



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

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UTM Johor Bahru

SESSION 2023/2024 SEMESTER 1

SECD2523
DATABASE

LAB EXERCISE : SQL DML2

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SECTION
10

Section 6 Lesson 6 Exercise 1: Retrieving Data Using SELECT

Part 1: Retrieving all columns from a table.

Using the SELECT * statement show all data stored in the following tables:

1. customers

The screenshot shows the APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT *
2 FROM customers;
```

The results are displayed in a table with 9 columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, and LOYALTY_CARD_NUMBER. There are 6 rows of data.

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
c00001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
c00012	J.jones@freemail.com	Jennifer	Jones	01505214598	0	-	-	lc1015
c00101	unknown@here.com	John	Doe	03216547808	987.5	sr01	t002	-
c00103	MurciaA@globaltech.com	Andrew	Murcia	07715246890	85	-	-	lc2341
c01986	margal87@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-
c02001	brianrog@hootech.com	Brian	Rogers	01654564898	50	-	-	lc4587

6 rows returned in 0.04 seconds

2. teams

The screenshot shows the APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT *
2 FROM teams;
```

The results are displayed in a table with 4 columns: ID, NAME, NUMBER_OF_PLAYERS, and DISCOUNT. There are 4 rows of data.

ID	NAME	NUMBER_OF_PLAYERS	DISCOUNT
t004	Jets	10	5
t001	Rockets	25	10
t002	Celtics	42	20
t003	Rovers	8	-

4 rows returned in 0.02 seconds

3. items

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT *
2 FROM items;
3
```

The results are displayed in a table with 7 columns: ITM_NUMBER, NAME, DESCRIPTION, CATEGORY, COLOR, Size, and ILT_ID. There are 5 rows returned.

ITM_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	Size	ILT_ID
im0101044	gloves	catcher mitt	clothing	brown	m	il010230124
im0101045	under shirt	top worn under the game top	clothing	white	s	il010230125
im0101046	socks	team socks with emblem	clothing	range	l	il010230126
im0101047	game top	team shirt with emblem	clothing	range	m	il010230127
im0101048	premium bat	high quality baseball bat	equipment	-	-	il010230128

Part 2: Selecting Specific Columns

1. Display the customer number, first name, last name, email and phone number of the customers.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT ctr_number, first_name, last_name, email, phone_number
2 FROM customers;
```

The results are displayed in a table with 5 columns: CTR_NUMBER, FIRST_NAME, LAST_NAME, EMAIL, and PHONE_NUMBER. There are 6 rows returned.

CTR_NUMBER	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER
c00001	Robert	Thornberry	bob.thornberry@heatmail.com	01234567898
c00012	Jennifer	Jones	Jjones@freemail.com	01505214598
c00101	John	Doe	unknown@here.com	03216547808
c00103	Andrew	Murcia	MurciaA@globaltech.com	07715246890
c01986	Maria	Galant	margal87@delphiview.com	01442736589
c02001	Brian	Rogers	brianrog@hootech.com	01654564898

2. Display the name and number of players for each team.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT name, number_of_players
2 FROM teams;
```

The results are displayed in a table with two columns: NAME and NUMBER_OF_PLAYERS.

NAME	NUMBER_OF_PLAYERS
Jets	10
Rockets	25
Celtics	42
Rovers	8

4 rows returned in 0.02 seconds. The interface also shows the schema WKSP_SQLAISA and the user Nuraisha Salsabila.

3. Display the name, description and category for every item in the table.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT name, description, category
2 FROM items;
```

The results are displayed in a table with three columns: NAME, DESCRIPTION, and CATEGORY.

NAME	DESCRIPTION	CATEGORY
gloves	catcher mitt	clothing
under shirt	top worn under the game top	clothing
socks	team socks with emblem	clothing
game top	team shirt with emblem	clothing
premium bat	high quaity basball bat	equipment

5 rows returned in 0.01 seconds. The interface also shows the schema WKSP_SQLAISA and the user Nuraisha Salsabila.

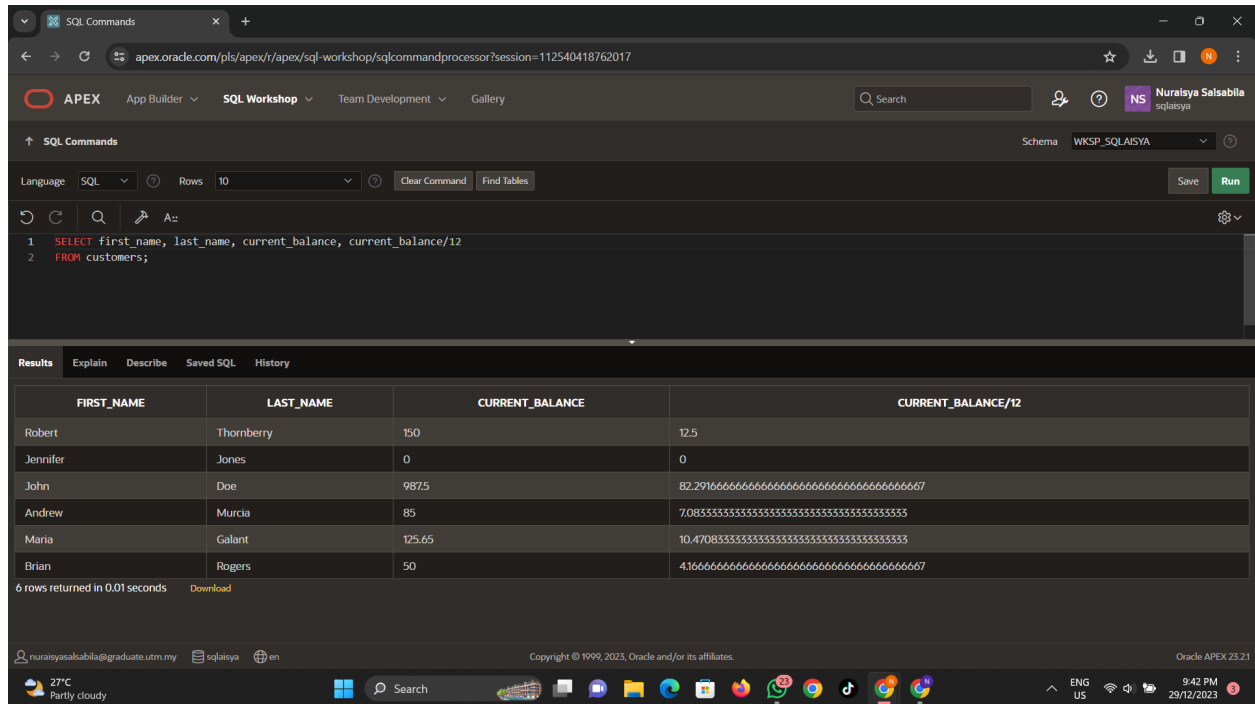
Section 6 Lesson 6 Exercise 2: Retrieving Data Using SELECT

Part 1: Using Arithmetic Operators

1. Every customer has been told they can pay off their current balance over a 12 month period.

Display the

customer's first name, last name, current balance and monthly payment.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT first_name, last_name, current_balance, current_balance/12
2 FROM customers;
```

The results are displayed in a table with the following columns: FIRST_NAME, LAST_NAME, CURRENT_BALANCE, and CURRENT_BALANCE/12. The table contains 6 rows of data.

FIRST_NAME	LAST_NAME	CURRENT_BALANCE	CURRENT_BALANCE/12
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.291666666666666666666666666667
Andrew	Murcia	85	7.0833333333333333333333333333333
Maria	Galanit	125.65	10.4708333333333333333333333333333
Brian	Rogers	50	4.1666666666666666666666666666667

6 rows returned in 0.01 seconds

2. Obl is considering giving a gift card to all its customers of 5.00 that can be used to reduce their current balance.

Write a query that will show the customers first name, last name, customer number, current balance and the

value of their balance minus the gift value.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT first_name, last_name, ctr_number, current_balance, current_balance-5.00
2 FROM customers;
```

The results are displayed in a table with 5 columns: FIRST_NAME, LAST_NAME, CTR_NUMBER, CURRENT_BALANCE, and CURRENT_BALANCE-5.00. There are 6 rows of data.

FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE	CURRENT_BALANCE-5.00
Robert	Thornberry	c00001	150	145
Jennifer	Jones	c00012	0	-5
John	Doe	c00101	987.5	982.5
Andrew	Murcia	c00103	85	80
Maria	Galant	c01986	125.65	120.65
Brian	Rogers	c02001	50	45

6 rows returned in 0.01 seconds

3. What would be the problem with implementing this scheme?

The current balance can have a negative value.

Part 2 : Using Column Aliases

1. You previously wrote a query that display the customer's first name, last name, current balance and monthly payment. Rewrite the query to use First Name, Last Name, Balance and Monthly Repayments as the column aliases. The aliases are to be shown exactly as described (case sensitive).

2. Why does the last team not show a discount?

NAME	NUMBER_OF_PLAYERS	DISCOUNT
Jets	10	5
Rockets	25	10
Celtics	42	20
Rovers	8	-

Because the discount value of the last team is null.

Section 6 Lesson 7 Exercise 1: Restricting Data Using WHERE

Part 1: Using the WHERE Clause.

1. Using the unique customer number in the where clause display all columns for Maria Galant.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT *
2 FROM customers
3 WHERE ctr_number = 'c01986';
```

The results are displayed in a table with the following columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, and LOYALTY_CARD_NUMBER. The results show one row for Maria Galant with a current balance of 125.65.

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
c01986	margal87@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-

1 rows returned in 0.01 seconds

2. Display the first name, last name and customer number for all customers who have a current balance of greater than 100. Use an appropriate alias for your column headings.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT first_name AS "FIRST NAME", last_name AS "LAST NAME", ctr_number AS "CUSTOMER NUMBER"
2 FROM customers
3 WHERE current_balance > 100;
```

The results tab displays the following data:

FIRST NAME	LAST NAME	CUSTOMER NUMBER
Robert	Thornberry	c00001
John	Doe	c00101
Maria	Galant	c01986

3 rows returned in 0.01 seconds

3. Display the order id, date and time of all orders that were placed before the 28th of May 2019. Use an appropriate alias for your column headings.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT id AS "ORDER ID", odr_date AS "ORDER DATE", odr_time AS "ORDER TIME"
2 FROM orders
3 WHERE odr_date < TO_DATE('28-MAY-2019', 'dd-mon-yyyy');
```

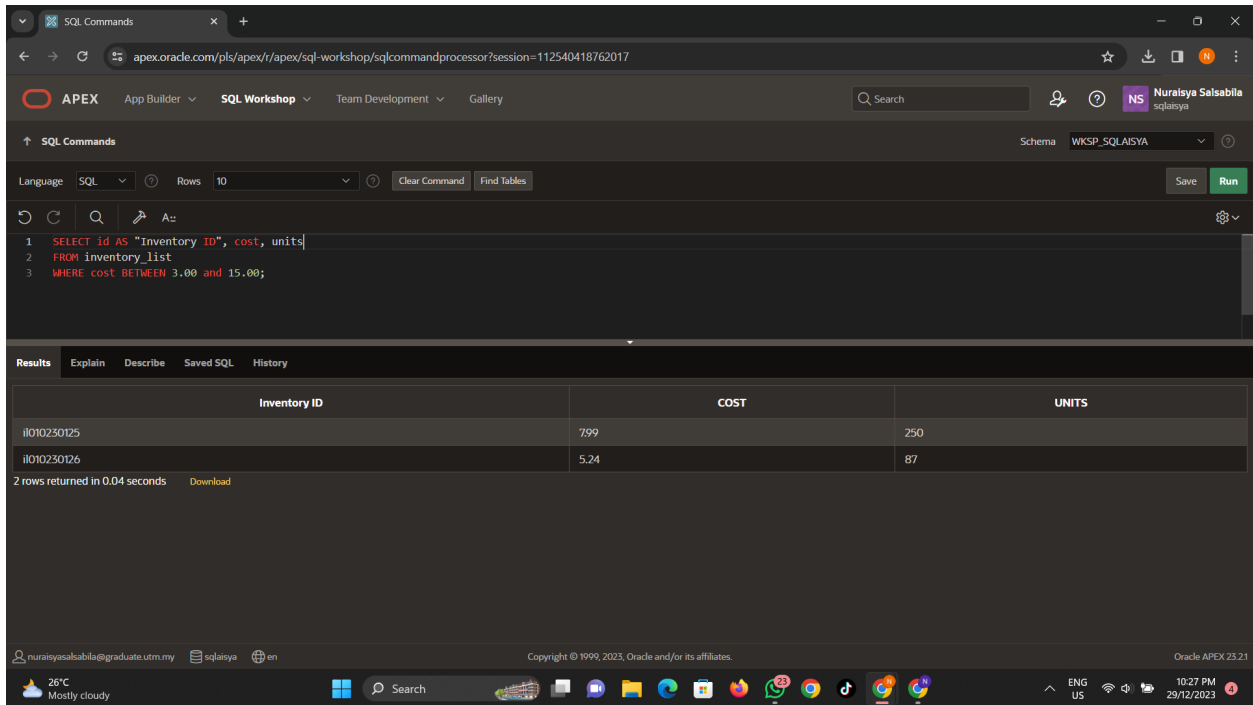
The results tab displays the following data:

ORDER ID	ORDER DATE	ORDER TIME
or0101250	04/11/2017	04/11/2017
or0101350	05/24/2017	05/24/2017
or0101425	05/28/2017	05/28/2017
or0101681	06/02/2017	06/02/2017
or0101750	06/18/2017	06/18/2017

5 rows returned in 0.03 seconds

Part 2: Range Conditions: BETWEEN Operator

1. Display the inventory id, cost and number of units using appropriate aliases for all items that have a trade cost of between 3.00 and 15.00.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT id AS "Inventory ID", cost, units
2 FROM inventory_list
3 WHERE cost BETWEEN 3.00 and 15.00;
```

The results are displayed in a table with the following data:

Inventory ID	COST	UNITS
il010230125	7.99	250
il010230126	5.24	87

2 rows returned in 0.04 seconds. Download

Part 3: Membership Conditions: IN Operator

1. Display the inventory id, cost and number of units using appropriate aliases for all items that have 50, 100, 150 or 200 units in stock.

SQL Commands

apex.oracle.com/pls/apex/r/apex/sql-workshop/sqlcommandprocessor?session=112540418762017

APEX App Builder SQL Workshop Team Development Gallery

Search

Schema WKSP_SQLAISA

Language SQL Rows 10 Clear Command Find Tables Save Run

```
1 SELECT id AS "Inventory ID", cost, units
2 FROM inventory_list
3 WHERE units IN (50, 100, 150, 200);
```

Results Explain Describe Saved SQL History

Inventory ID	COST	UNITS
il010230124	2.5	100

1 rows returned in 0.03 seconds Download

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Part 4: Membership Conditions: NOT IN Operator

1. Display the inventory id, cost and number of units using appropriate aliases for all items that do not have 50, 100, 150 or 200 units in stock.

SQL Commands

apex.oracle.com/pls/apex/r/apex/sql-workshop/sqlcommandprocessor?session=112540418762017

APEX App Builder SQL Workshop Team Development Gallery

Search

Schema WKSP_SQLAISA

Language SQL Rows 10 Clear Command Find Tables Save Run

```
1 SELECT id AS "Inventory ID", cost, units
2 FROM inventory_list
3 WHERE units NOT IN (50, 100, 150, 200);
```

Results Explain Describe Saved SQL History

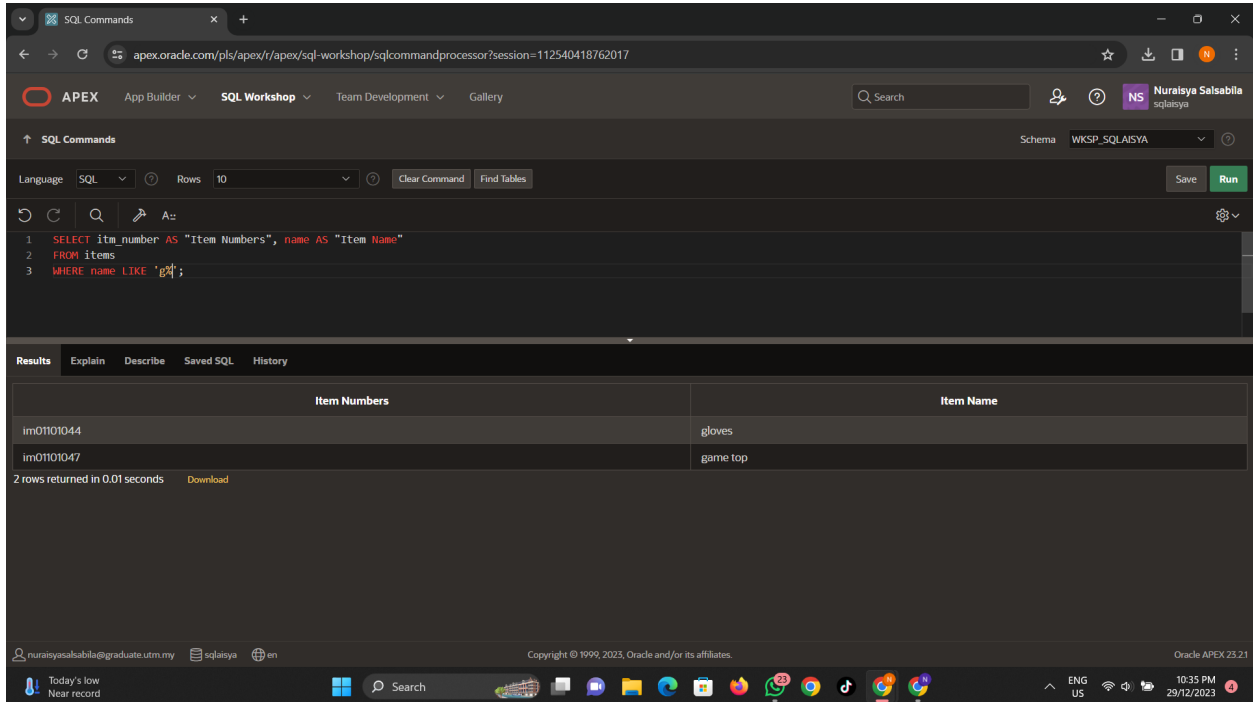
Inventory ID	COST	UNITS
il010230125	7.99	250
il010230126	5.24	87
il010230127	18.95	65
il010230128	97.46	8

4 rows returned in 0.01 seconds Download

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Part 5: Pattern Matching: LIKE Operator

1. Display item number and name of all items that have a name that begins with g. Use an appropriate alias for your column headings.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT item_number AS "Item Numbers", name AS "Item Name"
2 FROM items
3 WHERE name LIKE 'g%';
```

The results are displayed in a table with two columns: "Item Numbers" and "Item Name".

Item Numbers	Item Name
im01101044	gloves
im01101047	game top

2 rows returned in 0.01 seconds. Download

Part 6 : Pattern Matching: Combining Wildcard Characters with the LIKE Operator

1. Display item number and name of all items that have a name that contain a lowercase o. Use an appropriate alias for your column headings.

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The user is logged in as 'Nuraisyya Salsabila' with the username 'sqlaiyya'. The 'SQL Commands' tab is active, showing a query in the 'SQL' language with 10 rows. The query is:

```
1 SELECT itm_number AS "Item Numbers", name AS "Item Name"
2 FROM items
3 WHERE name LIKE '%o%';
```

The 'Results' tab is selected, displaying a table with two columns: 'Item Numbers' and 'Item Name'. The table contains three rows of data:

Item Numbers	Item Name
im0101044	gloves
im0101046	socks
im0101047	game top

Below the table, it states '3 rows returned in 0.01 seconds' and provides a 'Download' link. The bottom status bar shows the user's email 'nuraisyysalsabila@graduate.uttm.my', the schema 'sqlaiyya', and the Oracle APEX version '23.2.1'. The system clock indicates 10:38 PM on 29/12/2023.

Section 6 Lesson 7 Exercise 2: Restricting Data Using WHERE

Part 1: Using the NULL Conditions

1. Write a query that will display information for teams that don't receive a discount in the following format:

The Rovers team has 25 players and does not receive a discount.

Use Team Information as the column alias.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and does not receive a discount' AS "Team Information"
2 FROM teams
3 WHERE discount IS NULL;
```

The results tab shows one row of data:

Team Information
The Rovers team has 8 players and does not receive a discount

1 rows returned in 0.01 seconds

2. Write a query that will display information for only teams that receive a discount in the following format:

The Rockets team has 25 players and receives a discount of 10 percent.

Use Team Information as the column alias.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and receive a discount of ' || discount || ' percent' AS "Team Information"
2 FROM teams
3 WHERE discount IS NOT NULL;
```

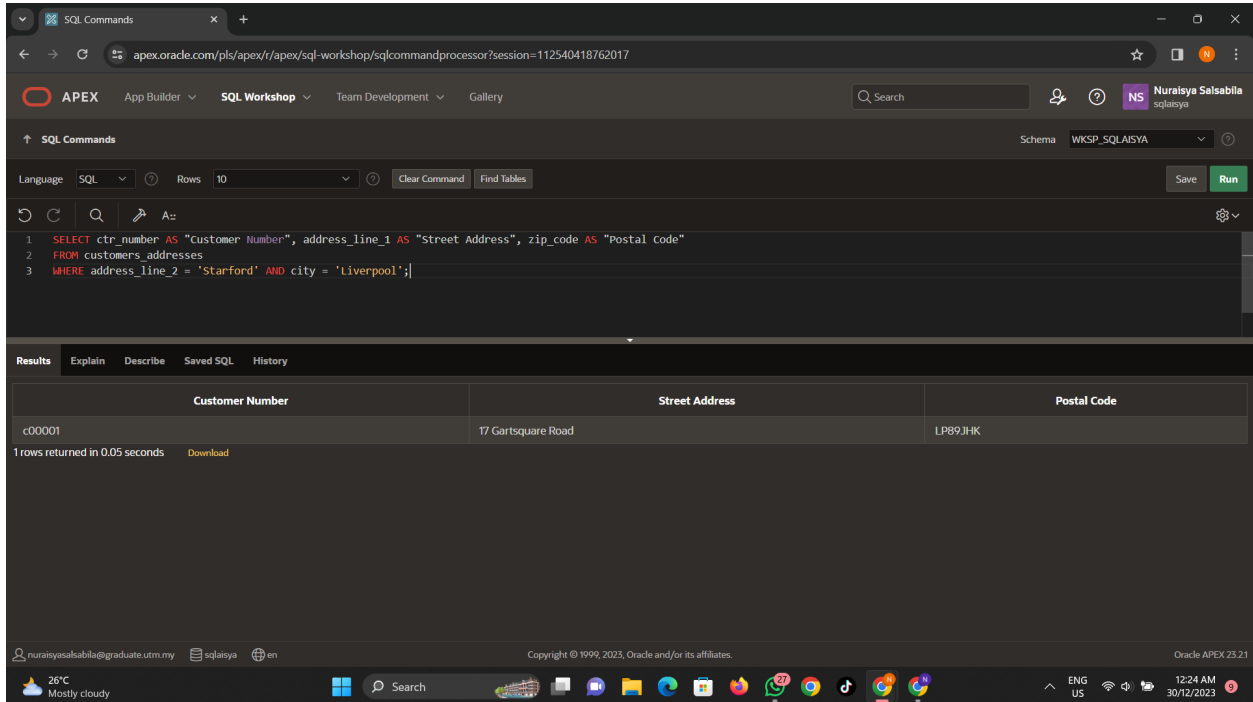
The results tab shows three rows of data:

Team Information
The Jets team has 10 players and receive a discount of 5 percent
The Rockets team has 25 players and receive a discount of 10 percent
The Celtics team has 42 players and receive a discount of 20 percent

3 rows returned in 0.03 seconds

Part 2: Logical Operators: AND

1. Write a query that will display the customer number, address line 1 and postal code for customers that live in the starford area of Liverpool. Use Customer Number, Street Address and Postal Code as the column aliases.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command area contains the following query:

```
1 SELECT ctr_number AS "Customer Number", address_line_1 AS "Street Address", zip_code AS "Postal Code"
2 FROM customers_addresses
3 WHERE address_line_2 = 'Starford' AND city = 'Liverpool';
```

The Results tab shows the following data:

Customer Number	Street Address	Postal Code
c00001	T7 Gartsquare Road	LP89JH-K

1 rows returned in 0.05 seconds

Part 3: Logical Operators: OR

1. Write a query that will display the customer number, address line 1 and postal code for customers that live in either starford or Liverpool in general. Use Customer Number, Street Address and Postal Code as the column Aliases.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT ctr_number AS "Customer Number", address_line_1 AS "Street Address", zip_code AS "Postal Code"
2 FROM customers_addresses
3 WHERE address_line_2 = 'Starford' OR city = 'Liverpool';
```

The results tab shows the following data:

Customer Number	Street Address	Postal Code
c00001	63 Acacia Drive	LP83JH-R
c00001	T7 Gartsquare Road	LP89JH-K

2 rows returned in 0.01 seconds

Part 4: Logical Operators: NOT Equal To

1. Write a query that will display the customer number, address line 1 and postal code for customers that do not live in Liverpool. Use Customer Number, Street Address and Postal Code as the column aliases.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT ctr_number AS "Customer Number", address_line_1 AS "Street Address", zip_code AS "Postal Code"
2 FROM customers_addresses
3 WHERE city <> 'Liverpool';
```

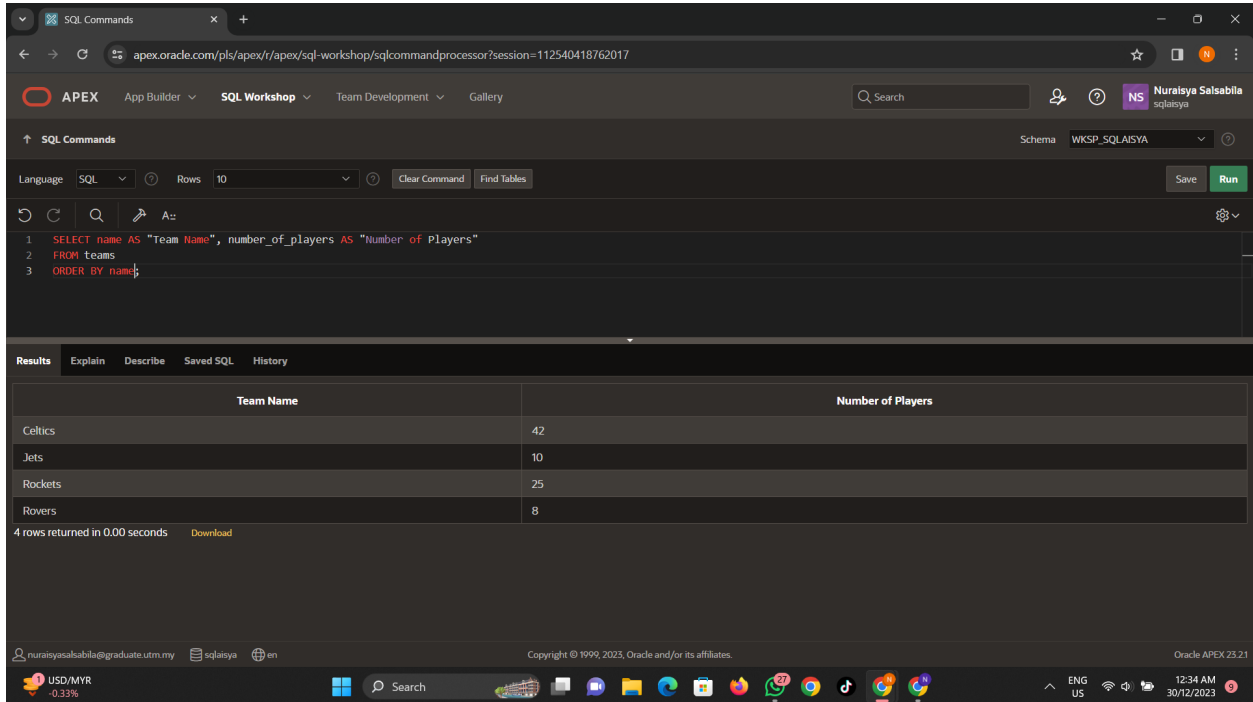
The results tab shows the following data:

Customer Number	Street Address	Postal Code
c00101	54 Ropehill Crescent	ST45AGV
c01986	36 Watercress Lane	JP25YTH

2 rows returned in 0.03 seconds

Section 6 Lesson 8 Exercise 1: Sorting Data Using ORDER BY

1. Display the team name and number of players alphabetically in order of team name. Use an appropriate alias for your column headings.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT name AS "Team Name", number_of_players AS "Number of Players"
2 FROM teams
3 ORDER BY name;
```

The results are displayed in a table with the following data:

Team Name	Number of Players
Celtics	42
Jets	10
Rockets	25
Rovers	8

4 rows returned in 0.00 seconds. The interface also shows the user 'Nuraisyya Salsabila' and the schema 'WKSP_SQLAISIYA'.

2. Display the team name and number of players in descending order of number of players. Use an appropriate alias for your column headings.

The screenshot shows the APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT name AS "Team Name", number_of_players AS "Number of Players"
2 FROM teams
3 ORDER BY number_of_players DESC;
```

The results are displayed in a table with the following data:

Team Name	Number of Players
Celtics	42
Rockets	25
Jets	10
Rovers	8

4 rows returned in 0.00 seconds

3. Display the team name and number of players alphabetically in order of team name. Use Team Name for the name alias and Players for the number of players. Sort the output in descending order of name using the alias in the ORDER BY clause.

The screenshot shows the APEX SQL Workshop interface. The SQL command entered is:

```
1 SELECT name AS "Team Name", number_of_players AS "Players"
2 FROM teams
3 ORDER BY name DESC;
```

The results are displayed in a table with the following data:

Team Name	Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

4 rows returned in 0.01 seconds

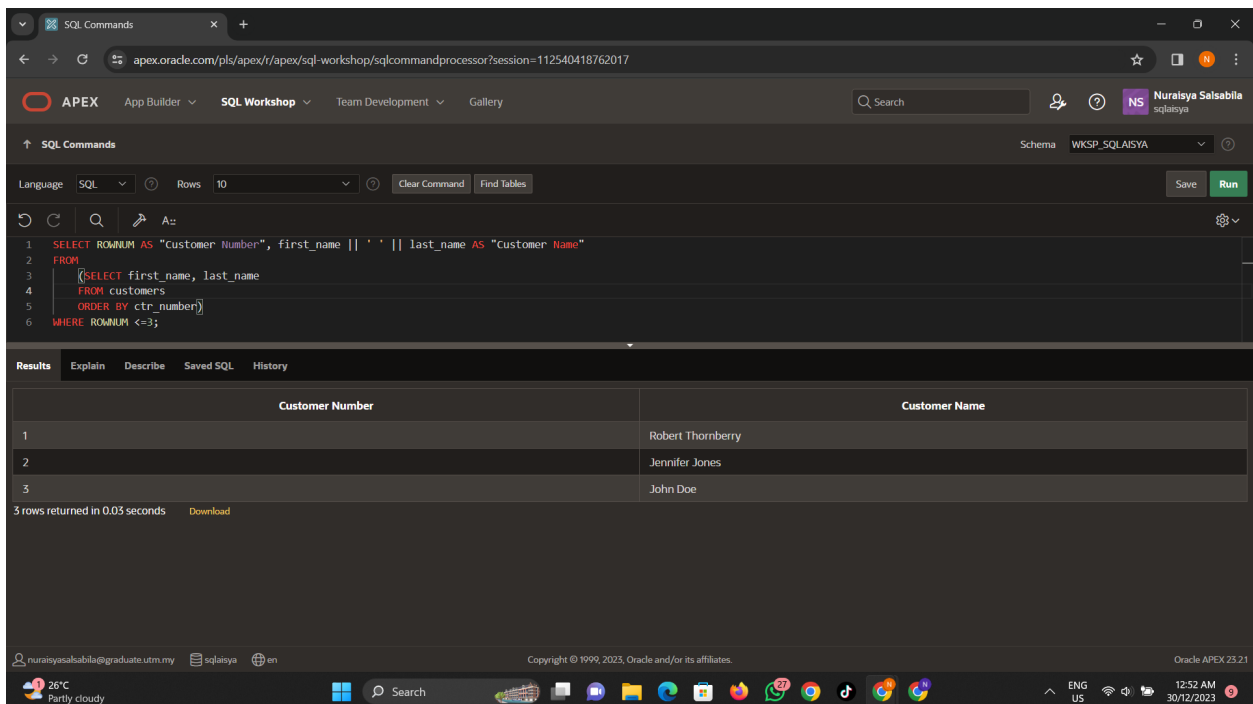
Section 6 Lesson 8 Exercise 2: Sorting Data Using ORDER BY

Part 1 : TOP-N-ANALYSIS (S6L8 Objective 3)

1. The customers are numbered sequentially with each new customer being assigned a higher customer number.

Use TOP-N-ANALYSIS to only show the First and last name of the first three customers. Show the customers first

and last name in the same column using Customer Name as the column alias.



The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

```
1 SELECT ROWNUM AS "Customer Number", first_name || ' ' || last_name AS "Customer Name"
2 FROM
3   (SELECT first_name, last_name
4    FROM customers
5    ORDER BY ctr_number)
6 WHERE ROWNUM <= 3;
```

The Results tab shows the following data:

Customer Number	Customer Name
1	Robert Thornberry
2	Jennifer Jones
3	John Doe

3 rows returned in 0.03 seconds

Part 2 : Using a Substitution Variable (S6L8 Objective 4)

1. Use a substitution variable that will allow you to enter the commission rate for the sales representatives. The

first and last names should be displayed to screen for any sales representatives that earn that commission rate

and the output should be ordered by their last name. Use an appropriate alias for your column headings.

Enter Bind Variables - Google Chrome

apex.oracle.com/pls/apex/?p=4500:138:112540418762017:-

Submit

Bind Variable	Value
:COMMISSION_RATE	5

26°C Partly cloudy

SQL Commands

apex.oracle.com/pls/apex/r/apex/sql-workshop/sqlcommandprocessor?session=112540418762017

APEX App Builder SQL Workshop Team Development Gallery

SQL Commands Schema WKSP_SQLAISIYA

Language SQL Rows 10 Clear Command Find Tables Save Run

```
1 SELECT first_name AS "First Name", last_name AS "Last Name"
2 FROM sales_representatives
3 WHERE commission_rate = :commission_rate
4 ORDER BY last_name;
```

Results Explain Describe Saved SQL History

First Name	Last Name
Barry	Speed
Victoria	Wright

2 rows returned in 0.05 seconds Download

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26°C Partly cloudy