



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

UNIVERSITI TEKNOLOGI MALAYSIA

SEMESTER 1, SESSION 2023/2024

# LAB EXERCISE 4

**SECD2523 : DATABASE**

**SECTION 10**

---

<b>NAME :</b>	AINNUR ALIS NABELLA BINTI AHMAD SHUKRI
<b>MATRIC NUMBER :</b>	B23CS0003
<b>LECTURER'S NAME :</b>	MRS. ROZILAWATI BINTI DOLLAH @ MD ZAIN

## 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.

```
1 v SELECT *
2   FROM sales_representatives
3  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
sr01	chray@obl.com	Charles	Raymond	0134598761	10	sr01	12 Cherry Lane	Denton	Detroit	DT48211
sr02	vwright@obl.com	Victoria	Wright	0134598762	5	sr01	87 Blossom Hill	Uptown	Detroit	DT52314
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.

```
1 v SELECT
2     sr.id,
3     sr.first_name,
4     sr.last_name,
5     sra.address_line_1,
6     sra.address_line_2,
7     sra.city,
8     sr.email,
9     sr.phone_number
10  FROM sales_representatives sr
11 JOIN sales_rep_addresses sra ON sr.id = sra.id;
```

ID	FIRST_NAME	LAST_NAME	ADDRESS_LINE_1	ADDRESS_LINE_2	CITY	EMAIL	PHONE_NUMBER
sr01	Charles	Raymond	12 Cherry Lane	Denton	Detroit	chray@obl.com	0134598761
sr02	Victoria	Wright	87 Blossom Hill	Uptown	Detroit	vwright@obl.com	0134598762
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.

```
1 v SELECT
2     id,
3     first_name,
4     last_name,
5     address_line_1,
6     address_line_2,
7     city,
8     email,
9     phone_number
10  FROM sales_representatives
11  JOIN sales_rep_addresses USING (id);
```

ID	FIRST_NAME	LAST_NAME	ADDRESS_LINE_1	ADDRESS_LINE_2	CITY	EMAIL	PHONE_NUMBER
sr01	Charles	Raymond	12 Cherry Lane	Denton	Detroit	chray@obl.com	0134598761
sr02	Victoria	Wright	87 Blossom Hill	Uptown	Detroit	vwright@obl.com	0134598762
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.

```
1 v SELECT *
2  FROM items
3  JOIN price_history ON items.itm_number = price_history.itm_number;
```

ITM_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	Size	ILT_ID	START_DATE	START_TIME	PRICE	END_DATE	END_TIME	ITM_NUMBER
im01101044	gloves	catcher mitt	clothing	brown	m	il010230124	17-JUN-17	17-JUN-16	4.99	-	-	im01101044
im01101045	under shirt	top worn under the game top	clothing	white	s	il010230125	25-NOV-16	25-NOV-16	14.99	25-JAN-17	25-JAN-17	im01101045
im01101045	under shirt	top worn under the game top	clothing	white	s	il010230125	25-JAN-17	25-JAN-17	8.99	25-JAN-17	25-JAN-17	im01101045
im01101045	under shirt	top worn under the game top	clothing	white	s	il010230125	26-JAN-17	26-JAN-17	15.99	-	-	im01101045
im01101046	socks	team socks with emblem	clothing	range	l	il010230126	12-FEB-17	12-FEB-17	7.99	-	-	im01101046
im01101047	game top	team shirt with emblem	clothing	range	m	il010230127	25-APR-17	25-APR-17	24.99	-	-	im01101047
im01101048	premium bat	high quaity baseball bat	equipment	-	-	il010230128	31-MAY-17	31-MAY-17	149	-	-	im01101048

## 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.

```
1 v SELECT
2     c.ctr_number AS "Customer Number",
3     c.first_name AS "Customer First Name",
4     c.last_name AS "Customer Last Name",
5     c.phone_number AS "Customer Phone Number",
6     c.email AS "Customer Email",
7     sr.id AS "Sales Representative ID",
8     sr.first_name AS "Sales Representative First Name",
9     sr.last_name AS "Sales Representative Last Name",
10    sr.email AS "Sales Representative Email"
11  FROM customers c
12  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
c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	sr01	Charles	Raymond	chray@obl.com
c00101	John	Doe	03216547808	unknown@here.com	sr01	Charles	Raymond	chray@obl.com
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.

```
1 v SELECT
2     c.ctr_number AS "Customer Number",
3     c.first_name AS "Customer First Name",
4     c.last_name AS "Customer Last Name",
5     c.phone_number AS "Customer Phone Number",
6     c.email AS "Customer Email",
7     sr.id AS "Sales Representative ID",
8     sr.first_name AS "Sales Representative First Name",
9     sr.last_name AS "Sales Representative Last Name",
10    sr.email AS "Sales Representative Email",
11    t.name AS "Team Name"
12 FROM customers c
13 JOIN sales_representatives sr ON c.sre_id = sr.id
14 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
c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	sr01	Charles	Raymond	chray@obl.com	Rockets
c00101	John	Doe	03216547808	unknown@here.com	sr01	Charles	Raymond	chray@obl.com	Celtics
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.

```
1 v SELECT
2     c.ctr_number AS "Customer Number",
3     c.first_name AS "Customer First Name",
4     c.last_name AS "Customer Last Name",
5     c.phone_number AS "Customer Phone Number",
6     c.email AS "Customer Email",
7     sr.id AS "Sales Representative ID",
8     sr.first_name AS "Sales Representative First Name",
9     sr.last_name AS "Sales Representative Last Name",
10    sr.email AS "Sales Representative Email",
11    t.name AS "Team Name"
12 FROM customers c
13 JOIN sales_representatives sr ON c.sre_id = sr.id
14 JOIN teams t ON c.tem_id = t.id
15 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
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

```
1 v SELECT
2     'The cost of the ' || i.name || ' on ' || TO_CHAR(ph.start_date, 'DDth Month YYYY') || ' was ' || ph.price AS "Result"
3 FROM
4     items i
5 JOIN
6     price_history ph ON i.itm_number = ph.itm_number
7 WHERE
8     i.itm_number = 'im01101045'
9     AND TO_DATE('12-Dec-2016', 'DD-Mon-YYYY') BETWEEN ph.start_date AND NVL(ph.end_date, SYSDATE);
```

### Result

The cost of the under shirt on 25TH November 2016 was 14.99
---

## 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.

```
1 v SELECT
2     rep.first_name || ' ' || rep.last_name AS "Rep",
3     sup.first_name || ' ' || sup.last_name AS "Supervisor"
4 FROM
5     sales_representatives rep
6 LEFT JOIN
7     sales_representatives sup ON rep.supervisor_id = sup.id;
```

Rep	Supervisor
Charles Raymond	Charles Raymond
Victoria Wright	Charles Raymond
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).

```
1 v SELECT
2     t.id AS "Team ID",
3     t.name AS "Team Name",
4     t.number_of_players AS "Number of Players",
5     t.discount AS "Discount",
6     c.ctr_number AS "Customer Number",
7     c.first_name AS "Customer First Name",
8     c.last_name AS "Customer Last Name",
9     c.phone_number AS "Customer Phone Number",
10    c.email AS "Customer Email"
11 FROM
12     teams t
13 LEFT OUTER JOIN
14     customers c ON t.id = c.tem_id;
```

Team ID	Team Name	Number of Players	Discount	Customer Number	Customer First Name	Customer Last Name	Customer Phone Number	Customer Email
t001	Rockets	25	10	c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com
t002	Celtics	42	20	c00101	John	Doe	03216547808	unknown@here.com
t003	Rovers	8	-	c01986	Maria	Galant	01442736589	marga187@delphiview.com

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

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

```

1 v SELECT
2     c.ctr_number AS "Customer Number",
3     c.first_name AS "Customer First Name",
4     c.last_name AS "Customer Last Name",
5     c.phone_number AS "Customer Phone Number",
6     c.email AS "Customer Email",
7     sr.id AS "Sales Representative ID",
8     sr.first_name AS "Sales Representative First Name",
9     sr.last_name AS "Sales Representative Last Name",
10    sr.phone_number AS "Sales Representative Phone Number",
11    sr.email AS "Sales Representative Email"
12 FROM
13     customers c
14 CROSS JOIN
15     sales_representatives sr;

```

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 Phone Number	Sales Representative Email
c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	sr01	Charles	Raymond	0134598761	chray@obl.com
c00012	Jennifer	Jones	01505214598	Jjones@freemail.com	sr01	Charles	Raymond	0134598761	chray@obl.com
c00101	John	Doe	03216547808	unknown@here.com	sr01	Charles	Raymond	0134598761	chray@obl.com
c00103	Andrew	Murcia	07715246890	MurciaA@globaltech.com	sr01	Charles	Raymond	0134598761	chray@obl.com
c01986	Maria	Galant	01442736589	margal87@delphiview.com	sr01	Charles	Raymond	0134598761	chray@obl.com
c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	sr02	Victoria	Wright	0134598762	vwright@obl.com
c00012	Jennifer	Jones	01505214598	Jjones@freemail.com	sr02	Victoria	Wright	0134598762	vwright@obl.com
c00101	John	Doe	03216547808	unknown@here.com	sr02	Victoria	Wright	0134598762	vwright@obl.com
c00103	Andrew	Murcia	07715246890	MurciaA@globaltech.com	sr02	Victoria	Wright	0134598762	vwright@obl.com
c01986	Maria	Galant	01442736589	margal87@delphiview.com	sr02	Victoria	Wright	0134598762	vwright@obl.com
c00001	Robert	Thornberry	01234567898	bob.thornberry@heatmail.com	sr03	Barry	Speed	0134598763	bspeed@obl.com
c00012	Jennifer	Jones	01505214598	Jjones@freemail.com	sr03	Barry	Speed	0134598763	bspeed@obl.com
c00101	John	Doe	03216547808	unknown@here.com	sr03	Barry	Speed	0134598763	bspeed@obl.com
c00103	Andrew	Murcia	07715246890	MurciaA@globaltech.com	sr03	Barry	Speed	0134598763	bspeed@obl.com
c01986	Maria	Galant	01442736589	margal87@delphiview.com	sr03	Barry	Speed	0134598763	bspeed@obl.com