



UTM

UNIVERSITI TEKNOLOGI MALAYSIA

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SUBJECT NAME : DATABASE

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TITLE : ORACLE SQL3-DML2 (PART 1- PART 6)

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SQL 3 - PART 1

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.

[SELECT * FROM customers;](#)

The screenshot shows the Oracle SQL Workshop interface. The command bar at the top has tabs for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The search bar contains 'Search'. On the right, there's a user icon for 'farishah Alias' and a schema dropdown set to 'WKSP_DATABASEBIINFO...'. Below the bar, the language is set to SQL, rows are set to 10, and there are buttons for Clear Command and Find Tables. The main area shows a code editor with the following SQL command:

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

Below the code editor is a results grid with the following columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEAM_ID, and LOYALTY_CARD_NUMBER. The data returned is:

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEAM_ID	LOYALTY_CARD_NUMBER
c0001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
c0002	Jjones@freemail.com	Jennifer	Jones	01505214598	0	-	-	lc1015
c00101	unknown@here.com	John	Doe	03716547808	987.5	sr01	t002	-
c00105	MurciaA@globaltech.com	Andrew	Murcia	07715246890	85	-	-	lc2541
c01986	margal87@delphiview.com	Maria	Galant	01442756589	125.65	sr03	t003	-
c02001	brianrog@hootech.com	Brian	Rogers	01654564898	50	-	-	lc4587

At the bottom left, it says '6 rows returned in 0.02 seconds' and 'Download'.

2. Teams.

[SELECT * FROM teams;](#)

The screenshot shows the Oracle SQL Workshop interface. The command bar at the top has tabs for APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. The search bar contains 'Search'. On the right, there's a 'Save' button. Below the bar, the language is set to SQL, rows are set to 10, and there are buttons for Clear Command and Find Tables. The main area shows a code editor with the following SQL command:

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

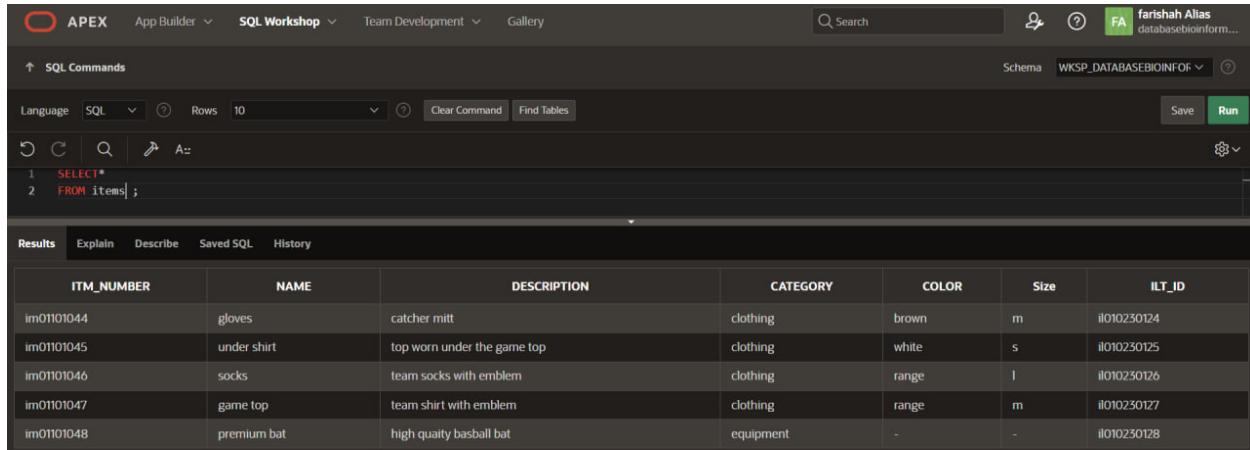
Below the code editor is a results grid with the following columns: ID, NAME, NUMBER_OF_PLAYERS, and DISCOUNT. The data returned is:

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

At the bottom left, it says '4 rows returned in 0.02 seconds' and 'Download'.

3. Items

[SELECT * FROM items;](#)



The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands pane, the following query is entered:

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

In the Results pane, the output is displayed as a table:

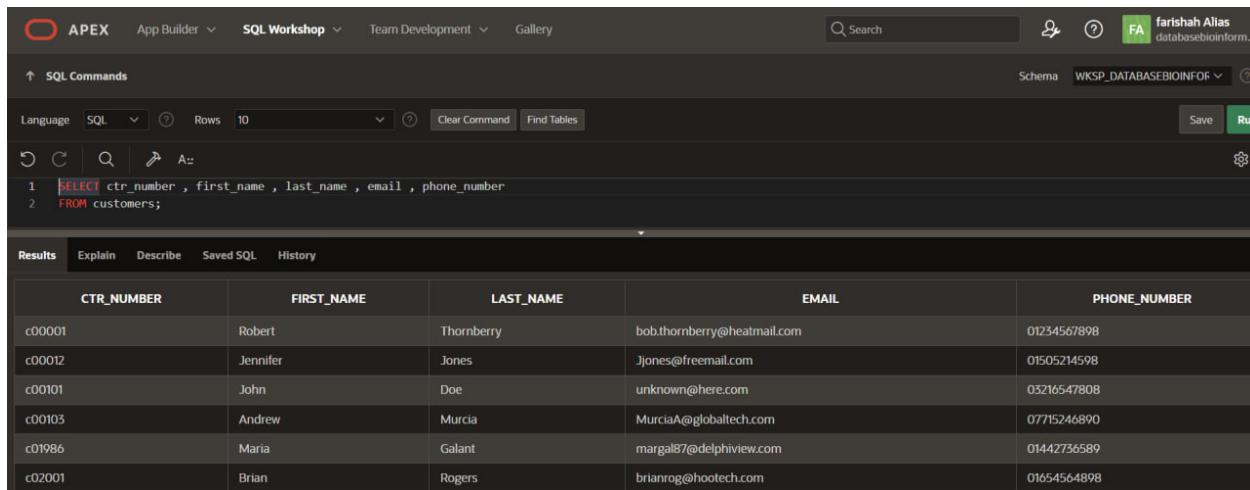
ITEM_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	SIZE	ILT_ID
im0101044	gloves	catcher mitt	clothing	brown	m	il010230124
im0101045	under shirt	top worn under the game top	clothing	white	s	il010230125
im0101046	socks	team socks with emblem	clothing	range	l	il010230126
im0101047	game top	team shirt with emblem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

Part 2: Selecting Specific Columns

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

[SELECT ctr_number , first_name , last_name , email , phone_number](#)

[FROM customers;](#)



The screenshot shows the Oracle SQL Workshop interface. In the SQL Commands pane, the following query is entered:

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

In the Results pane, the output is displayed as a table:

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	05216547808
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.

SELECT name , number_of_players

FROM teams;

The screenshot shows an SQL command window with the following details:

- Language: SQL
- Rows: 10
- SQL Command:

```
1 SELECT name, number_of_players
2 FROM teams;
```
- Results tab selected, showing the output:

NAME	NUMBER_OF_PLAYERS
Jets	10
Rockets	25
Celtics	42
Rovers	8

- Message: 4 rows returned in 0.01 seconds

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

SELECT name , description , category

FROM items;

The screenshot shows an SQL command window with the following details:

- Language: SQL
- Rows: 10
- SQL Command:

```
1 SELECT name , description , category
2 FROM items;
```
- Results tab selected, showing the output:

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 quality baseball bat	equipment

SQL 3 - PART 2

Section 6 Lesson 6 Exercise 2: 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: 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.

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

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.

```
SELECT first_name , last_name , ctr_number, current_balance, current_balance-5  
FROM customers;
```

The screenshot shows the Oracle SQL Workshop interface. At the top, there are tabs for APEX, App Builder, SQL Workshop, Team Development, and Gallery. The SQL Workshop tab is active. On the right, there's a search bar, user information for 'farishah Alias', and a help icon. Below the tabs, a navigation bar includes 'SQL Commands' with a back arrow, 'Schema' set to 'WKSP_DATABASEBIOINFO...', and buttons for 'Save' and 'Run'. The main area has a toolbar with icons for refresh, search, and other operations. A code editor window displays the following SQL query:

```
1 SELECT first_name , last_name , ctr_number, current_balance, current_balance-5
2 FROM customers;
```

Below the code editor, a results panel is open, showing the following table:

FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE	CURRENT_BALANCE-5
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

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

Current value is below 0

Part 2 : Using Column Aliases

1. You previously wrote a query that displayed 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).

```
SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS  
"Balance", current_balance/12 AS "Monthly Repayments"  
FROM customers;
```

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.

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

The screenshot shows a SQL query editor interface. At the top, there are buttons for Language (SQL), Rows (10), Clear Command, and Find Tables, along with a Save button. Below the toolbar, the SQL command is displayed:

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

Below the command, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing the output:

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.

4 rows returned in 0.00 seconds [Download](#)

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

The team did not show discount is because the discount value is a NULL. NULL is not equal to zero.

SQL 3 - PART 3

Section 6 Lesson 7 Exercise 1: Restricting Data Using WHERE Limit rows using WHERE (S6L7)

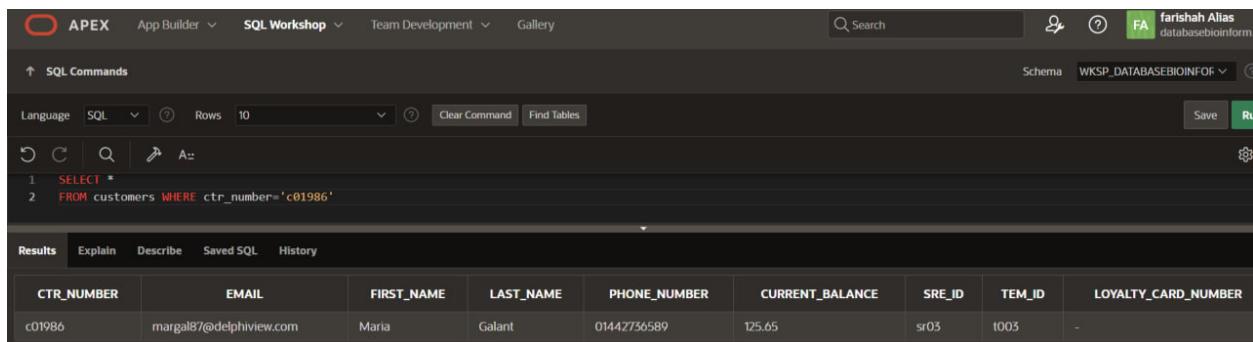
Objective 1) In this exercise you will refine the data that is returned in your query by adding a WHERE clause to your SELECT statement.

Part 1: Using the WHERE Clause.

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

`SELECT *`

`FROM customers WHERE ctr_number='c01986'`



The screenshot shows the Oracle SQL Workshop interface. The command window contains the following SQL code:

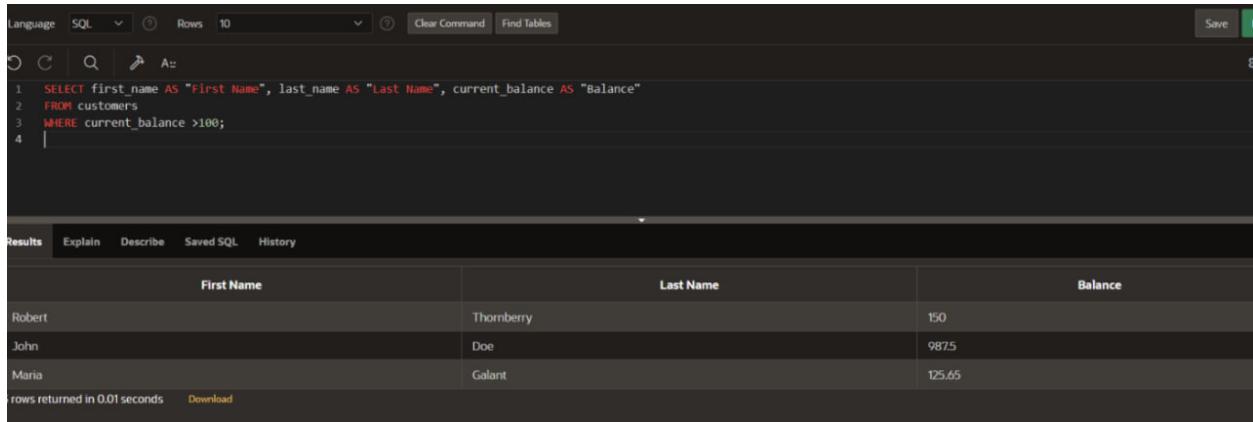
```
1 SELECT *
2 FROM customers WHERE ctr_number='c01986'
```

The results pane displays the following row:

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	sr05	t005	-

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.

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



The screenshot shows the Oracle SQL Workshop interface. The command window contains the following SQL code:

```
1 SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance"
2 FROM customers
3 WHERE current_balance >100;
4 |
```

The results pane displays the following rows:

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

rows returned in 0.01 seconds Download

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.

`SELECT id AS "Order ID", odr_date AS "Order Date", TO_CHAR (odr_time, 'HH24:MI:SS') AS "Order Time"`
`FROM orders WHERE odr_date < 05/28/2017' ;`

```

Language SQL Rows 10 Clear Command Find Tables
SELECT id AS "Order ID", odr_date AS "Order Date", TO_CHAR (odr_time, 'HH24:MI:SS') AS "Order Time"
FROM orders
WHERE odr_date < '05/28/2017';

```

Order ID	Order Date	Order Time
or0101250	04/17/2017	08:32:30
or0101350	05/24/2017	10:30:55

2 rows returned in 0.01 seconds [Download](#)

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.

```

SELECT id AS "Inventory ID" , cost AS "Cost" units AS "Number of Units in Stock"
FROM inventory_list
WHERE cost BETWEEN 3 AND 15;

```

```

Language SQL Rows 10 Clear Command Find Tables
SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units in Stock"
FROM inventory_list
WHERE cost BETWEEN 3 AND 15;

```

Inventory ID	Cost	Number of Units in Stock
il010230125	7.99	250
il010230126	5.24	87

part 3: Membership Conditions: IN Operator

- 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.

```

SELECT id AS "Inventory ID" , cost AS "Cost" units AS "Number of Units in Stock"
FROM inventory_list
WHERE units IN (50 , 100 , 150 , 200, 250);

```

```

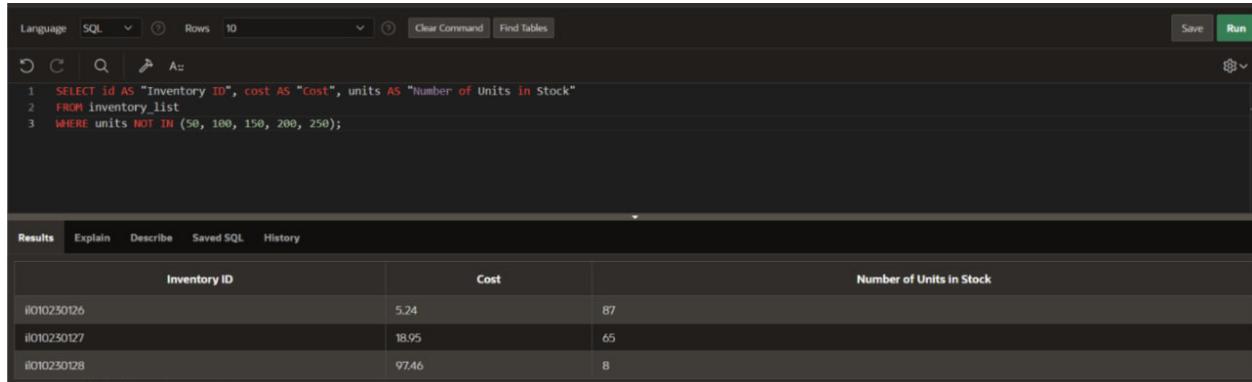
Language SQL Rows 10 Clear Command Find Tables
SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units in Stock"
FROM inventory_list
WHERE units IN (50 , 100 , 150 , 200, 250);

```

Inventory ID	Cost	Number of Units in Stock
il010230124	2.5	100
il010230125	7.99	250

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.

```
SELECT id AS "Inventory ID" , cost AS "Cost" units AS "Number of Units in Stock"  
FROM inventory_list  
WHERE units NOT IN (50 , 100 , 150 , 200 , 250);
```



The screenshot shows the SQL Workshop interface with the following details:

- Language: SQL
- Rows: 10
- Clear Command, Find Tables buttons
- Save, Run buttons
- SQL code:

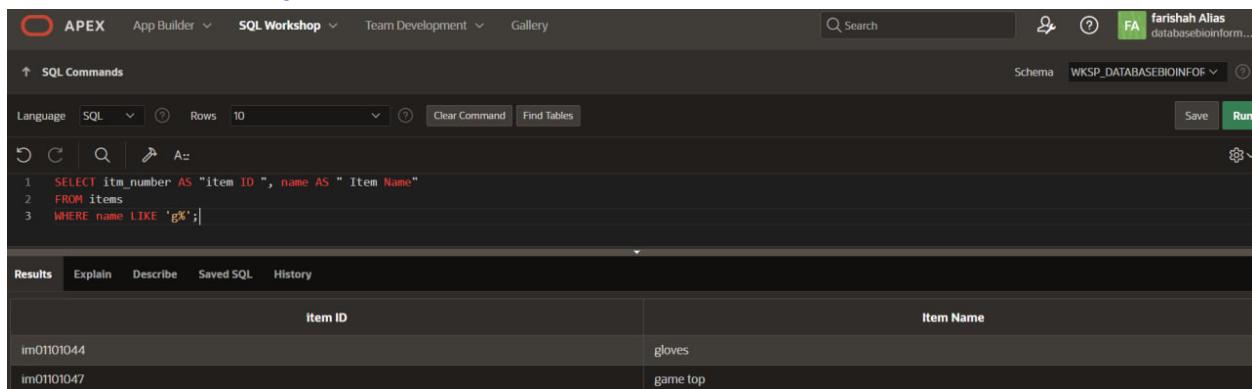
```
1 SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units in Stock"  
2 FROM inventory_list  
3 WHERE units NOT IN (50, 100, 150, 200, 250);
```
- Results tab selected
- Table output:

Inventory ID	Cost	Number of Units in Stock
i010230126	5.24	87
i010230127	18.95	65
i010230128	97.46	8

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.

```
SELECT itm_number AS "item ID ", name AS " Item Name"  
FROM items  
WHERE name LIKE 'g%';
```



The screenshot shows the SQL Workshop interface with the following details:

- Language: SQL
- Rows: 10
- Clear Command, Find Tables buttons
- Save, Run buttons
- SQL code:

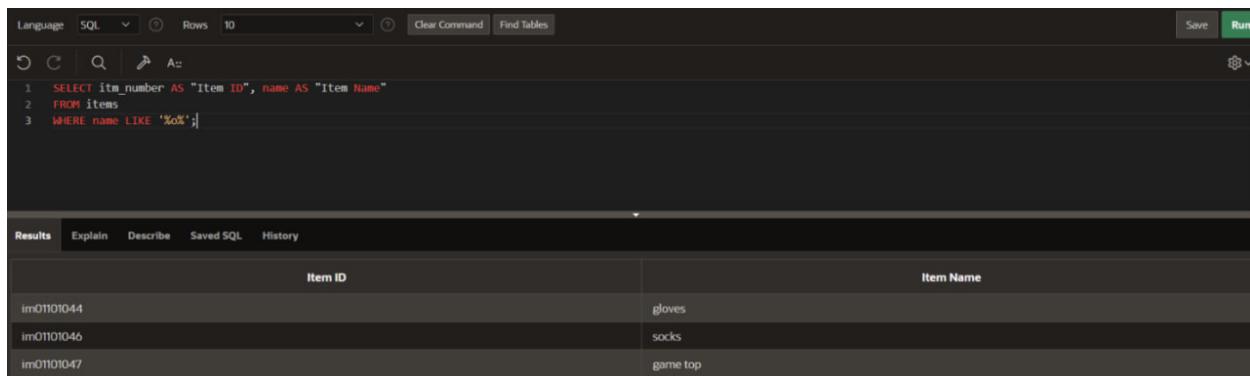
```
1 SELECT itm_number AS "item ID ", name AS " Item Name"  
2 FROM items  
3 WHERE name LIKE 'g%';
```
- Results tab selected
- Table output:

item ID	Item Name
im01101044	gloves
im01101047	game top

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.

```
SELECT item_number AS "item ID ", name AS " Item Name"  
FROM items  
WHERE name LIKE '%o%';
```



Item ID	Item Name
im01101044	gloves
im01101046	socks
im01101047	game top

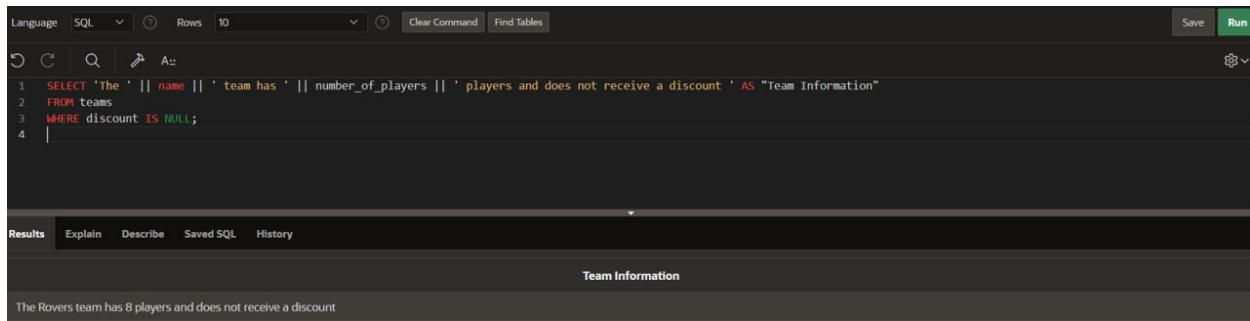
SQL - PART 4

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.

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



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

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.

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

The screenshot shows a SQL editor interface with the following details:

- Language:** SQL
- Rows:** 10
- Clear Command** and **Find Tables** buttons
- Results** tab selected
- Query:**

```
1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and receives a discount of ' || discount || ' percent.' AS "Team Information"
2 FROM teams
3 WHERE discount IS NOT NULL;
4
5
```
- Output:**

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.

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 starford area of Liverpool. Use Customer Number, Street Address and Postal Code as the column aliases.

`SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" FROM customers_addresses WHERE city = 'Liverpool' AND address_line_2 = 'Starford';`

The screenshot shows a SQL editor interface with the following details:

- Language:** SQL
- Rows:** 10
- Clear Command** and **Find Tables** buttons
- Results** tab selected
- 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 city = 'Liverpool' AND address_line_2 = 'Starford';
4
5
```
- Output:**

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK

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.

```
SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" FROM customers_addresses WHERE city = 'Liverpool' OR address_line_2 = 'Starford';
```

The screenshot shows a SQL editor interface with the following details:

- Toolbar:** Language (SQL), Rows (10), Clear Command, Find Tables, Save.
- Query Editor:** Contains the following SQL code:

```
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';
4
```
- Results Tab:** Selected. Shows the output of the query in a table format:

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK
c00001	65 Acacia Drive	LP83JHR

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.

```
SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS "Postal Code" FROM customers_addresses WHERE city NOT IN ('Liverpool');
```

The screenshot shows a SQL editor interface with the following details:

- Toolbar:** Language (SQL), Rows (10), Clear Command, Find Tables, Save.
- Query Editor:** Contains the following SQL code:

```
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');
4
5
```
- Results Tab:** Selected. Shows the output of the query in a table format:

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

SQL 3 - PART 5

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.

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

The screenshot shows a SQL editor interface. At the top, there are buttons for Language (SQL), Rows (set to 10), Clear Command, and Find Tables. Below the editor area, the query is displayed:

```
1 SELECT name AS "Team Name", number_of_players AS "Number of Players"  
2 FROM teams  
3 ORDER BY name  
4  
5
```

Below the query, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing the following table:

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

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

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

The screenshot shows a SQL editor interface. At the top, there are buttons for Language (SQL), Rows (set to 10), Clear Command, and Find Tables. Below the editor area, the query is displayed:

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

Below the query, there are tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is selected, showing the following table:

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

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.

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

Language SQL Rows 10 Clear Command Find Tables Save

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

Results Explain Describe Saved SQL History

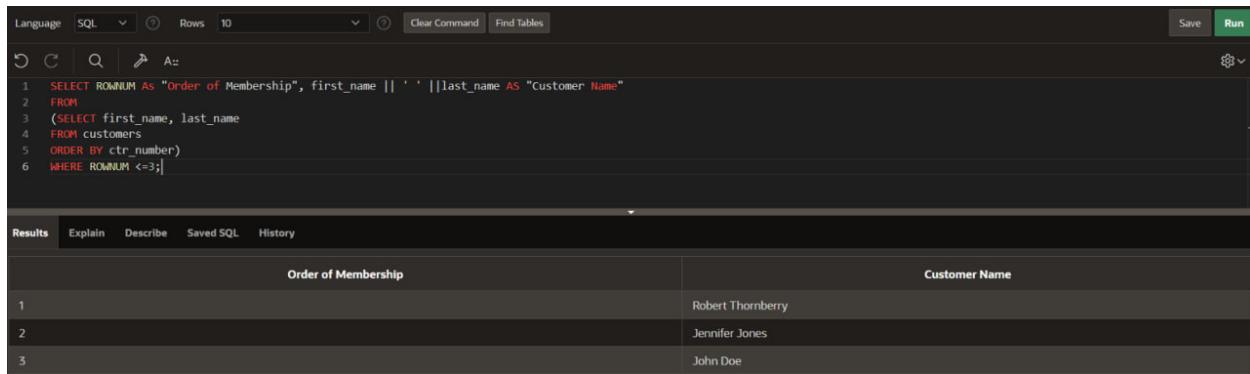
Team Name	Number of Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

SQL 3 - PART 6

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.

```
SELECT ROWNUM As"Order of Membership", first_name || '' ||last_name AS
"Customer Name"
FROM
(SELECT first_name, last_name
FROM customers
ORDER BY ctr_number)
WHERE ROWNUM<=3;
```



	Order of Membership	Customer Name
1		Robert Thornberry
2		Jennifer Jones
3		John Doe

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.

```
SELECT first_name || '' ||last_name AS "Sales Representative Details" FROM
salesRepresentatives WHERE COMMISSION_RATE=:COMMISSION_RATE ORDER BY
last_name;
```

<input type="button" value="Submit"/>	
Bind Variable	Value
:COMMISSION_RATE	10

Commission rate is entered .

```
SELECT first_name || ' ' || last_name AS "Sales Representative Details"
FROM sales_representatives
WHERE COMMISSION_RATE = :COMMISSION_RATE
ORDER BY last_name;
```

Results Explain Describe Saved SQL History

Sales Representative Details
Charles Raymond