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Faculty of
Computer Science
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UNIVERSITI TEKNOLOGI MALAYSIA, JOHOR BAHRU

FACULTY OF COMPUTING

SECD2523-08 DATABASE

Lab 3: Data Manipulation Language (DML) 3

<i>Name</i>	<i>Matric Number</i>
<i>Ahmed Zaki Al-Gabaly</i>	<i>A22EC4003</i>

Lecturer: Dr. Noor Hidayah Binti Zakaria

Section 6 Lesson 9 Exercise 1: Joining Tables Using JOIN

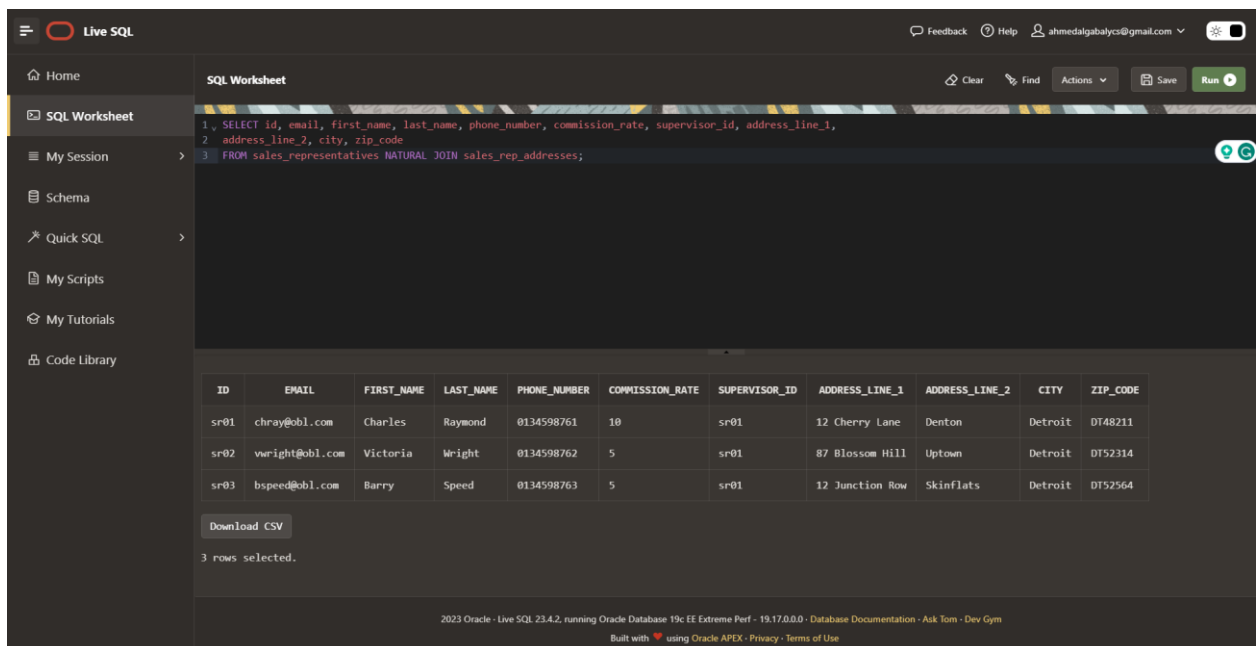
Write SELECT Statements Using Data From Multiple Tables Using Equijoins and Non-Equijoins (S6L9

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.



The screenshot shows the Live SQL interface. The SQL Worksheet contains the following query:

```
1, SELECT id, email, first_name, last_name, phone_number, commission_rate, supervisor_id, address_line_1,  
2 address_line_2, city, zip_code  
3 FROM sales_representatives NATURAL JOIN sales_rep_addresses;
```

The results table displays the following data:

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

Below the table, there is a "Download CSV" button and a message "3 rows selected." At the bottom, the footer text reads: "2023 Oracle - Live SQL 23.4.2, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym. Built with ❤️ using Oracle APEX - Privacy - Terms of Use".

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.

Live SQL

SQL Worksheet

```

1, SELECT id, first_name, last_name, address_line_1, address_line_2, city, email, phone_number
2 FROM sales_representatives NATURAL JOIN sales_rep_addresses;

```

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

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Part 2: Creating Joins with the USING Clause

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

Live SQL

SQL Worksheet

```

1, SELECT id, first_name, last_name, address_line_1, address_line_2, city, email, phone_number
2 FROM sales_representatives JOIN sales_rep_addresses
3 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

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

Live SQL

SQL Worksheet

```

1, SELECT itm_number, name, description, category, color, "Size", ilt_id,
2 start_date, start_time, price, end_date, end_time
3 FROM Items JOIN price_history
4 USING (itm_number);

```

ITM_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	Size	ILT_ID	START_DATE	START_TIME	PRICE	END_DATE	END_TIME
im01101048	premium bat	high quaity baseball bat	equipment	-	-	il010230128	16-DEC-23	16-DEC-23	99.99	-	-
im01101044	gloves	catcher mitt	clothing	brown	m	il010230124	17-JUN-17	17-JUN-16	4.99	-	-
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	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	under shirt	top worn under the game top	clothing	white	s	il010230125	26-JAN-17	26-JAN-17	15.99	16-DEC-23	16-DEC-23
im01101046	socks	team socks with emblem	clothing	range	l	il010230126	12-FEB-17	12-FEB-17	7.99	-	-
im01101047	game top	team shirt with emblem	clothing	range	m	il010230127	25-APR-17	25-APR-17	24.99	-	-
im01101048	premium bat	high quaity baseball bat	equipment	-	-	il010230128	31-MAY-17	31-MAY-17	149	-	-

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8 rows selected.

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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.

Live SQL

SQL Worksheet

```

1, SELECT c.ctr_number AS "Customer Number",
2 c.first_name AS "Customer First Name",
3 c.last_name AS "Customer Last Name",
4 c.phone_number AS "Customer Phone Number",
5 c.email AS "Customer Email",
6 s.id AS "Sales Representative ID",
7 s.first_name AS "Sales Representative First Name",
8 s.last_name AS "Sales Representative Last Name",
9 s.email AS "Sales Representative Email"
10 FROM customers c JOIN sales_representatives s
11 ON s.id = c.sre_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

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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.

The screenshot shows the Live SQL interface with a SQL Worksheet. The query is as follows:

```

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

```

The results table shows 3 rows selected:

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

Download CSV
3 rows selected.

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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.

The screenshot shows the Live SQL interface with a SQL Worksheet. The query is as follows:

```

1. SELECT c.ctr_number AS "Customer Number",
2. c.first_name AS "Customer First Name",
3. c.last_name AS "Customer Last Name",
4. c.phone_number AS "Customer Phone Number",
5. c.email AS "Customer Email",
6. s.id AS "Sales Representative ID",
7. s.first_name AS "Sales Representative First Name",
8. s.last_name AS "Sales Representative Last Name",
9. s.email AS "Sales Representative Email",
10. t.name AS "Team Name"
11. FROM customers c JOIN sales_representatives s
12. ON c.sre_id=s.id
13. JOIN teams t
14. ON c.tem_id = t.id
15. WHERE c.ctr_number = 'c00001';

```

The results table shows 3 rows selected:

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

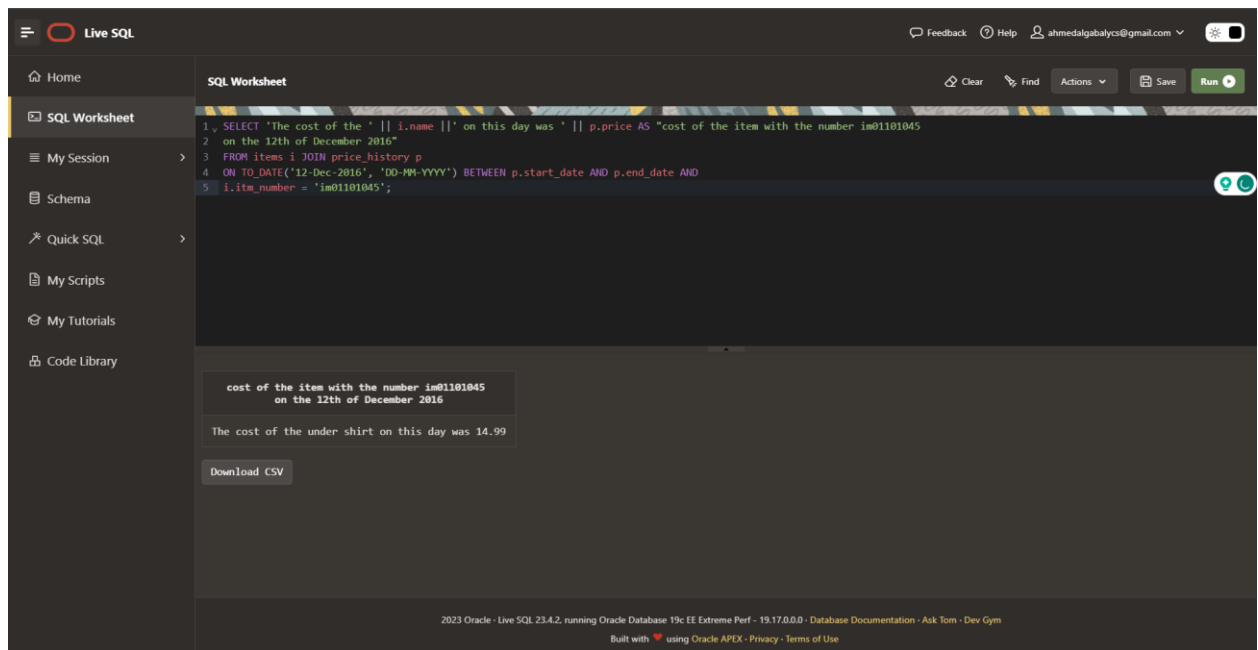
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Part 6: Retrieving Records with Nonequijoins

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



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.

SQL Worksheet

```

1, SELECT
2 c.first_name || ' ' || c.last_name AS "Rep",
3 s.first_name || ' ' || s.last_name AS "Supervisor"
4 FROM
5 customers c
6 JOIN
7 sales_representatives s
8 ON
9 c.sre_id = s.supervisor_id;

```

Rep	Supervisor
Robert Thornberry	Charles Raymond
Robert Thornberry	Victoria Wright
Robert Thornberry	Barry Speed
John Doe	Charles Raymond
John Doe	Victoria Wright
John Doe	Barry Speed

Download CSV
6 rows selected.

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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).

SQL Worksheet

```

1, SELECT
2 t.id, t.name, t.number_of_players, t.discount,
3 c.ctr_number, c.email, c.first_name, c.last_name, c.phone_number, c.current_balance, c.sre_id, c.tem_id,
4 c.loyalty_card_number
5 FROM
6 teams t
7 LEFT OUTER JOIN
8 customers c
9 ON
10 (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	LOY
t001	Rockets	25	10	c00001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
t002	Celtics	42	20	c00101	unknown@here.com	John	Doe	03216547808	987.5	sr01	t002	-
t003	Rovers	8	-	c01986	margal87@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-
t004	Jets	10	5	-	-	-	-	-	-	-	-	-

Download CSV
4 rows selected.

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

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

[illegible]