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UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

Lab 3: DML 2

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Course Code	SECD2523
Section	08

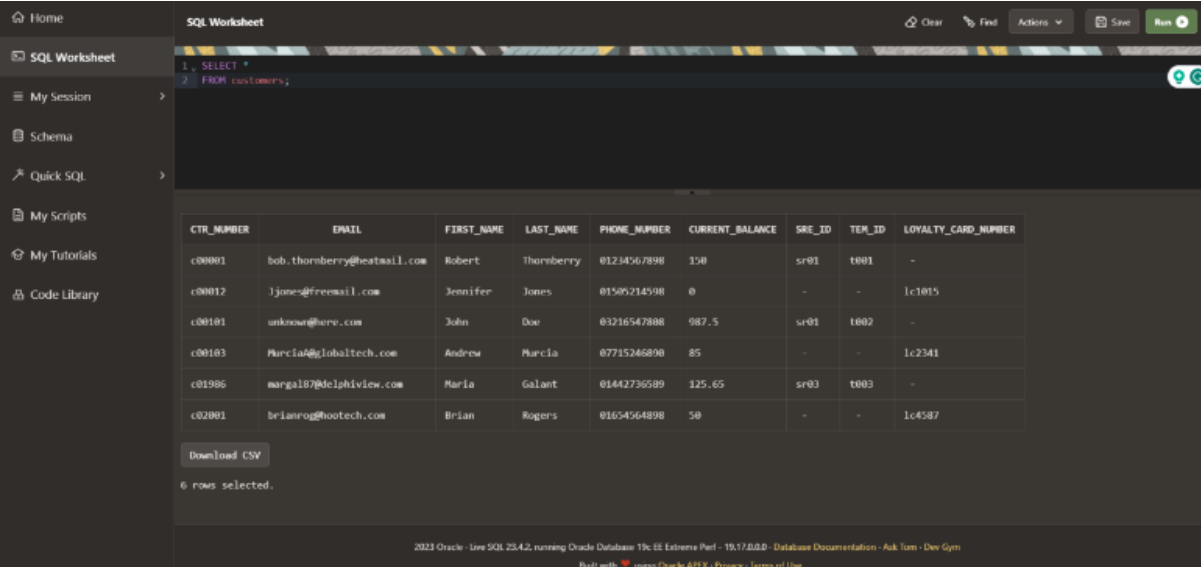
Section 6 Lesson 6 Exercise 1: Retrieving Data Using SELECT

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.

1. Customers.



The screenshot shows the SQL Worksheet interface with the following SQL query:

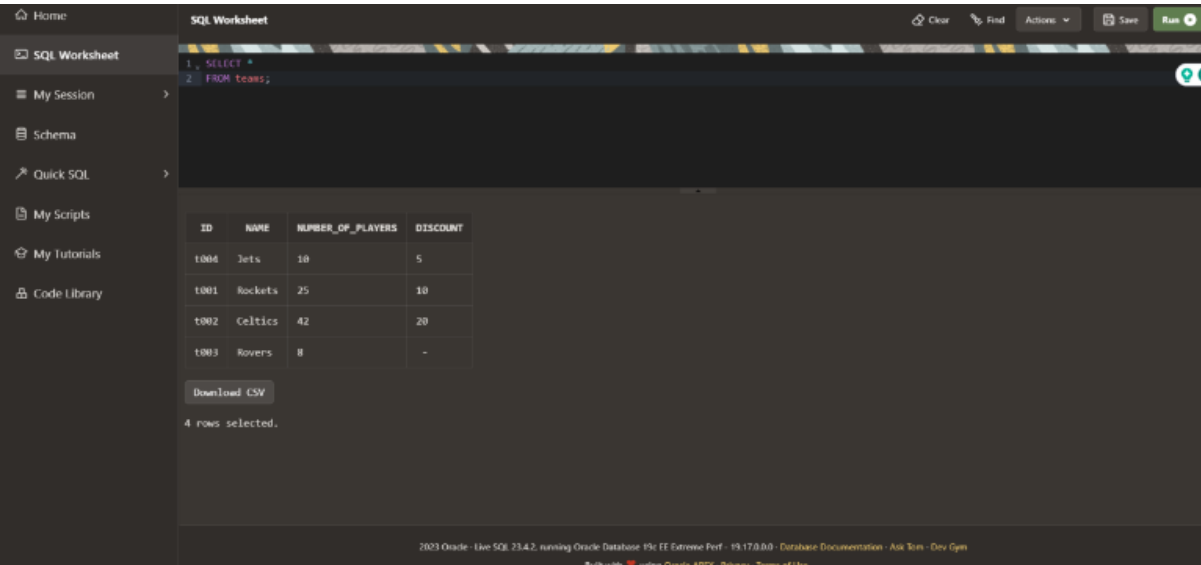
```
1. SELECT *  
2. FROM customers;
```

The results table displays the following data:

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
c00001	bob.thornberry@heatsail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
c00012	jones@freemail.com	Jennifer	Jones	01505214598	0	-	-	1c1015
c00101	unknown@nrc.com	John	Doe	03216547808	987.5	sr01	t002	-
c00103	Murcia@globaltech.com	Andrew	Murcia	07715246890	85	-	-	1c2341
c01986	margal07@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-
c02001	brianrog@hotech.com	Brian	Rogers	01654564898	50	-	-	1c4587

6 rows selected.

2. Teams



The screenshot shows the SQL Worksheet interface with the following SQL query:

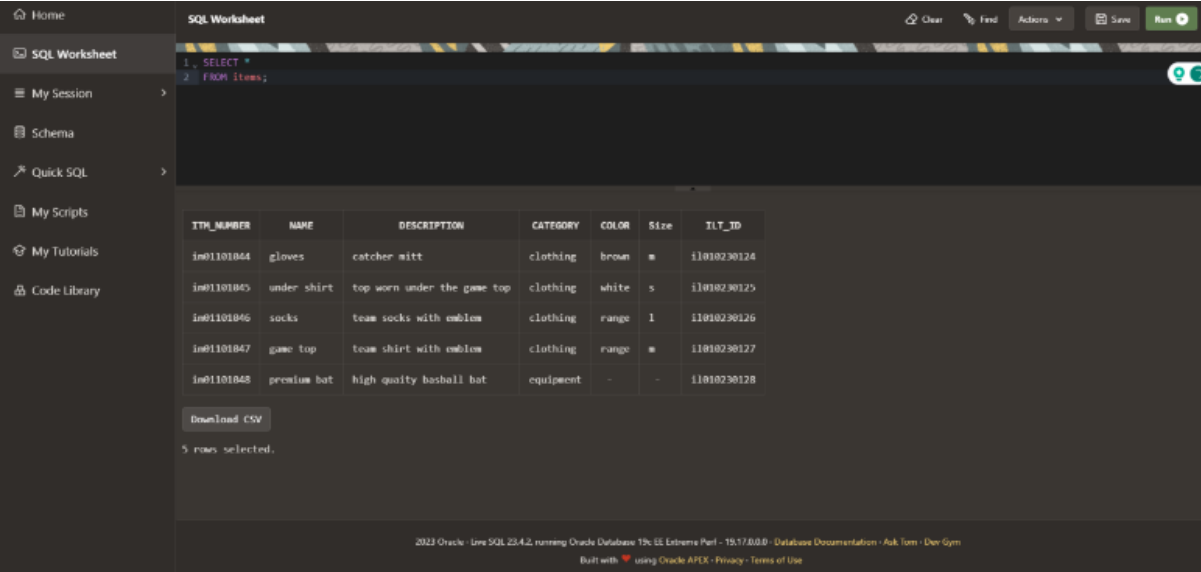
```
1. SELECT *  
2. FROM teams;
```

The results table displays the following data:

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

4 rows selected.

3. Items



The screenshot shows the SQL Worksheet interface with the following SQL query:

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

The result is a table with 5 rows and 7 columns:

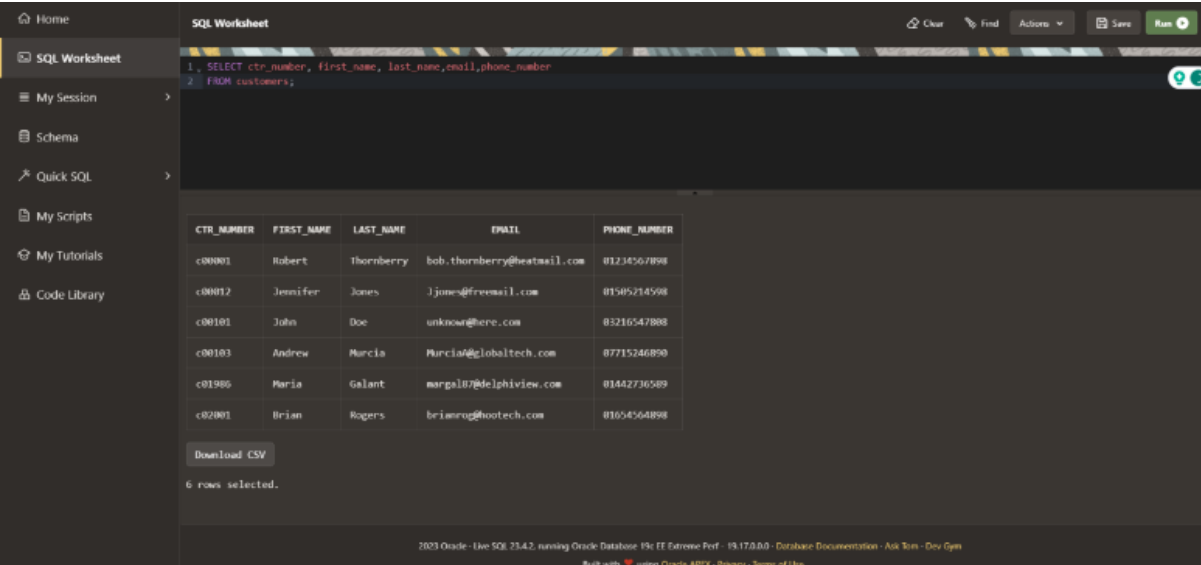
ITH_NUMBER	NAME	DESCRIPTION	CATEGORY	COLOR	Size	ITL_ID
in01101044	gloves	catcher mitt	clothing	brown	M	il010230124
in01101045	under shirt	top worn under the game top	clothing	white	S	il010230125
in01101046	socks	team socks with emblem	clothing	orange	L	il010230126
in01101047	game top	team shirt with emblem	clothing	orange	M	il010230127
in01101048	premium bat	high quality baseball bat	equipment	-	-	il010230128

Download CSV
5 rows selected.

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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 SQL Worksheet interface with the following SQL query:

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

The result is a table with 6 rows and 5 columns:

CTR_NUMBER	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER
CON001	Robert	Thornberry	bob.thornberry@heatmail.com	01234567898
CON012	Jennifer	Jones	j.jones@freemail.com	01505214508
CON001	John	Doe	unknown@here.com	03216547888
CON003	Andrew	Murcia	Murcia@globaltech.com	07715246890
CON006	Maria	Galant	margal07@delphiview.com	01442736589
CON001	Brian	Rogers	brianrog@hooitech.com	01654564898

Download CSV
6 rows selected.

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

The screenshot shows the SQL Worksheet interface. The left sidebar contains navigation links: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area displays a SQL query in a dark-themed editor:

```
1. SELECT name, number_of_players
2. FROM team;
```

Below the editor, the results are displayed in a table:

NAME	NUMBER_OF_PLAYERS
Jets	10
Rockets	25
Celtics	42
Rovers	8

Below the table, there is a "Download CSV" button and the text "4 rows selected." At the bottom of the interface, a status bar 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".

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

The screenshot shows the SQL Worksheet interface. The left sidebar contains navigation links: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area displays a SQL query in a dark-themed editor:

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

Below the editor, the results are displayed in a table:

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

Below the table, there is a "Download CSV" button and the text "5 rows selected." At the bottom of the interface, a status bar 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".

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

[illegible]

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.

Home

SQL Worksheet

My Session

Schema

Quick SQL

My Scripts

My Tutorials

Code Library

Clear

Find

Actions

Save

Run

```

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

```

FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE	CURRENT_BALANCE-5
Robert	Hornberry	c00001	150	145
Jennifer	Jones	c00012	0	-5
John	Doe	c00101	987.5	982.5
Andrew	Murcia	c00103	85	80
Maria	Galant	c01906	125.65	120.65
Brian	Rogers	c02001	50	45

Download CSV

6 rows selected.

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

The Current Balance can't have the value of Zero

Part 2 : Using Column Aliases

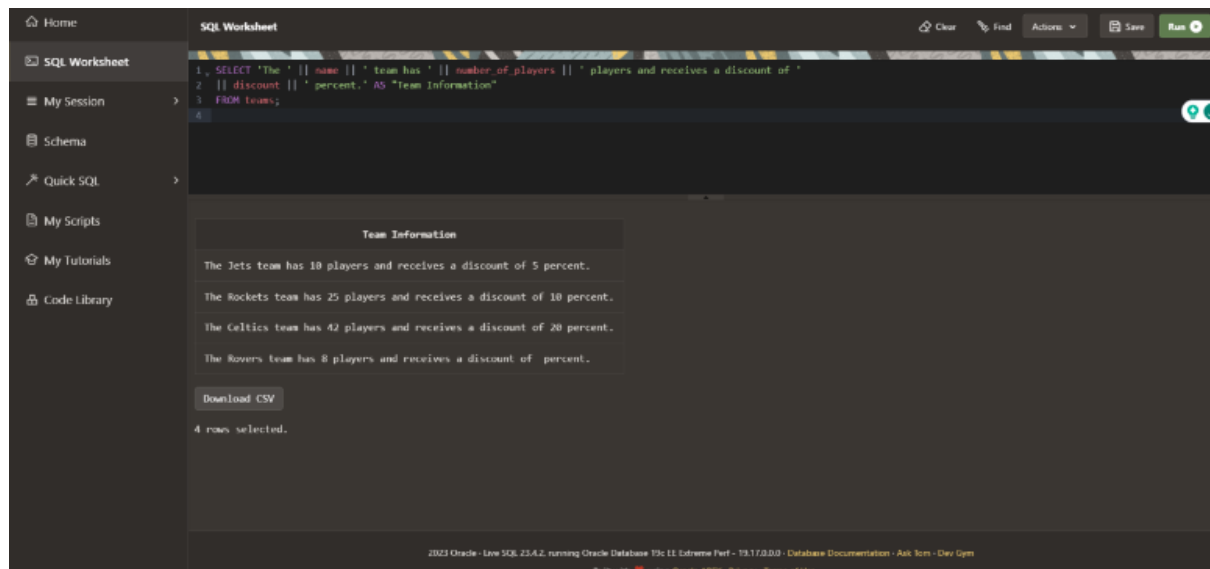
1. You previously wrote a query that display the customer's first name, last name, current balance and monthly payment. Rewrite the query to use First Name, Last Name, Balance and Monthly Repayments as the column aliases. The aliases are to be shown exactly as described (case sensitive).

[illegible]

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.



2. Why does the last team not show a discount
Doesn't get any discounts because It has the value of Zero.

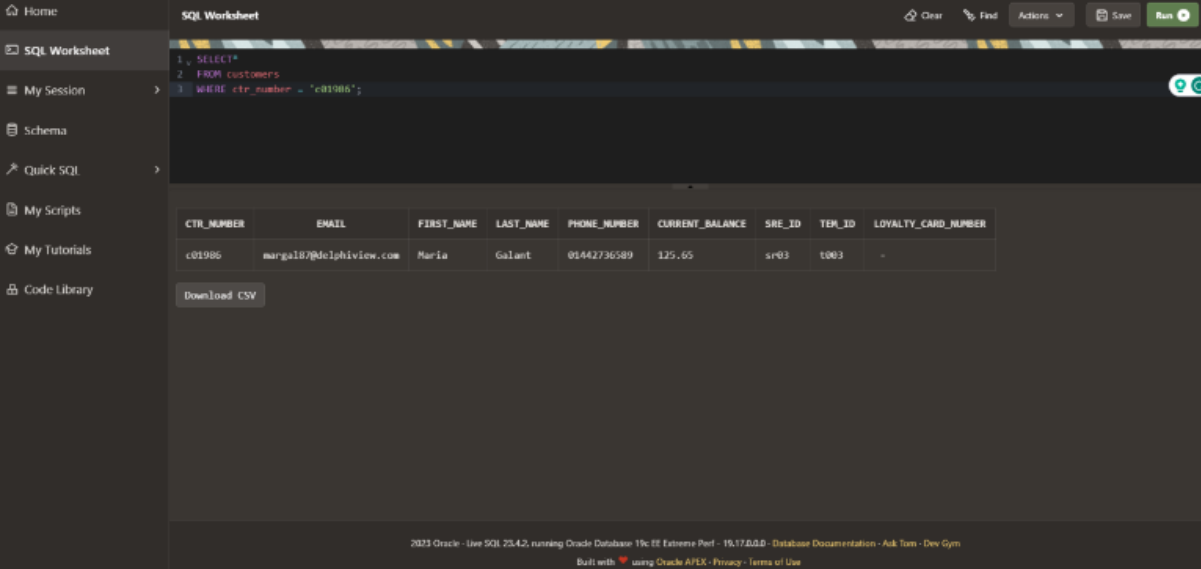
Section 6 Lesson 7 Exercise 1: Restricting Data Using WHERE

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.



The screenshot shows the SQL Worksheet interface. The SQL query entered is:

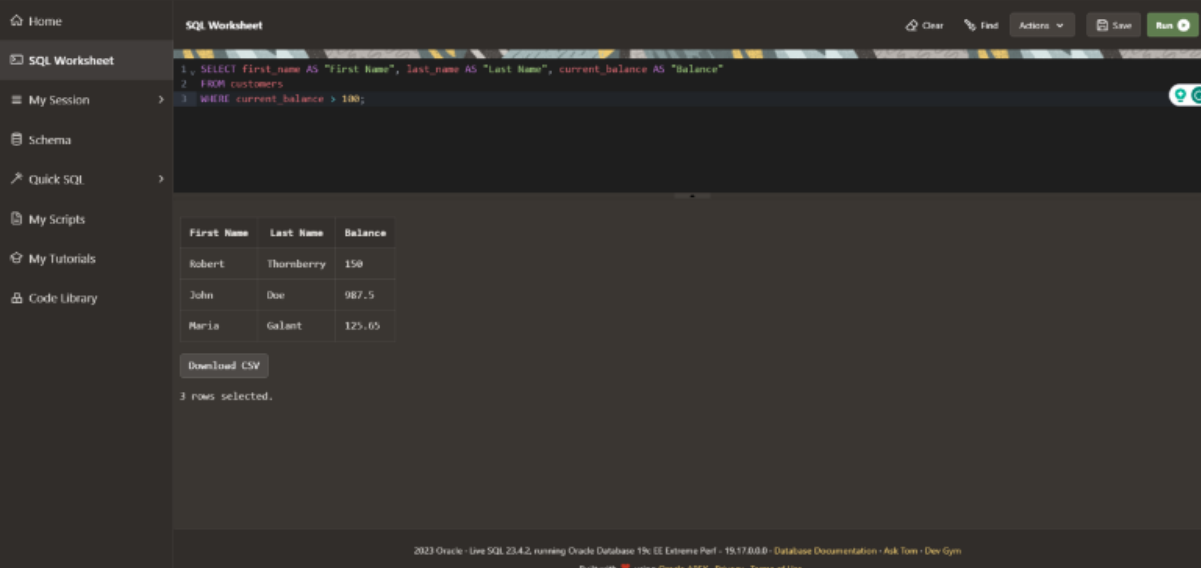
```
1. SELECT*  
2. FROM customers  
3. WHERE ctr_number = 'c01986';
```

The results table displays the following data:

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEP_ID	LOYALTY_CARD_NUMBER
c01986	marga187@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-

A "Download CSV" button is visible below the table.

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 SQL Worksheet interface. The SQL query entered is:

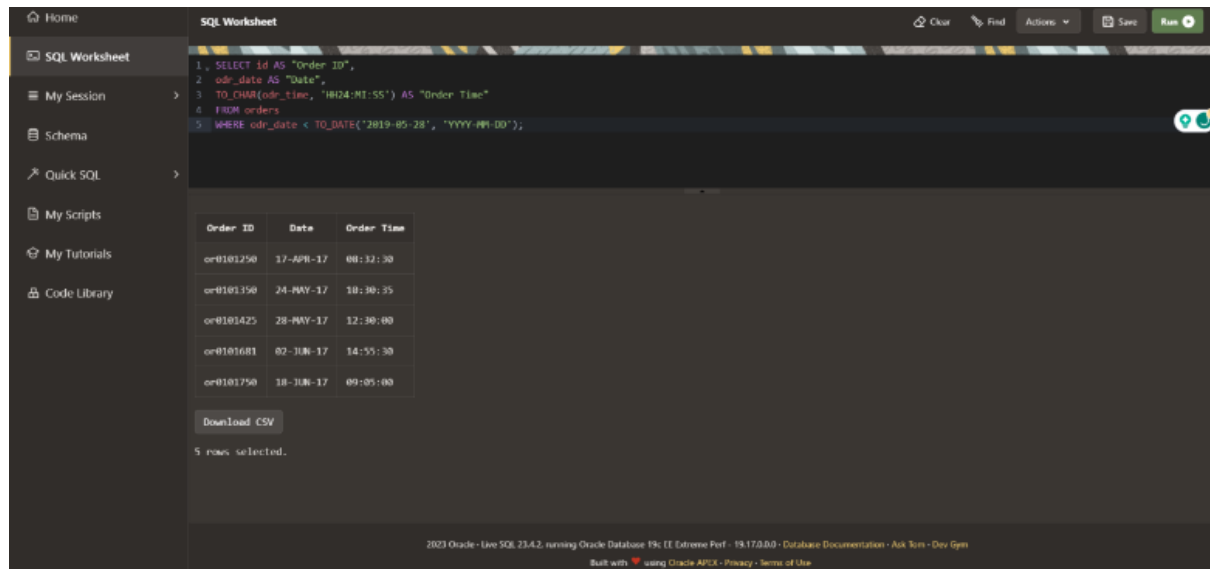
```
1. SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance"  
2. FROM customers  
3. WHERE current_balance > 100;
```

The results table displays the following data:

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

A "Download CSV" button is visible below the table. Below the table, it says "3 rows selected."

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 a web-based SQL editor interface. The left sidebar contains navigation links: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area displays a SQL query in a dark-themed editor:

```
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');
```

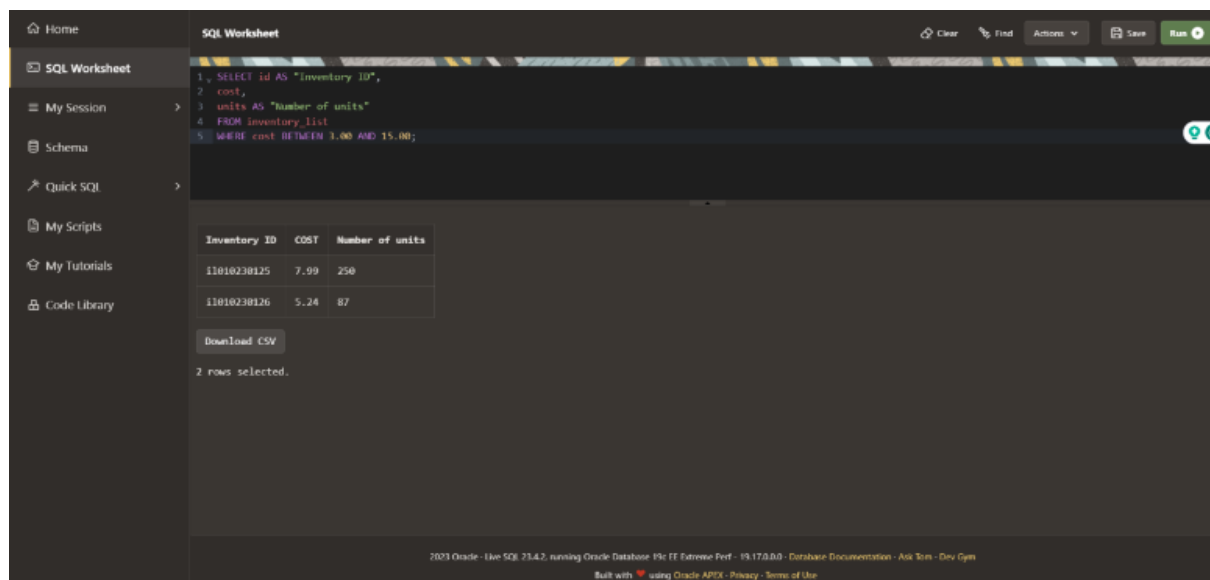
Below the editor, the results are displayed in a table with the following data:

Order ID	Date	Order Time
or0101250	17-APR-17	00:12:30
or0101350	24-MAY-17	10:30:35
or0101425	28-MAY-17	12:30:00
or0101681	02-JUN-17	14:55:30
or0101750	18-JUN-17	09:05:00

Below the table, there is a "Download CSV" button and the text "5 rows selected." At the bottom of the interface, a footer line reads: "2023 Oracle - Use SQL 23.4.2, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gyn. Built with using Oracle APEX - Privacy - Terms of Use."

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 same SQL editor interface. The query in the editor is:

```
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 table shows the following data:

Inventory ID	COST	Number of units
11010230125	7.99	250
11010230126	5.24	87

Below the table, there is a "Download CSV" button and the text "2 rows selected." The footer at the bottom of the interface reads: "2023 Oracle - Use SQL 23.4.2, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gyn. Built with using Oracle APEX - Privacy - Terms of Use."

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 a web-based SQL Worksheet interface. On the left is a sidebar with navigation links: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area displays a SQL query:

```
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)
```

Below the query, the results are shown in a table:

Inventory ID	COST	Number of units
i1010230124	2.5	100

A "Download CSV" button is located below the table. At the bottom of the interface, a footer line reads: "2023 Oracle - Use SQL 23.4.2, running Oracle Database 19c EE Extreme Pack - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym".

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 same SQL Worksheet interface. The SQL query is now:

```
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)
```

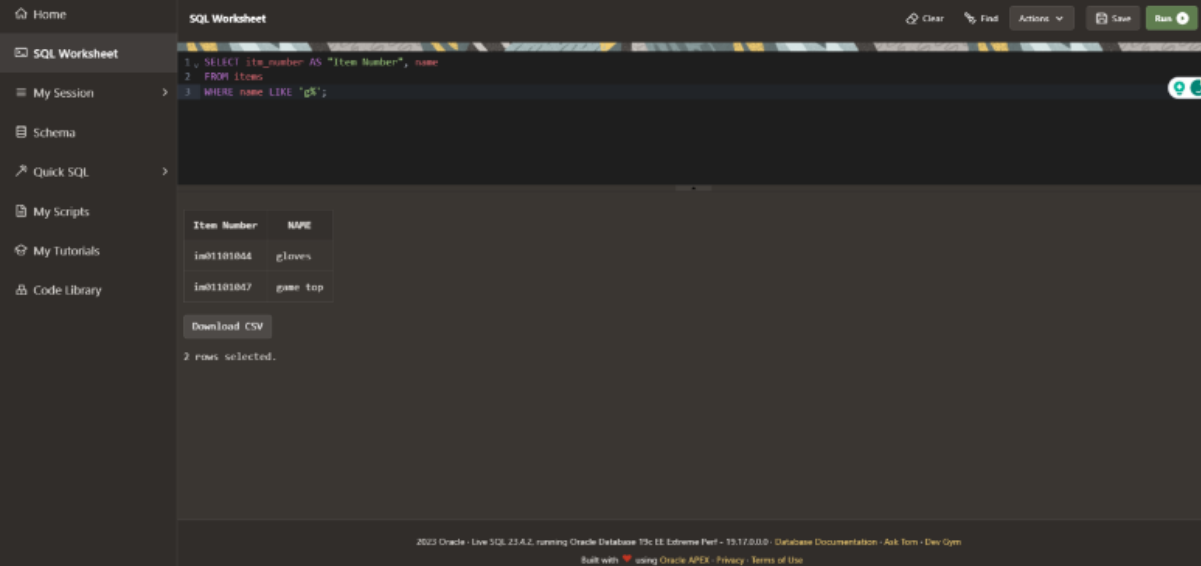
The results table shows four rows:

Inventory ID	COST	Number of units
i1010230125	7.99	250
i1010230126	5.24	87
i1010230127	18.95	65
i1010230128	97.46	8

A "Download CSV" button is present. Below the table, it says "4 rows selected." The footer at the bottom reads: "2024 Oracle - Use SQL 23.4.2, running Oracle Database 19c EE Extreme Pack - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gym".

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 SQL Worksheet interface. The SQL query is as follows:

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

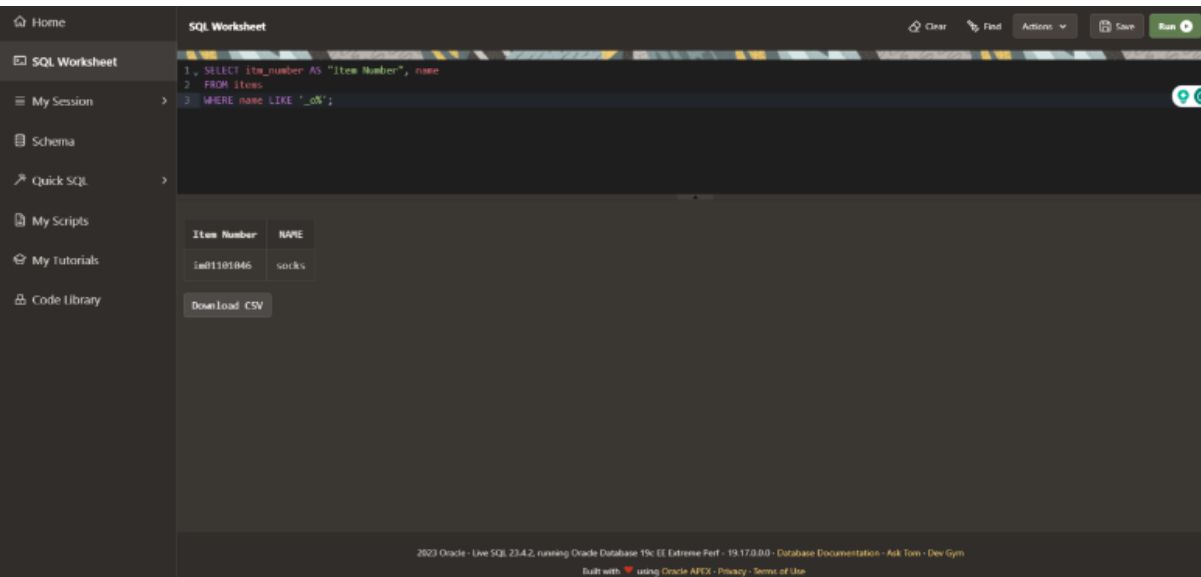
The results table displays the following data:

Item Number	NAME
im01101044	gloves
im01101047	game top

Below the table, it indicates "2 rows selected." and provides a "Download CSV" button. The footer of the interface states: "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."

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 SQL Worksheet interface. The SQL query is as follows:

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

The results table displays the following data:

Item Number	NAME
im01101046	socks

Below the table, it indicates "1 row selected." and provides a "Download CSV" button. The footer of the interface states: "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."

Section 6 Lesson 7 Exercise 2: Restricting Data Using WHERE

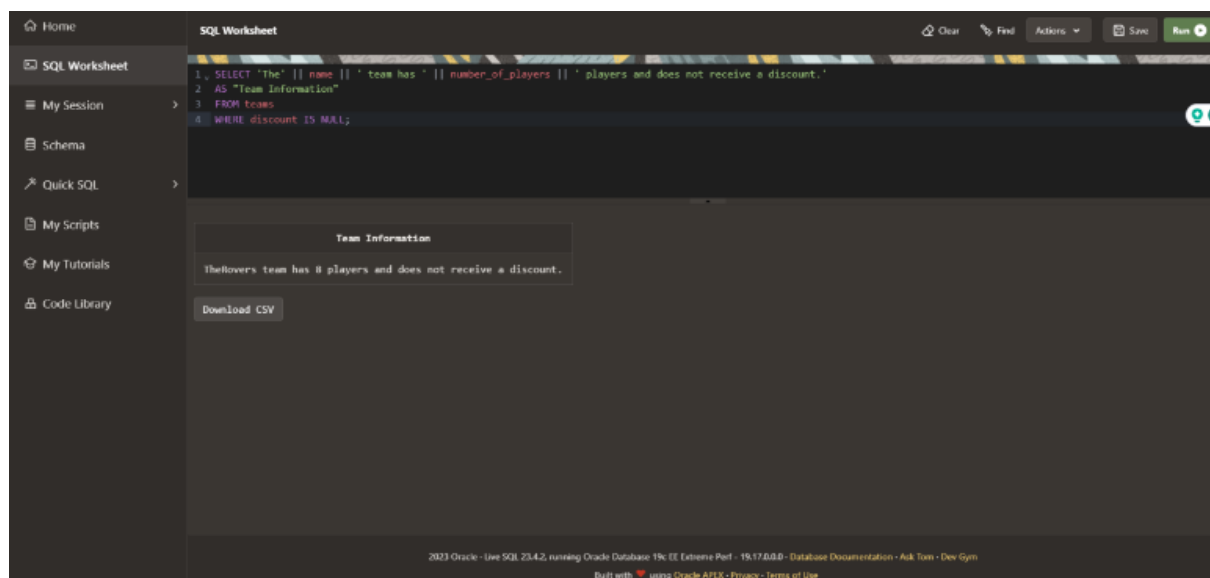
limit rows using WHERE (S6L7 Objective 1)

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



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 SQL Worksheet interface with a query that filters teams based on a discount. The query is as follows:

```

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;

```

The results are displayed in a table titled "Team Information":

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.

Below the table, there is a "Download CSV" button and a message stating "3 rows selected." The footer indicates the environment is Oracle SQL 23.4.2 running on Oracle Database 19c EE Extreme Perf.

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 SQL Worksheet interface with a query that filters customers by city and address. The query is as follows:

```

1. SELECT ctn.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';

```

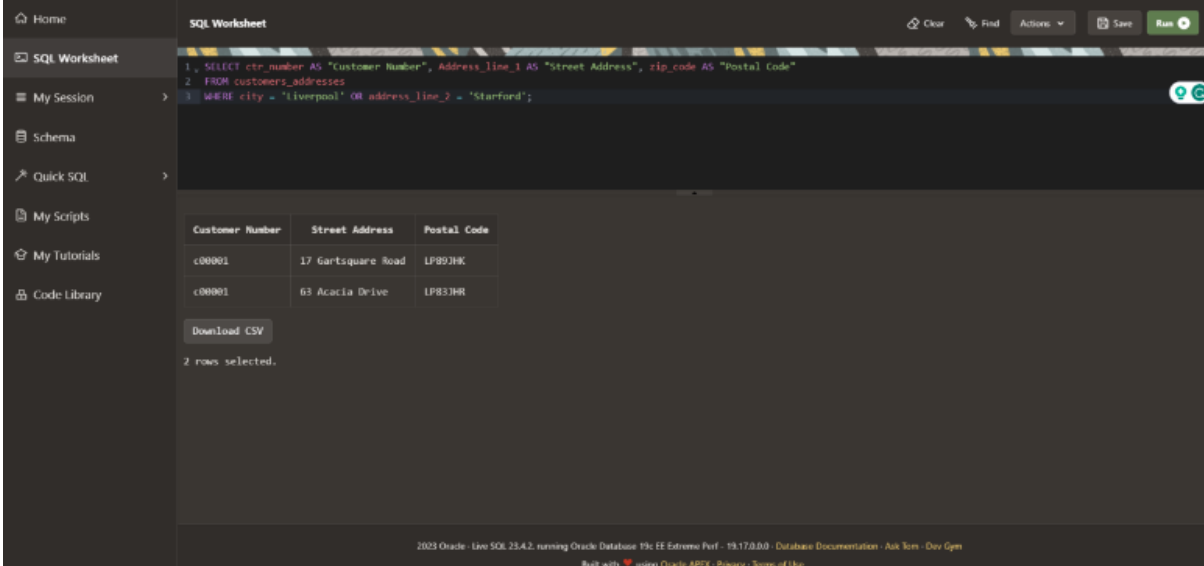
The results are displayed in a table:

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	L90 3HK

Below the table, there is a "Download CSV" button. The footer indicates the environment is Oracle SQL 23.4.2 running on Oracle Database 19c EE Extreme Perf.

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 SQL Worksheet interface. The SQL query is as follows:

```
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';
```

The results are displayed in a table with 3 columns: Customer Number, Street Address, and Postal Code. There are 2 rows selected.

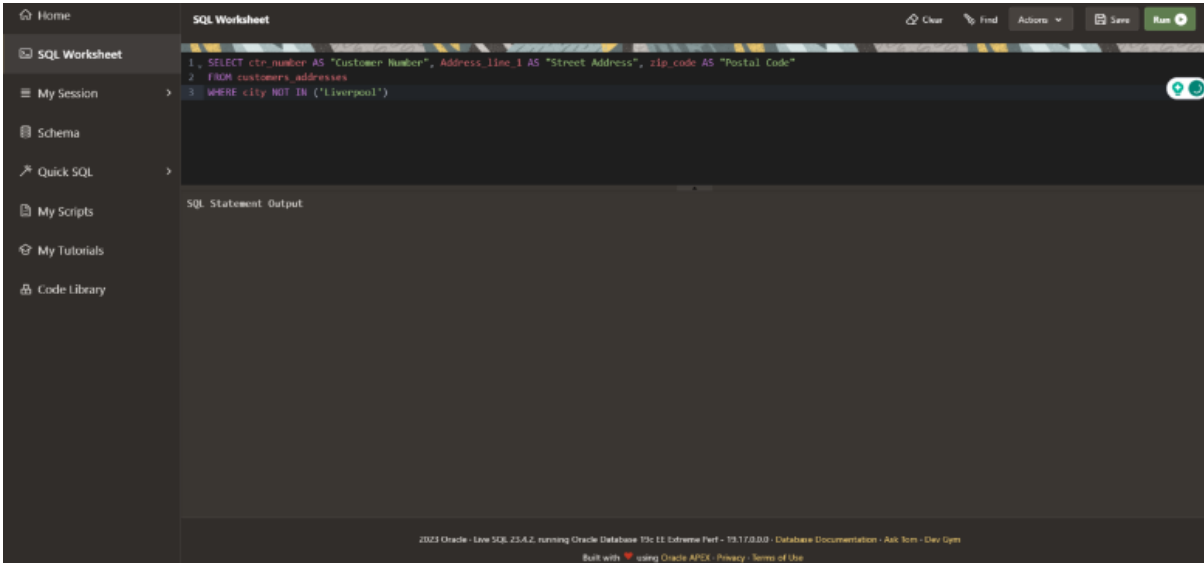
Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK
c00001	63 Acacia Drive	LP83JHR

Download CSV
2 rows selected.

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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 SQL Worksheet interface. The SQL query is as follows:

```
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');
```

The results section is currently empty, showing "SQL Statement Output".

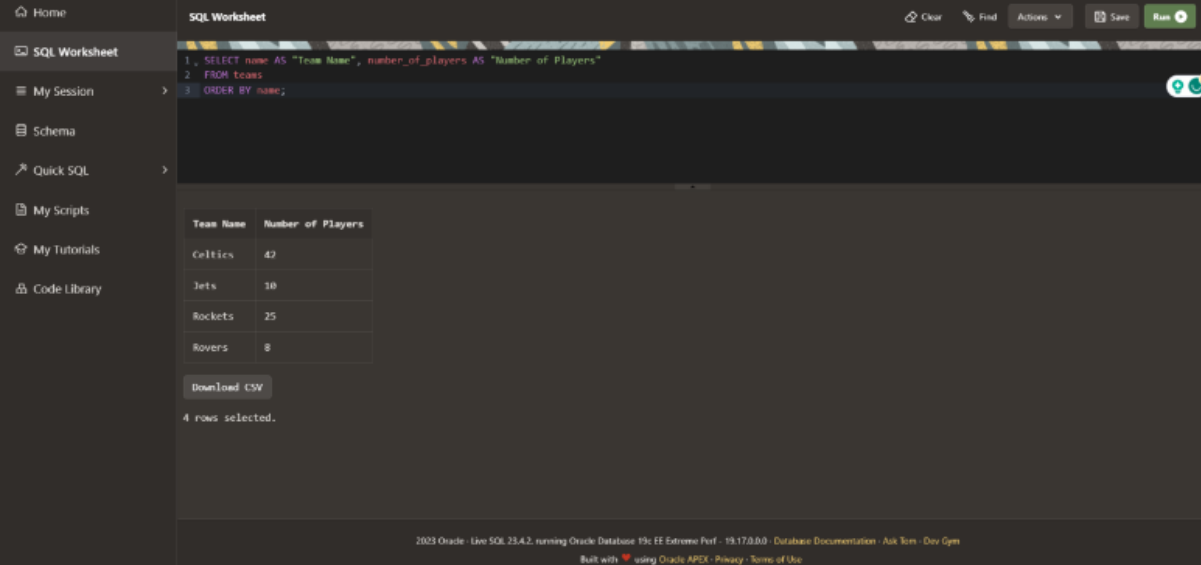
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Section 6 Lesson 8 Exercise 1: Sorting Data Using ORDER BY

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 SQL Worksheet interface. The SQL editor contains the following query:

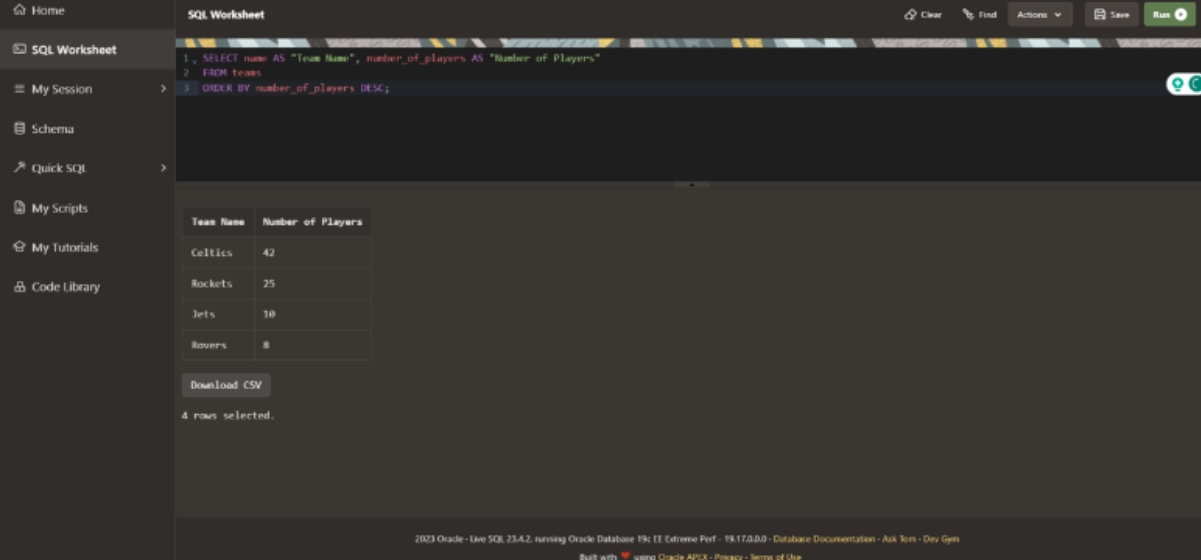
```
1. SELECT name AS "Team Name", number_of_players AS "Number of Players"
2. FROM teams
3. ORDER BY name;
```

The results are displayed in a table below the editor:

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

Below the table, it says "4 rows selected." and there is a "Download CSV" button. The footer of the interface indicates: "2023 Oracle - Live SQL 23.4.2, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gyn. Built with using Oracle APEX - Privacy - Terms of Use."

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 SQL Worksheet interface. The SQL editor contains the following query:

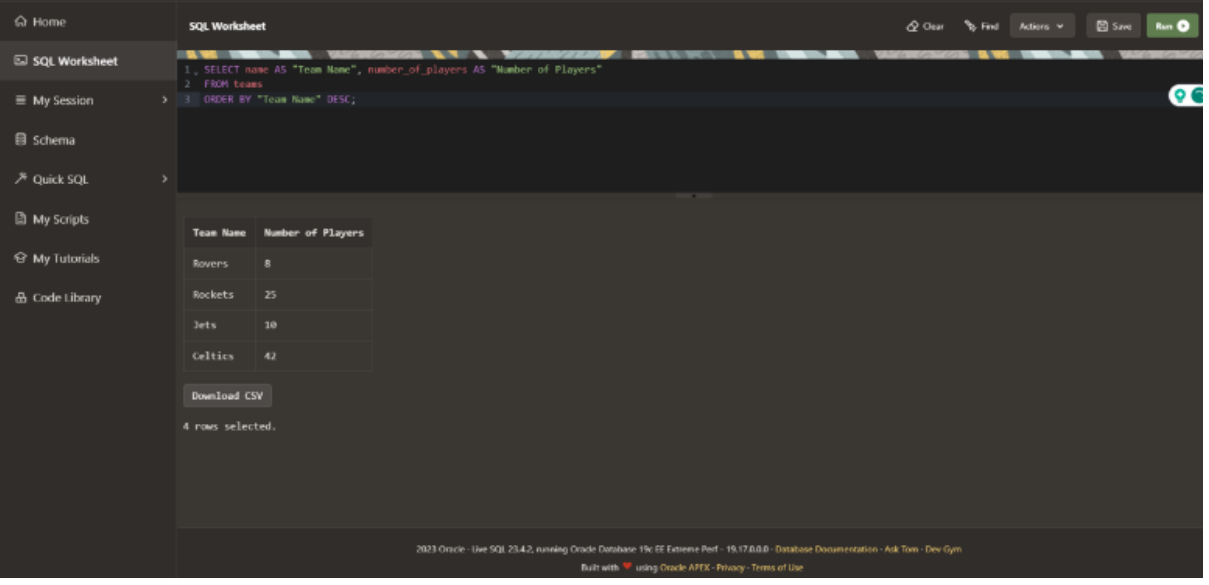
```
1. SELECT name AS "Team Name", number_of_players AS "Number of Players"
2. FROM teams
3. ORDER BY number_of_players DESC;
```

The results are displayed in a table below the editor:

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

Below the table, it says "4 rows selected." and there is a "Download CSV" button. The footer of the interface indicates: "2023 Oracle - Live SQL 23.4.2, running Oracle Database 19c EE Extreme Perf - 19.17.0.0.0 - Database Documentation - Ask Tom - Dev Gyn. Built with using Oracle APEX - Privacy - Terms of Use."

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 an SQL Worksheet interface. On the left is a sidebar with navigation links: Home, SQL Worksheet, My Session, Schema, Quick SQL, My Scripts, My Tutorials, and Code Library. The main area is titled 'SQL Worksheet' and contains a SQL query editor with the following code:

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

Below the editor, the results are displayed in a table:

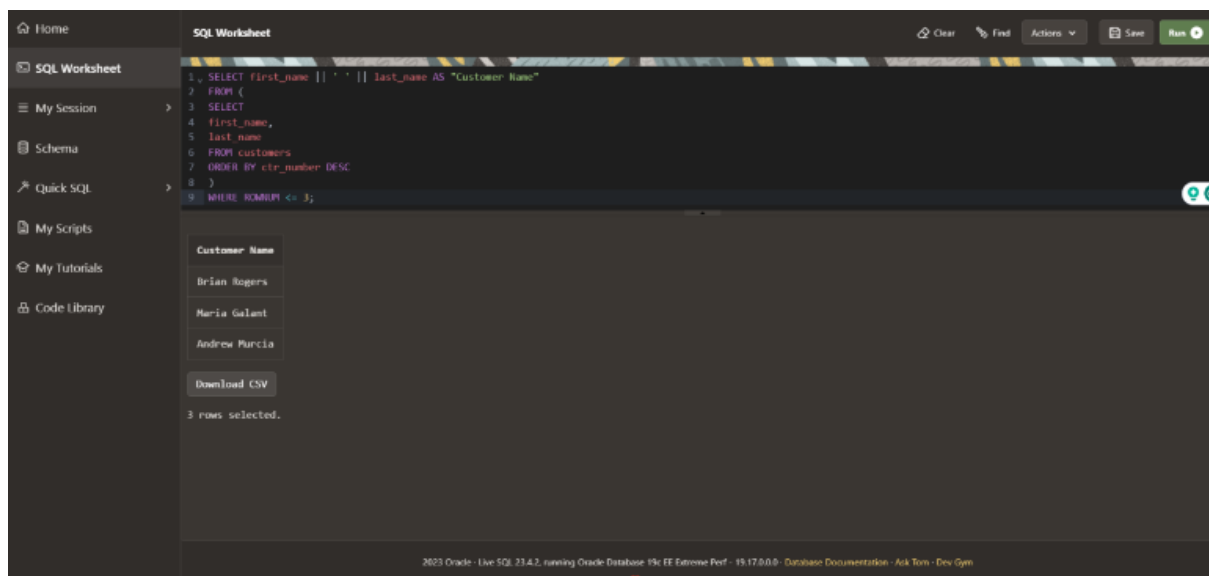
Team Name	Number of Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

Below the table, there is a 'Download CSV' button and the text '4 rows selected.' At the bottom of the interface, there is a footer with the following text: '2023 Oracle - Use 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.'

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

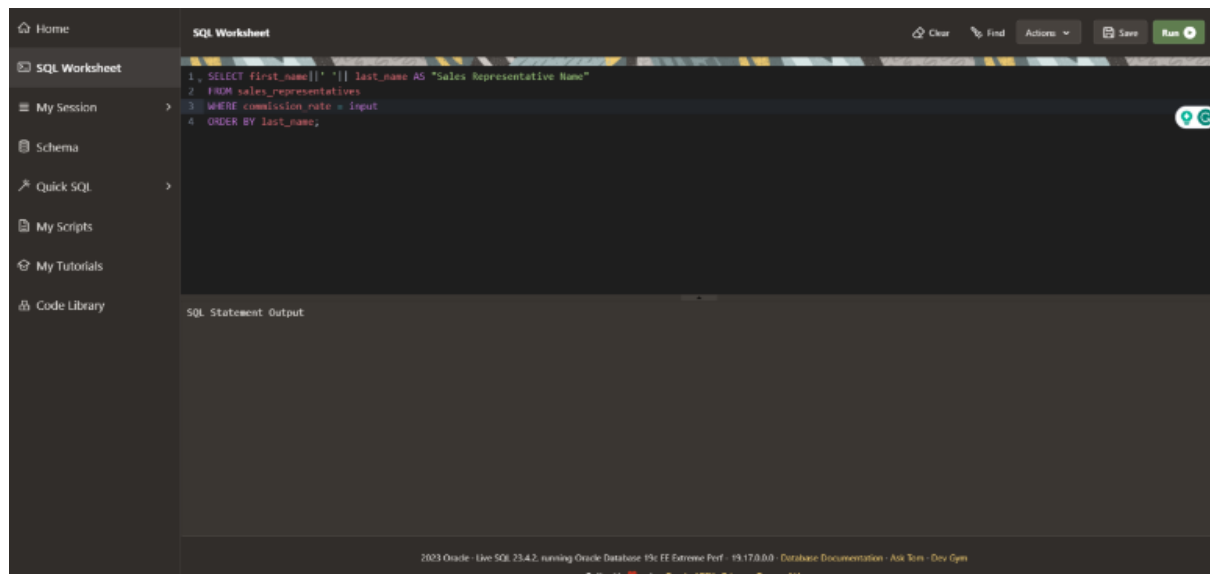
Part 1 : TOP-N-ANALYSIS (S6L8 Objective 3)

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.



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.



Assuming Input is 5: it should be {first_name, last_name, commission_rate}

R1 = {'Barry', 'Speed', 5}

R2 = {'Victoria', 'Wright', 5}