



UTM DEGREE PROGRAMME

UNIVERSITI TEKNOLOGI MALAYSIA

Database

(SECD 2523)

Lab 3:DML 2 -Part 1

Name of Lecturer: Dr Noor Hidayah binti Zakaria

Name: Cheng See Chee

Matric number: A22EC0043

Section: 08

Section 6 Lesson 6 Exercise 1: Retrieving Data Using SELECT

Write and Execute SELECT statements (S6L6 Objective 2)

In this exercise you will retrieve data that is stored in the database system by using a SELECT statement.

Part 1: Retrieving all columns from a table.

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

1. customers.

The screenshot displays the Oracle APEX SQL Workshop interface. At the top, the navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'sc sc123' are on the right. Below the navigation bar, the 'SQL Commands' section shows a query:

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

 The 'Language' is set to 'SQL' and 'Rows' to '10'. Buttons for 'Clear Command', 'Find Tables', 'Save', and 'Run' are present. The 'Run' button has been clicked, and the 'Results' tab is active. 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. The table contains 6 rows of data. Below the table, it states '6 rows returned in 0.00 seconds' with a 'Download' link. The footer shows the user 'chengchee@graduate.utm.my', session 'sc123', and copyright information.

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
c02001	brianrog@hoootech.com	Brian	Rogers	01654564898	50	-	-	lc4587
c00001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
c00012	ljones@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	-

2. teams.

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

SC

sc123

SQL Commands

Schema WKSP_SC123

Language SQL

Rows 10

Clear Command

Find Tables

Save

Run

1

SELECT *

2

FROM teams;

3

Results

Explain

Describe

Saved SQL

History

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 secondsDownload

chengchee@graduate.utm.my

sc123

en

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Oracle APEX 23.21

3. items

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

SC

sc123

SQL Commands

Schema WKSP_SC123

Language SQL

Rows 10

Clear Command

Find Tables

Save

Run

1

SELECT *

2

FROM items;

3

Results

Explain

Describe

Saved SQL

History

ITM_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	Size	ILT_ID
im01101044	gloves	catcher mitt	clothing	brown	m	il010230124
im01101045	under shirt	top worn under the game top	clothing	white	s	il010230125
im01101046	socks	team socks with emblem	clothing	range	l	il010230126
im01101047	game top	team shirt with emblem	clothing	range	m	il010230127
im01101048	premium bat	high quaiity baseball bat	equipment	-	-	il010230128

5 rows returned in 0.03 secondsDownload

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Oracle APEX 23.21

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;
3
4
```

The results are displayed in a table with 6 rows:

CTR_NUMBER	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER
c02001	Brian	Rogers	brianrog@hootech.com	01654564898
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

6 rows returned in 0.00 seconds

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;
3
4
```

The results are displayed in a table with 4 rows:

NAME	NUMBER_OF_PLAYERS
Jets	10
Rockets	25
Celtics	42
Rovers	8

4 rows returned in 0.01 seconds

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

The screenshot shows the Oracle APEX SQL Workshop interface. At the top, there's a navigation bar with 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile are on the right. Below this, the 'SQL Commands' section is active, showing a SQL query in the editor:

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

The 'Results' tab is selected, displaying a table with 5 rows. The table has three columns: NAME, DESCRIPTION, and CATEGORY. The data is as follows:

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 quaiity basball bat	equipment

Below the table, it says '5 rows returned in 0.01 seconds' with a 'Download' link. The footer shows the user 'chengchee@graduate.utm.my', workspace 'sc123', language 'en', and copyright information for Oracle APEX 23.21.



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UNIVERSITI TEKNOLOGI MALAYSIA

Database

(SECD 2523)

Lab 3:DML 2 -Part 2

Name of Lecturer: Dr Noor Hidayah binti Zakaria

Name: Cheng See Chee

Matric number: A22EC0043

Section: 08

Part 3: Using Literal Character Strings

1. Write a query that will display the team information 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 top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile are on the right. The 'SQL Commands' tab is active, showing a query in the editor:

```
1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and receives a discount of '
2 || discount || ' percent.' AS "Team Information"
3 FROM teams;
4
```

The 'Results' tab is selected, displaying the output of the query. The results are formatted as a table with the column alias 'Team Information'.

Team Information
The Jets team has 10 players and receives a discount of 5 percent.
The Rockets team has 25 players and receives a discount of 10 percent.
The Celtics team has 42 players and receives a discount of 20 percent.
The Rovers team has 8 players and receives a discount of percent.

Below the table, it states '4 rows returned in 0.01 seconds' with a 'Download' link. The footer shows the user 'chengchee@graduate.utm.my', schema 'sc123', and Oracle APEX 23.21.

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

Because it contains zero value, so it does not get any discount



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UNIVERSITI TEKNOLOGI MALAYSIA

Database

(SECD 2523)

Lab 3:DML 2 -Part 3

Name of Lecturer: Dr Noor Hidayah binti Zakaria

Name: Cheng See Chee

Matric number: A22EC0043

Section: 08

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 Commands pane contains the following query:

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

The Results pane shows the query results in a table format:

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 0.03 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 Commands pane contains the following query:

```
1 SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance"
2 FROM customers
3 WHERE current_balance > 100;
```

The Results pane shows the query results in a table format:

First Name	Last Name	Balance
Robert	Thornberry	150
John	Doe	987.5
Maria	Galant	125.65

3 rows returned in 0.00 seconds

- 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 area contains the following query:

```
1 SELECT id AS "Order ID",
2    odr_date AS "Date",
3    TO_CHAR(odr_time, 'HH24:MI:SS') AS "Order Time"
4 FROM orders
5 WHERE odr_date < TO_DATE('2019-05-28', 'YYYY-MM-DD');
```

The Results tab shows the following data:

Order ID	Date	Order Time
or0101250	04/17/2017	08:32:30
or0101350	05/24/2017	10:30:35
or0101425	05/28/2017	12:30:00
or0101681	06/02/2017	14:55:30
or0101750	06/18/2017	09:05:00

5 rows returned in 0.03 seconds

Part 2: Range Conditions: BETWEEN Operator

- 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 area contains the following query:

```
1 SELECT id AS "Inventory ID",
2    cost,
3    units AS "Number of units"
4 FROM inventory_list
5 WHERE cost BETWEEN 3.00 AND 15.00;
```

The Results tab shows the following data:

Inventory ID	COST	Number of units
il010230125	7.99	250
il010230126	5.24	87

2 rows returned in 0.03 seconds

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.

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

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

The results tab shows one row returned:

Inventory ID	COST	Number of units
il010230124	2.5	100

1 rows returned in 0.01 seconds

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.

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

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

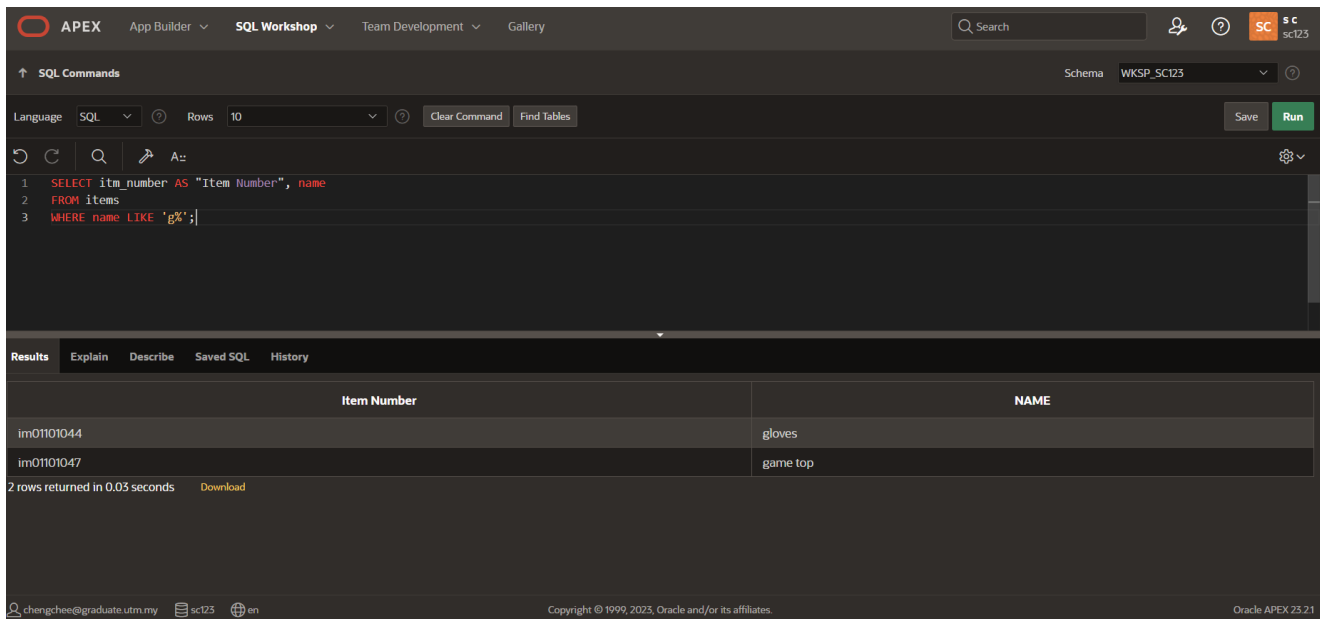
The results tab shows four rows returned:

Inventory ID	COST	Number of units
il010230125	799	250
il010230126	5.24	87
il010230127	18.95	65
il010230128	97.46	8

4 rows returned in 0.03 seconds

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 area contains the following query:

```
1 SELECT itm_number AS "Item Number", name
2 FROM items
3 WHERE name LIKE 'g%';
```

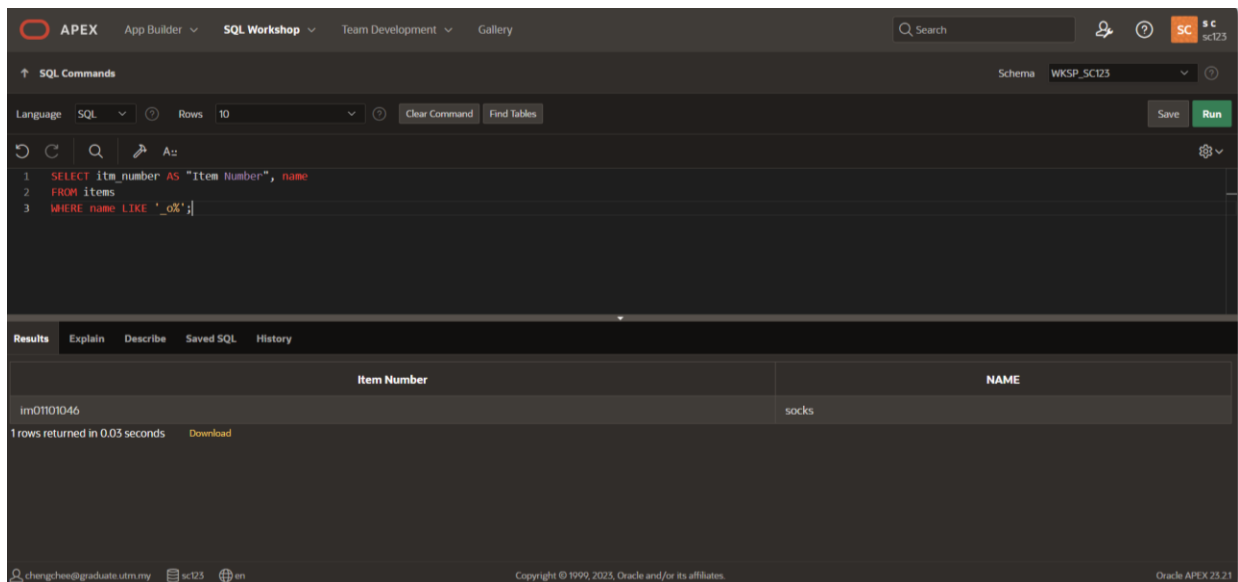
The results tab displays the following data:

Item Number	NAME
im01101044	gloves
im01101047	game top

2 rows returned in 0.03 seconds

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 SQL command area contains the following query:

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

The results tab displays the following data:

Item Number	NAME
im01101046	socks

1 rows returned in 0.03 seconds



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(SECD 2523)

Lab 3:DML 2 -Part 4

Name of Lecturer: Dr Noor Hidayah binti Zakaria

Name: Cheng See Chee

Matric number: A22EC0043

Section: 08

Section 6 Lesson 7 Exercise 2: Restricting Data Using WHERE

Limit rows using WHERE (S6L7 Objective 1)

In this exercise you will refine the data that is returned in your query by adding a WHERE clause to your SELECT statement.

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 APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile are on the right. The 'SQL Commands' tab is active, showing a query with four lines: a SELECT statement with a concatenation of 'The', team name, ' team has ', number of players, ' players and does not receive a discount.', an AS clause with the alias 'Team Information', a FROM clause with 'teams', and a WHERE clause with 'discount IS NULL;'. The 'Results' tab is selected, displaying the output: 'TheRovers team has 8 players and does not receive a discount.' Below the output, it says '1 rows returned in 0.03 seconds' and provides a 'Download' link. The footer shows the user 'chengchee@graduate.utm.my', the schema 'sc123', and copyright information for Oracle APEX 23.21.

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

Team Information

TheRovers team has 8 players and does not receive a discount.

1 rows returned in 0.03 seconds [Download](#)

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.

APEX App Builder SQL Workshop Team Development Gallery

Schema WKSP_SC123

Language SQL Rows 10 Clear Command Find Tables Save Run

```

1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and receives a discount of 10
2 percent.' AS "Team Information"
3 FROM teams
4 WHERE discount IS NOT NULL;

```

Results Explain Describe Saved SQL History

Team Information

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

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

The Celtics team has 42 players and receives a discount of 10 percent.

3 rows returned in 0.01 seconds Download

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Part 2: Logical Operators: AND

- 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.

APEX App Builder SQL Workshop Team Development Gallery

Schema WKSP_SC123

Language SQL Rows 10 Clear Command Find Tables Save Run

```

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' AND address_line_2 = 'Starford';

```

Results Explain Describe Saved SQL History

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK

1 rows returned in 0.04 seconds Download

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Part 3: Logical Operators: OR

- 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.

APEX App Builder SQL Workshop Team Development Gallery

Schema WKSP_SC123

Language SQL Rows 10 Clear Command Find Tables Save Run

```

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' OR address_line_2 = 'Starford';

```

Results Explain Describe Saved SQL History

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK
c00001	63 Acacia Drive	LP83JHR

2 rows returned in 0.03 seconds Download

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Part 4: Logical Operators: NOT Equal To

- 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.

APEX App Builder SQL Workshop Team Development Gallery

Schema WKSP_SC123

Language SQL Rows 10 Clear Command Find Tables Save Run

```

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 NOT IN ('Liverpool');

```

Results Explain Describe Saved SQL History

Customer Number	Street Address	Postal Code
c00101	54 Ropehill Crescent	ST45AGV
c01986	36 Watercress Lane	JP23YTH

2 rows returned in 0.01 seconds Download

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UNIVERSITI TEKNOLOGI MALAYSIA

Database

(SECD 2523)

Lab 3:DML 2 -Part 5

Name of Lecturer: Dr Noor Hidayah binti Zakaria

Name: Cheng See Chee

Matric number: A22EC0043

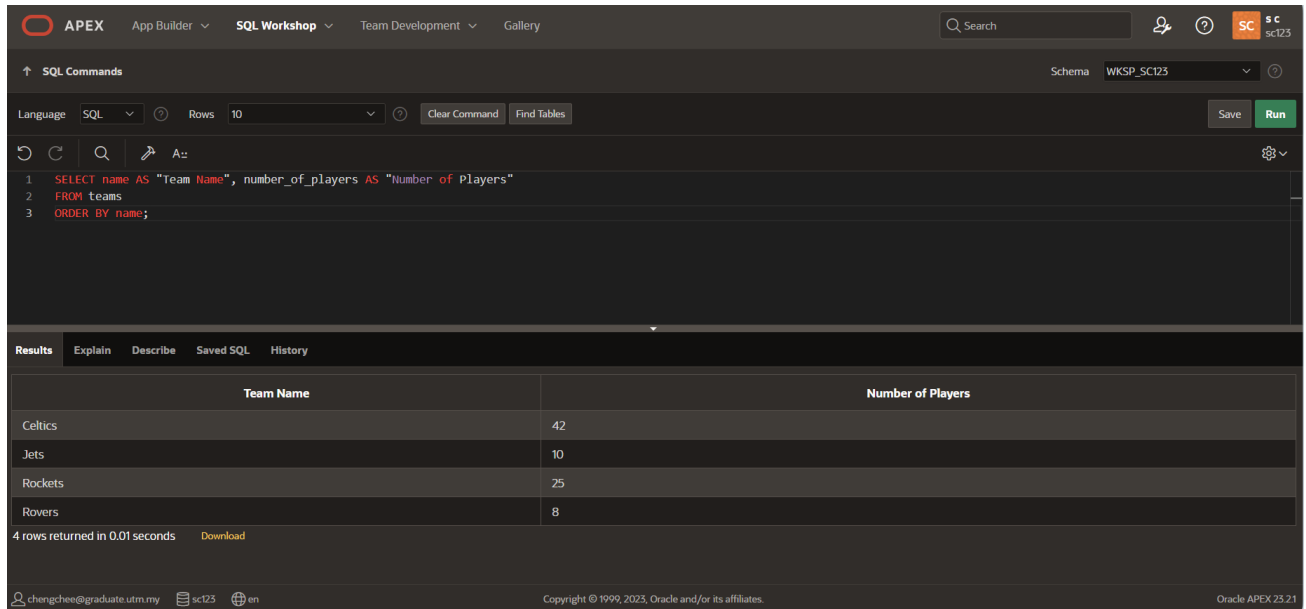
Section: 08

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

Use the ORDER BY Clause to Sort SQL Results (S6L8 Objective 1)

In this exercise you will sort the order of the data that is returned in your query by adding an ORDER BY clause to the end of your SELECT statement.

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 APEX SQL Workshop interface. The SQL Commands pane contains the following query:

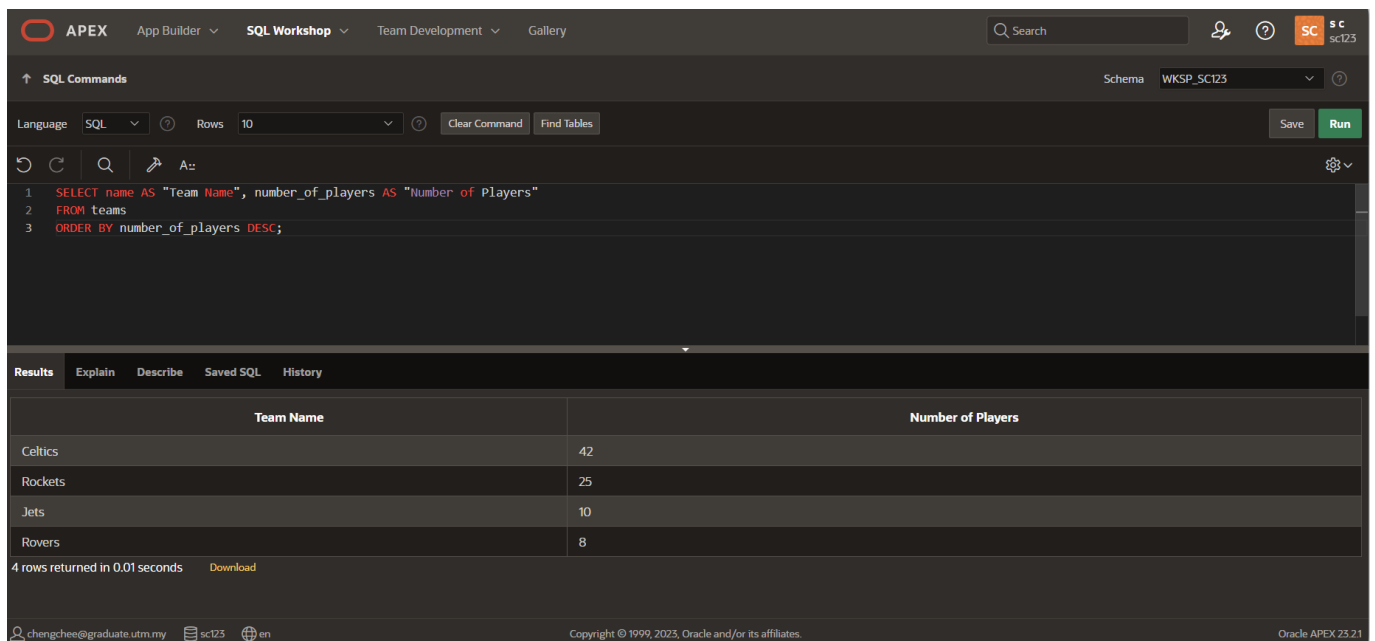
```
1 SELECT name AS "Team Name", number_of_players AS "Number of Players"
2 FROM teams
3 ORDER BY name;
```

The Results pane shows the output of the query, sorted alphabetically by team name:

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

4 rows returned in 0.01 seconds

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 Commands pane contains the following query:

```
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 pane shows the output of the query, sorted in descending order of number of players:

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

4 rows returned in 0.01 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.

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

SC

sc123

SQL Commands

SchemaWKSP_SC123

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

A::

1SELECT name AS "Team Name", number_of_players AS "Number of Players"

2FROM teams

3ORDER BY "Team Name" DESC;

Results

Explain

Describe

Saved SQL

History

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

4 rows returned in 0.01 seconds

Download

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sc123

en

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Lab 3:DML 2 -Part 6

Name of Lecturer: Dr Noor Hidayah binti Zakaria

Name: Cheng See Chee

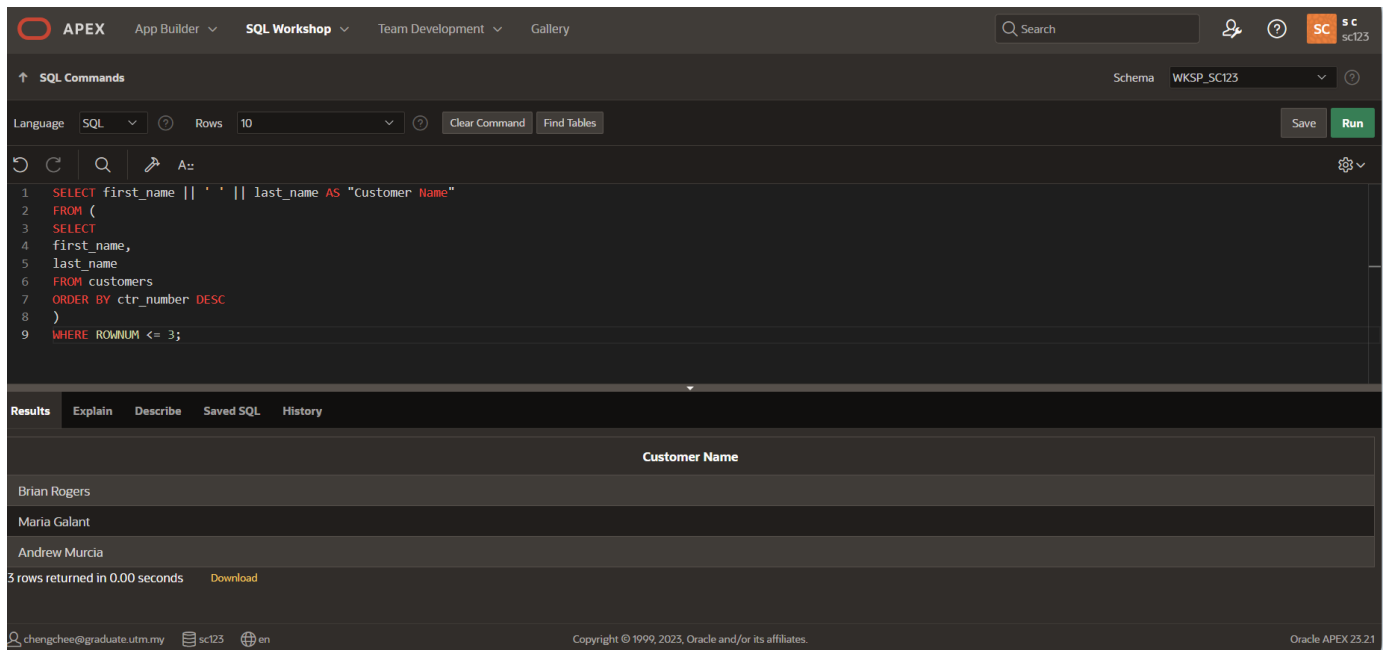
Matric number: A22EC0043

Section: 08

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

Part 1 : TOP-N-ANALYSIS (\$6L8 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 Oracle APEX SQL Workshop interface. The SQL Commands tab is active, displaying a query that selects the first and last names of the top 3 customers, concatenated into a single column named 'Customer Name'. The query is as follows:

```
1 SELECT first_name || ' ' || last_name AS "Customer Name"
2 FROM (
3 SELECT
4 first_name,
5 last_name
6 FROM customers
7 ORDER BY ctr_number DESC
8 )
9 WHERE ROWNUM <= 3;
```

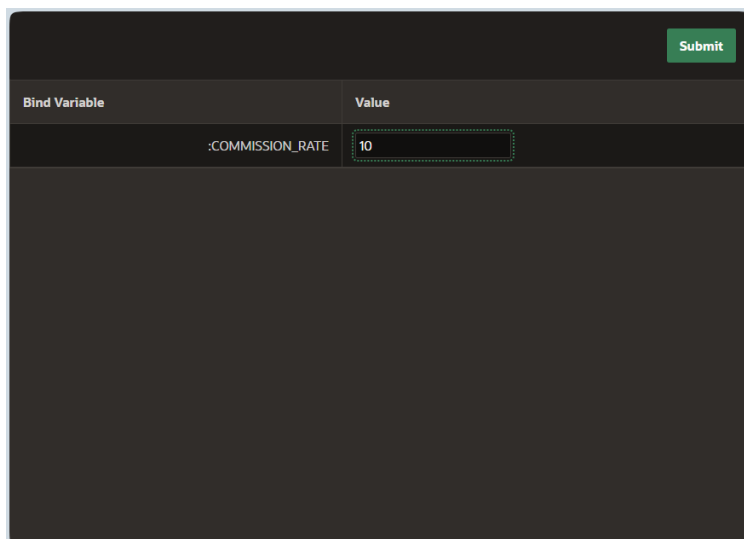
The Results tab shows the output of the query, which is a table with one column, 'Customer Name', containing three rows of data:

Customer Name
Brian Rogers
Maria Galant
Andrew Murcia

Below the table, it indicates '3 rows returned in 0.00 seconds' and provides a 'Download' link. The footer of the interface shows the user 'chengchee@graduate.utrm.my', the schema 'sc123', and the version 'Oracle APEX 23.1'.

Part 2 : Using a Substitution Variable (\$6L8 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.



The screenshot shows a form for binding a substitution variable. The form has a 'Submit' button in the top right corner. Below the button is a table with two columns: 'Bind Variable' and 'Value'.

Bind Variable	Value
:COMMISSION_RATE	10

The 'Value' field for ':COMMISSION_RATE' is a text input box containing the number '10'.

APEXApp BuilderSQL WorkshopTeam DevelopmentGallery

SearchSCsc123

SQL CommandsSchemaWKSP_SC123

LanguageSQLRows10Clear CommandFind TablesSaveRun

1SELECT first_name AS "First Name", last_name AS "Last Name", commission_rate AS "Commision Rate"

2FROM sales_representatives

3WHERE commission_rate= :commission_rate

4ORDER BY last_name;

ResultsExplainDescribeSaved SQLHistory

First Name	Last Name	Commision Rate
Charles	Raymond	10

1 rows returned in 0.02 secondsDownload

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