"

FROM

teams t

LEFT JOIN

customers c ON t.id = c.tem\_id;

| Team ID | Team Name | Number of Players | Discount | Customer Number | Customer Email              | Customer First Name | Customer Last Name | Customer Phone Number | Customer Current Balance |
|---------|-----------|-------------------|----------|-----------------|-----------------------------|---------------------|--------------------|-----------------------|--------------------------|
| 1 t001  | Rockets   | 25                | 10       | c00001          | bob.thornberry@heatmail.com | Robert              | Thornberry         | 01234567898           | 150                      |
| 2 t002  | Celtics   | 42                | 20       | c00101          | unknown@here.com            | John                | Doe                | 03216547808           | 987.5                    |
| 3 t003  | Rovers    | 8                 | (null)   | c01986          | margal87@delphiview.com     | Maria               | Galant             | 01442736589           | 125.65                   |
| 4 t004  | Jets      | 10                | 5        | (null)          | (null)                      | (null)              | (null)             | (null)                | (null)                   |

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

SELECT

c.ctr\_number AS "Customer Number",  
c.email AS "Customer Email",  
c.first\_name AS "Customer First Name",  
c.last\_name AS "Customer Last Name",  
c.phone\_number AS "Customer Phone Number",  
c.current\_balance AS "Customer Current Balance",  
sr.id AS "Sales Representative ID",  
sr.email AS "Sales Representative Email",

```

sr.first_name AS "Sales Representative First Name",

sr.last_name AS "Sales Representative Last Name",

sr.phone_number AS "Sales Representative Phone Number",

sr.commission_rate AS "Sales Representative Commission Rate",

sr.supervisor_id AS "Sales Representative Supervisor ID"

```

```

FROM

```

```

    customers c

```

```

CROSS JOIN

```

```

    sales_representatives sr;

```

| Customer Number | Customer Email              | Customer First Name | Customer Last Name | Customer Phone Number | Customer Current Balance | Sales Representative ID | Sales Representative Email | Sales Representative First Name | Sales Representative Last Name | Sales Representative Phone Number | Sales Representative Commission Rate | Sales Representative Supervisor ID |
|-----------------|-----------------------------|---------------------|--------------------|-----------------------|--------------------------|-------------------------|----------------------------|---------------------------------|--------------------------------|-----------------------------------|--------------------------------------|------------------------------------|
| 1 c00001        | bob.thornberry@heatmail.com | Robert              | Thornberry         | 01234567890           | 150.0001                 |                         | chray@bbl.com              | Charles                         | Raymond                        | 013456781                         | 10.0001                              |                                    |
| 2 c00012        | jyness@fresmail.com         | Jennifer            | Jones              | 01505214590           | 0.0001                   |                         | chray@bbl.com              | Charles                         | Raymond                        | 013456781                         | 10.0001                              |                                    |
| 3 c00101        | unknown@here.com            | John                | Doe                | 03214567890           | 987.5001                 |                         | chray@bbl.com              | Charles                         | Raymond                        | 013456781                         | 10.0001                              |                                    |
| 4 c00103        | Murcia@iglobattech.com      | Andrew              | Murcia             | 07715246090           | 18.0001                  |                         | chray@bbl.com              | Charles                         | Raymond                        | 013456781                         | 10.0001                              |                                    |
| 5 c01896        | margal17@nlpview.com        | Maria               | Galant             | 01442736589           | 129.45001                |                         | chray@bbl.com              | Charles                         | Raymond                        | 013456781                         | 10.0001                              |                                    |
| 6 c02001        | brianzng@roottech.com       | Brian               | Roger              | 01654564890           | 50.0001                  |                         | chray@bbl.com              | Charles                         | Raymond                        | 013456781                         | 10.0001                              |                                    |
| 7 c00001        | bob.thornberry@heatmail.com | Robert              | Thornberry         | 01234567890           | 150.0002                 |                         | vwright@bbl.com            | Victoria                        | Wright                         | 013456782                         | 5.0001                               |                                    |
| 8 c00012        | jyness@fresmail.com         | Jennifer            | Jones              | 01505214590           | 0.0002                   |                         | vwright@bbl.com            | Victoria                        | Wright                         | 013456782                         | 5.0001                               |                                    |
| 9 c00101        | unknown@here.com            | John                | Doe                | 03214567890           | 987.5002                 |                         | vwright@bbl.com            | Victoria                        | Wright                         | 013456782                         | 5.0001                               |                                    |
| 10 c00103       | Murcia@iglobattech.com      | Andrew              | Murcia             | 07715246090           | 18.0002                  |                         | vwright@bbl.com            | Victoria                        | Wright                         | 013456782                         | 5.0001                               |                                    |
| 11 c01896       | margal17@nlpview.com        | Maria               | Galant             | 01442736589           | 129.45002                |                         | vwright@bbl.com            | Victoria                        | Wright                         | 013456782                         | 5.0001                               |                                    |
| 12 c02001       | brianzng@roottech.com       | Brian               | Roger              | 01654564890           | 50.0002                  |                         | vwright@bbl.com            | Victoria                        | Wright                         | 013456782                         | 5.0001                               |                                    |
| 13 c00001       | bob.thornberry@heatmail.com | Robert              | Thornberry         | 01234567890           | 150.0003                 |                         | haped@bbl.com              | Barry                           | Speed                          | 013456783                         | 5.0001                               |                                    |
| 14 c00012       | jyness@fresmail.com         | Jennifer            | Jones              | 01505214590           | 0.0003                   |                         | haped@bbl.com              | Barry                           | Speed                          | 013456783                         | 5.0001                               |                                    |
| 15 c00101       | unknown@here.com            | John                | Doe                | 03214567890           | 987.5003                 |                         | haped@bbl.com              | Barry                           | Speed                          | 013456783                         | 5.0001                               |                                    |
| 16 c00103       | Murcia@iglobattech.com      | Andrew              | Murcia             | 07715246090           | 18.0003                  |                         | haped@bbl.com              | Barry                           | Speed                          | 013456783                         | 5.0001                               |                                    |
| 17 c01896       | margal17@nlpview.com        | Maria               | Galant             | 01442736589           | 129.45003                |                         | haped@bbl.com              | Barry                           | Speed                          | 013456783                         | 5.0001                               |                                    |
| 18 c02001       | brianzng@roottech.com       | Brian               | Roger              | 01654564890           | 50.0003                  |                         | haped@bbl.com              | Barry                           | Speed                          | 013456783                         | 5.0001                               |                                    |