

## Database Design Project

### Oracle Baseball League Store Database

#### Project Scenario:

You are a small consulting company specializing in database development. You have just been awarded the contract to develop a data model for a database application system for a small retail store called Oracle Baseball League (OBL).

The Oracle Baseball League store serves the entire surrounding community selling baseball kit. The OBL has two types of customer, there are individuals who purchase items like balls, cleats, gloves, shirts, screen printed t-shirts, and shorts. Additionally customers can represent a team when they purchase uniforms and equipment on behalf of the team.

Teams and individual customers are free to purchase any item from the inventory list, but teams get a discount on the list price depending on the number of players. When a customer places an order we record the order items for that order in our database.

OBL has a team of three sales representatives that officially only call on teams but have been known to handle individual customer complaints.

## LAB 3: DATA MANIPULATION LANGUAGE DML2 (PART 1 - PART 6)

NAME: ISKANDAR HAKIMI BIN ZULKIPPLI

MATRIC NUMBER: B23CS0040

SECTION: 8

## Section 6 Lesson 6 Exercise 1: Retrieving Data Using SELECT

### Write and Execute SELECT statements (S6L6 Objective 2)

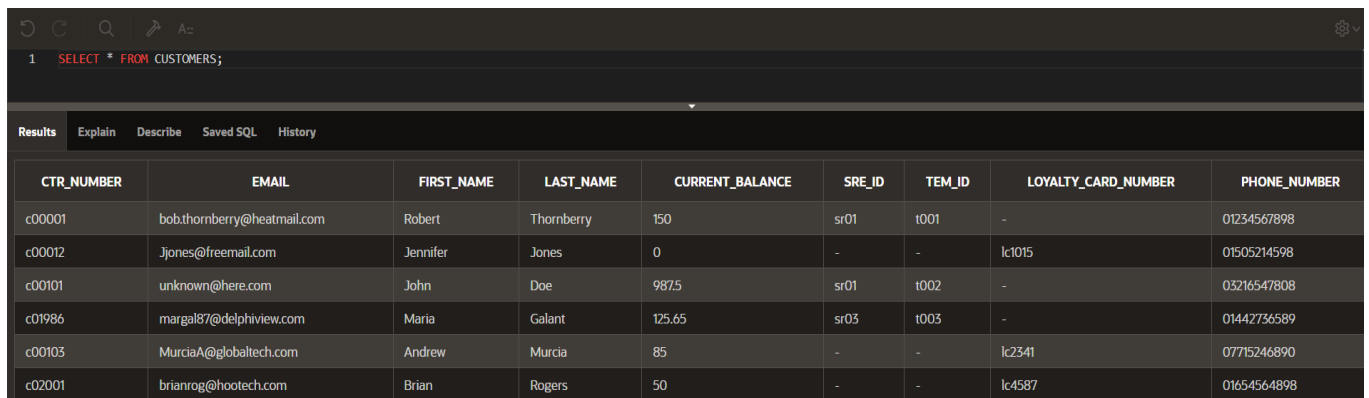
In this exercise you will retrieve data that is stored in the database system by using a SELECT statement.

#### Part 1: Retrieving all columns from a table.

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

1. customers.

Answer:

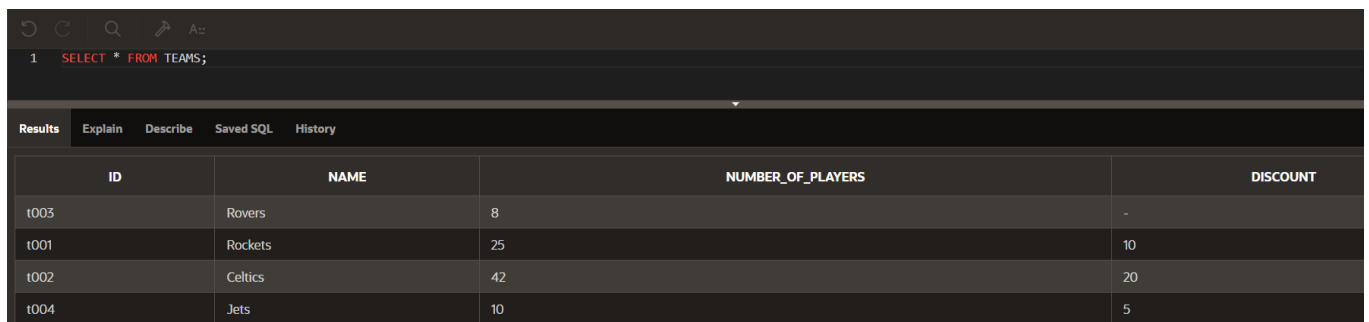


The screenshot shows a database query interface. At the top, there is a toolbar with icons for undo, redo, search, and other functions. Below the toolbar, the SQL statement `1 SELECT * FROM CUSTOMERS;` is entered. The results are displayed in a table with the following columns: CTR\_NUMBER, EMAIL, FIRST\_NAME, LAST\_NAME, CURRENT\_BALANCE, SRE\_ID, TEM\_ID, LOYALTY\_CARD\_NUMBER, and PHONE\_NUMBER. The data rows are as follows:

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

2. teams.

Answer:

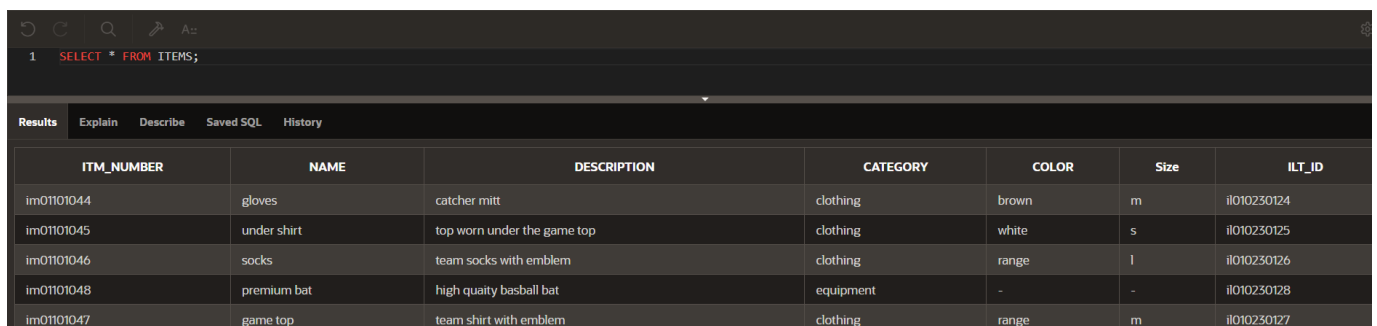


The screenshot shows a database query interface. At the top, there is a toolbar with icons for undo, redo, search, and other functions. Below the toolbar, the SQL statement `1 SELECT * FROM TEAMS;` is entered. The results are displayed in a table with the following columns: ID, NAME, NUMBER\_OF\_PLAYERS, and DISCOUNT. The data rows are as follows:

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

3. items

Answer:



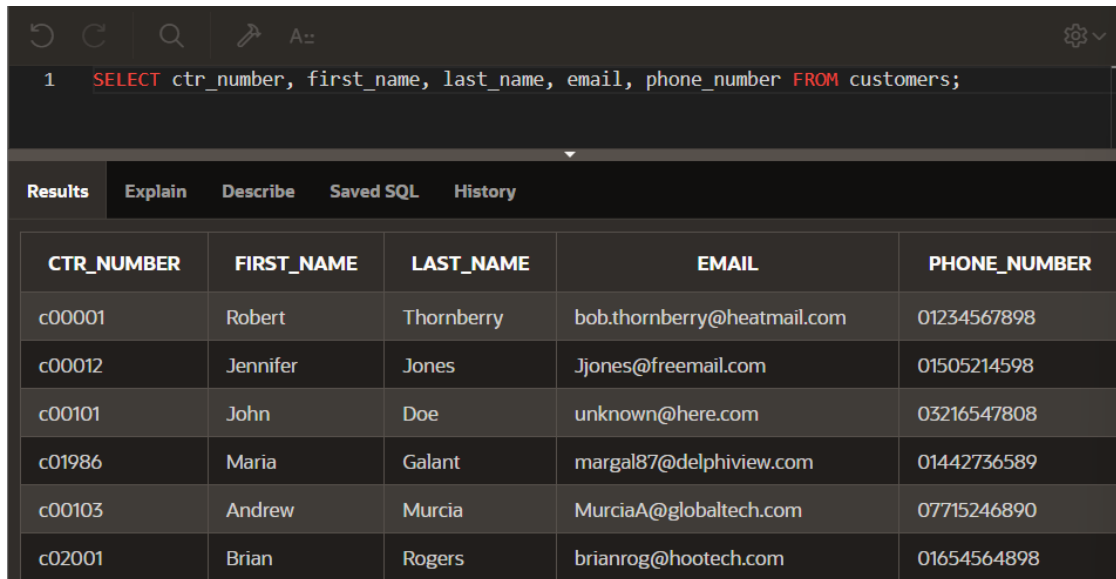
The screenshot shows a database query interface. At the top, there is a toolbar with icons for undo, redo, search, and other functions. Below the toolbar, the SQL statement `1 SELECT * FROM ITEMS;` is entered. The results are displayed in a table with the following columns: ITM\_NUMBER, NAME, DESCRIPTION, CATEGORY, COLOR, Size, and ILT\_ID. The data rows are as follows:

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
im01101048	premium bat	high quaiity basball bat	equipment	-	-	il010230128
im01101047	game top	team shirt with emblem	clothing	range	m	il010230127

## Part 2: Selecting Specific Columns

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

Answer:

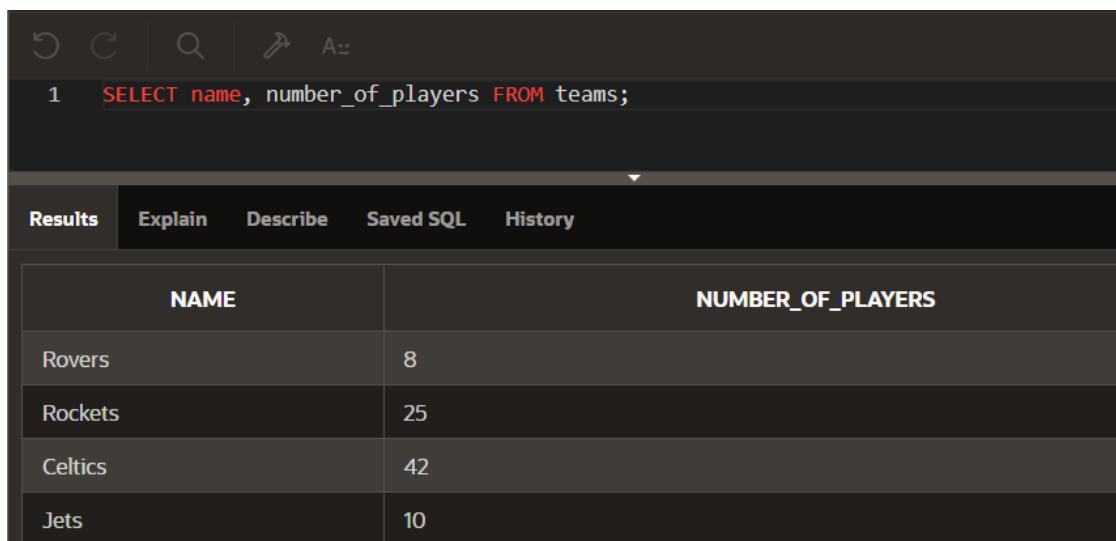


The screenshot shows a SQL query editor with a dark theme. At the top, there are icons for undo, redo, search, and a settings gear. The query text is: `1 SELECT ctr_number, first_name, last_name, email, phone_number FROM customers;`. Below the query, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, displaying a table with 5 columns: CTR\_NUMBER, FIRST\_NAME, LAST\_NAME, EMAIL, and PHONE\_NUMBER. The table contains 7 rows of customer data.

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
c01986	Maria	Galant	margal87@delphiview.com	01442736589
c00103	Andrew	Murcia	MurciaA@globaltech.com	07715246890
c02001	Brian	Rogers	brianrog@hootech.com	01654564898

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

Answer:

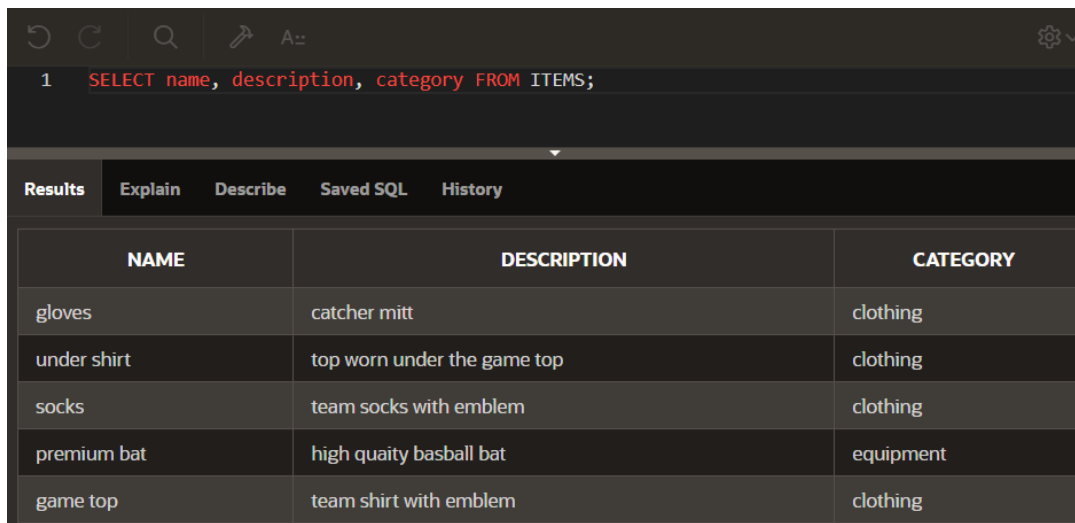


The screenshot shows a SQL query editor with a dark theme. At the top, there are icons for undo, redo, search, and a settings gear. The query text is: `1 SELECT name, number_of_players FROM teams;`. Below the query, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is active, displaying a table with 2 columns: NAME and NUMBER\_OF\_PLAYERS. The table contains 4 rows of team data.

NAME	NUMBER_OF_PLAYERS
Rovers	8
Rockets	25
Celtics	42
Jets	10

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

Answer:



The screenshot shows a SQL query editor interface. At the top, there is a toolbar with icons for undo, redo, search, and a command palette. Below the toolbar, a SQL query is entered: `1 SELECT name, description, category FROM ITEMS;`. Below the query editor, there is a tabbed interface with four tabs: 'Results', 'Explain', 'Describe', and 'History'. The 'Results' tab is selected, displaying a table with three columns: 'NAME', 'DESCRIPTION', and 'CATEGORY'. The table contains five rows of data.

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



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

Answer: The current balance amount allows value to be below 0.

## 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).

Answer:

[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.

Answer:

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

**Results** Explain Describe Saved SQL History

Team Information
The Rovers team has 8 players and receives a discount of 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 Jets team has 10 players and receives a discount of 5 percent.

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

Answer: Because the value of discount for Rover's team is shown to be NULL value.

## Section 6 Lesson 7 Exercise 1: Restricting Data Using WHERE

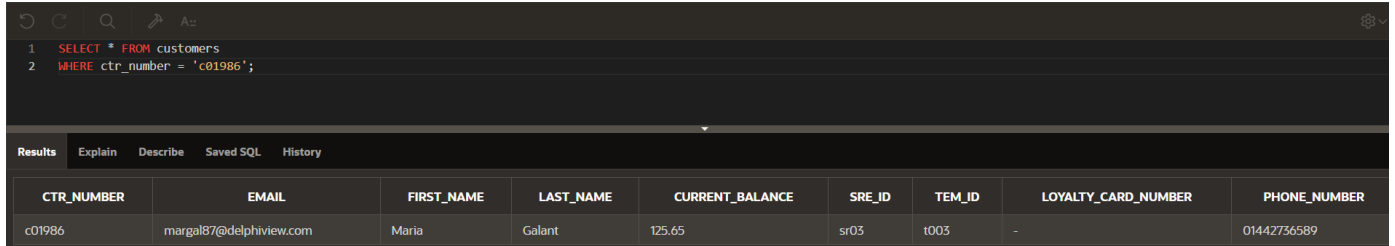
### Limit rows using WHERE (S6L7 Objective 1)

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.

Answer:

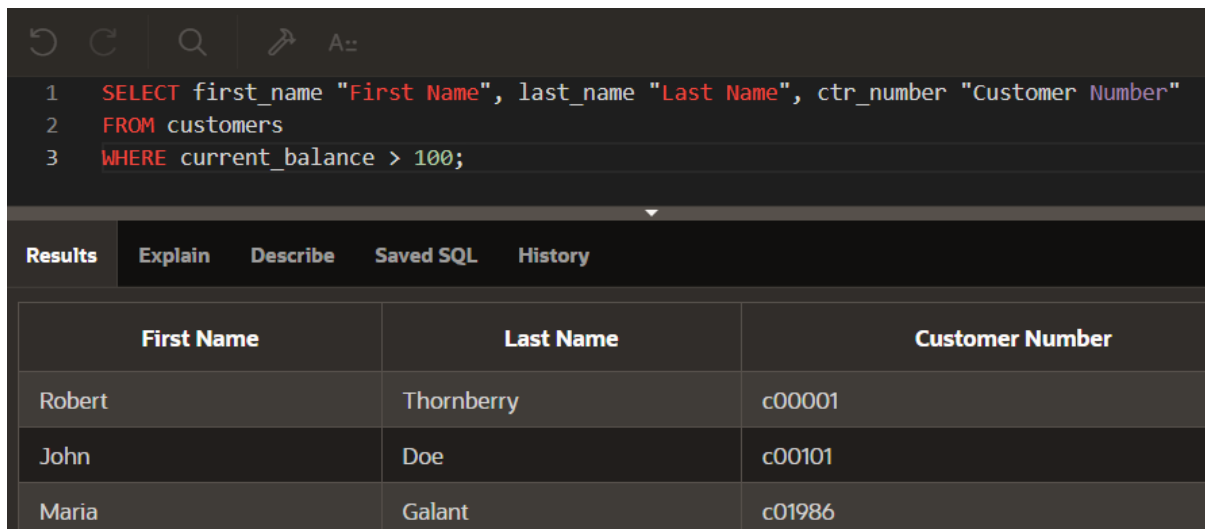


```
1 SELECT * FROM customers
2 WHERE ctr_number = 'c01986';
```

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

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.

Answer:

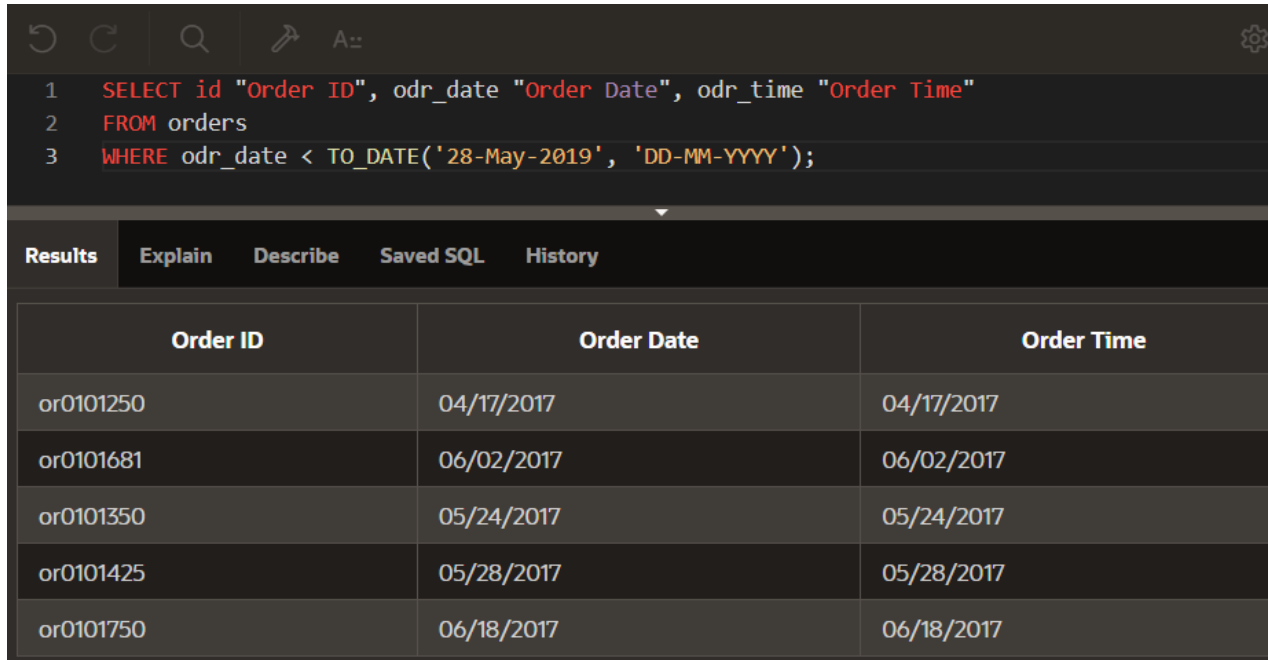


```
1 SELECT first_name "First Name", last_name "Last Name", ctr_number "Customer Number"
2 FROM customers
3 WHERE current_balance > 100;
```

First Name	Last Name	Customer Number
Robert	Thornberry	c00001
John	Doe	c00101
Maria	Galant	c01986

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

Answer:



The screenshot shows a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a command prompt. Below the toolbar, the SQL query is entered in a text area:

```
1 SELECT id "Order ID", odr_date "Order Date", odr_time "Order Time"
2 FROM orders
3 WHERE odr_date < TO_DATE('28-May-2019', 'DD-MM-YYYY');
```

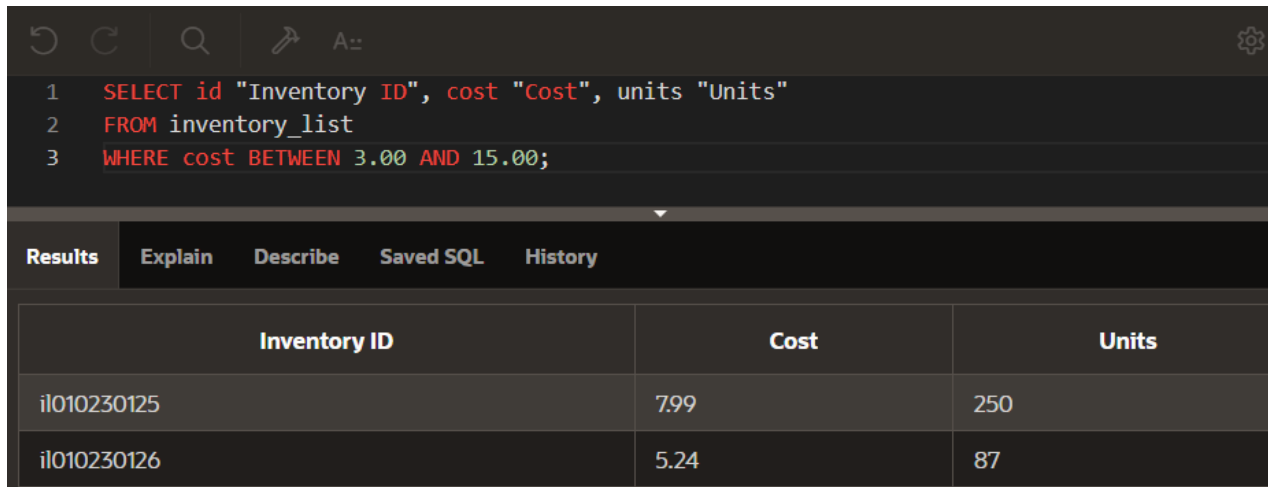
Below the query editor, there is a tabbed interface with 'Results' selected. The results are displayed in a table with three columns: 'Order ID', 'Order Date', and 'Order Time'. The table contains five rows of data.

Order ID	Order Date	Order Time
or0101250	04/17/2017	04/17/2017
or0101681	06/02/2017	06/02/2017
or0101350	05/24/2017	05/24/2017
or0101425	05/28/2017	05/28/2017
or0101750	06/18/2017	06/18/2017

## 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.

Answer:



The screenshot shows a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a command prompt. Below the toolbar, the SQL query is entered in a text area:

```
1 SELECT id "Inventory ID", cost "Cost", units "Units"
2 FROM inventory_list
3 WHERE cost BETWEEN 3.00 AND 15.00;
```

Below the query editor, there is a tabbed interface with 'Results' selected. The results are displayed in a table with three columns: 'Inventory ID', 'Cost', and 'Units'. The table contains two rows of data.

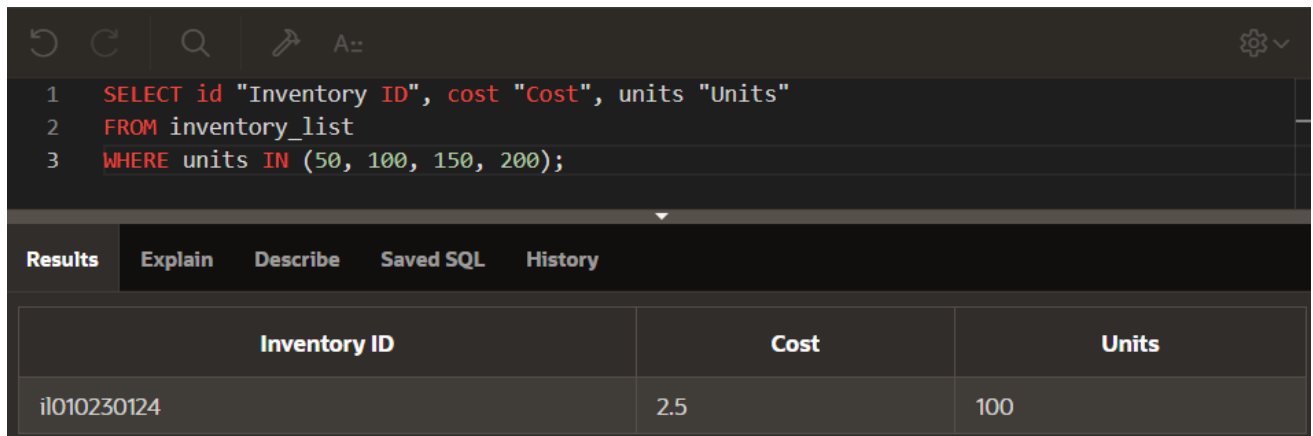
Inventory ID	Cost	Units
il010230125	7.99	250
il010230126	5.24	87



### 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.

Answer:



The screenshot shows a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a command prompt. Below the toolbar, the SQL query is entered in a text area:

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

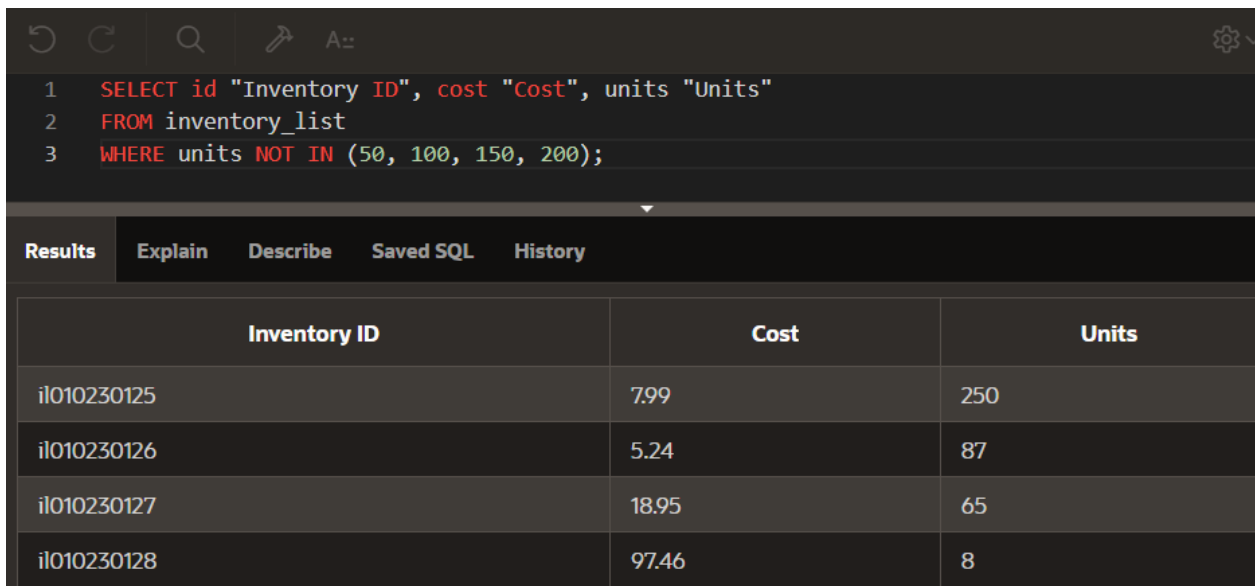
Below the query editor, there is a tabbed interface with 'Results' selected. The results are displayed in a table with three columns: 'Inventory ID', 'Cost', and 'Units'.

Inventory ID	Cost	Units
il010230124	2.5	100

### 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.

Answer:



The screenshot shows a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a command prompt. Below the toolbar, the SQL query is entered in a text area:

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

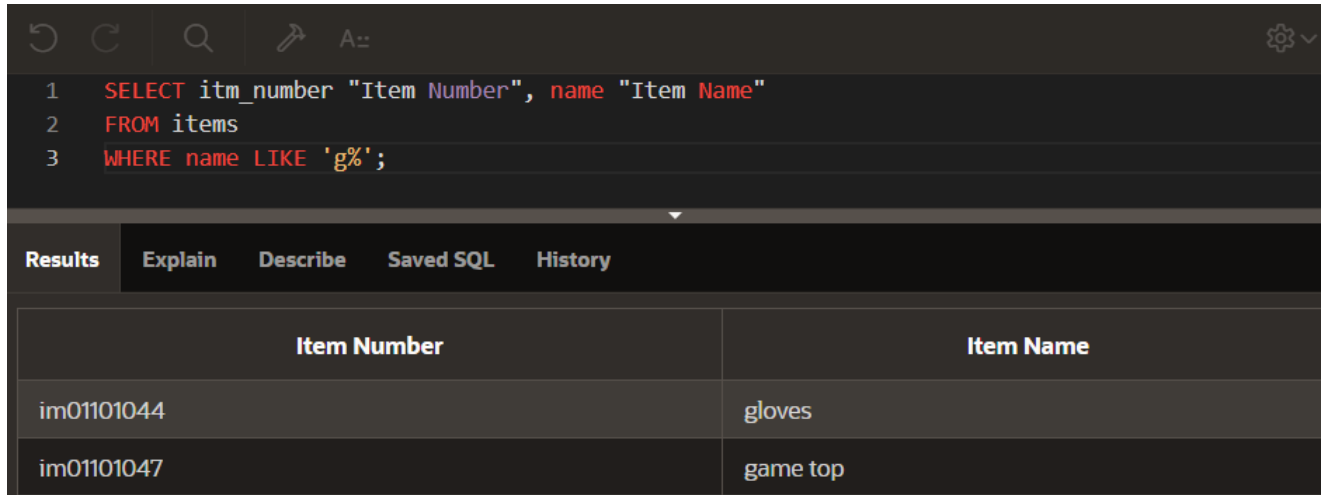
Below the query editor, there is a tabbed interface with 'Results' selected. The results are displayed in a table with three columns: 'Inventory ID', 'Cost', and 'Units'.

Inventory ID	Cost	Units
il010230125	7.99	250
il010230126	5.24	87
il010230127	18.95	65
il010230128	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.

Answer:



The screenshot shows a SQL IDE interface. The top toolbar contains icons for undo, redo, search, and a command prompt. The SQL editor contains the following query:

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

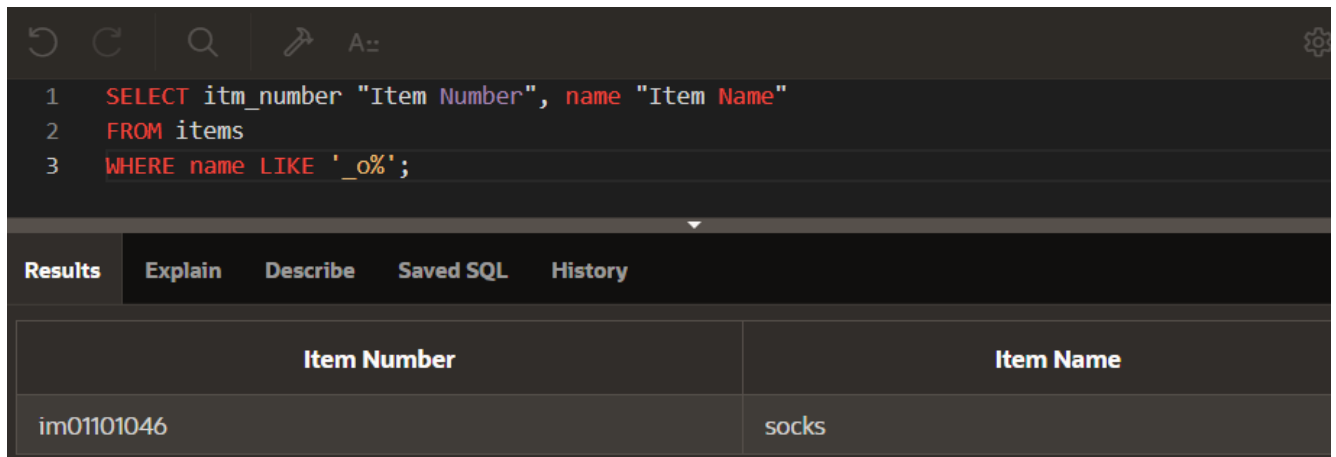
Below the editor is a tabbed interface with 'Results' selected. The results are displayed in a table with two columns: 'Item Number' and 'Item Name'.

Item Number	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.

Answer:



The screenshot shows a SQL IDE interface. The top toolbar contains icons for undo, redo, search, and a command prompt. The SQL editor contains the following query:

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

Below the editor is a tabbed interface with 'Results' selected. The results are displayed in a table with two columns: 'Item Number' and 'Item Name'.

Item Number	Item Name
im01101046	socks

## Section 6 Lesson 7 Exercise 2: Restricting Data Using WHERE

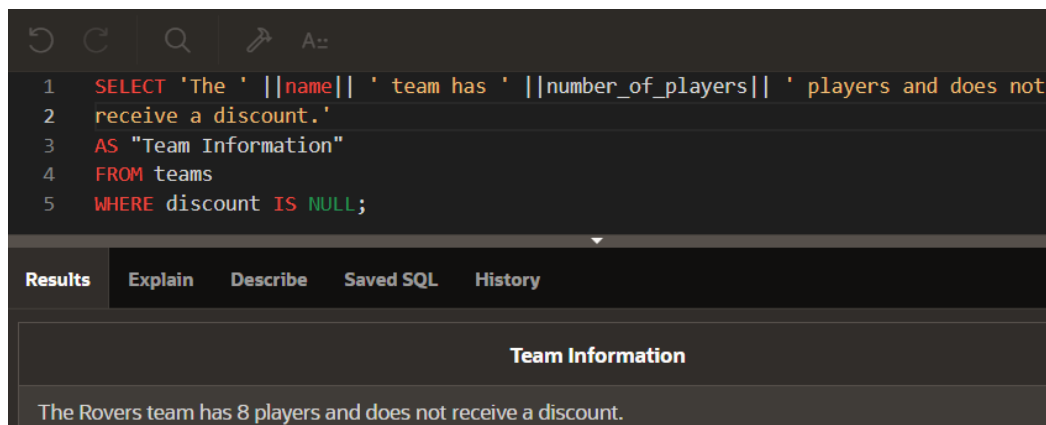
### Limit rows using WHERE (S6L7 Objective 1)

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.

Answer:

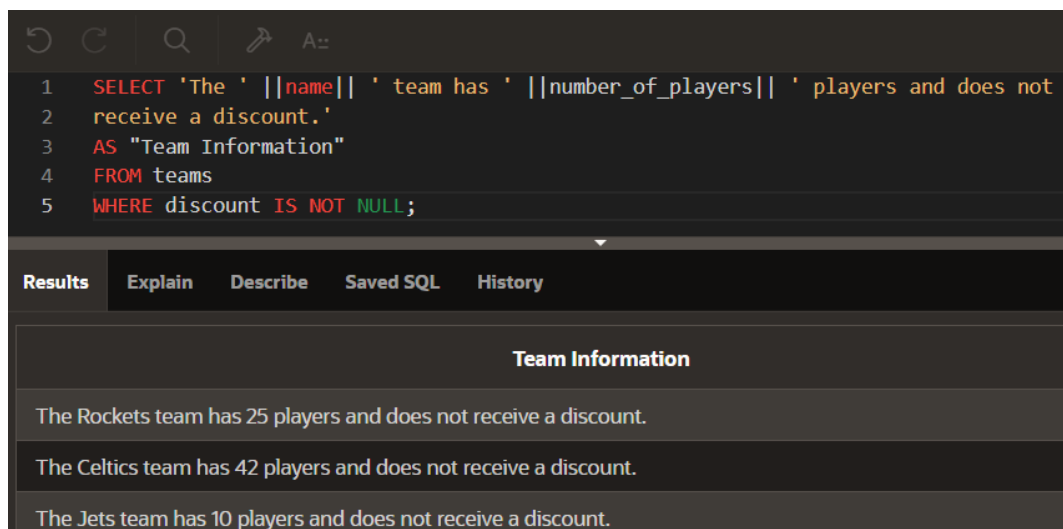


```
1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and does not
2 receive a discount.'
3 AS "Team Information"
4 FROM teams
5 WHERE discount IS NULL;
```

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.

Answer:



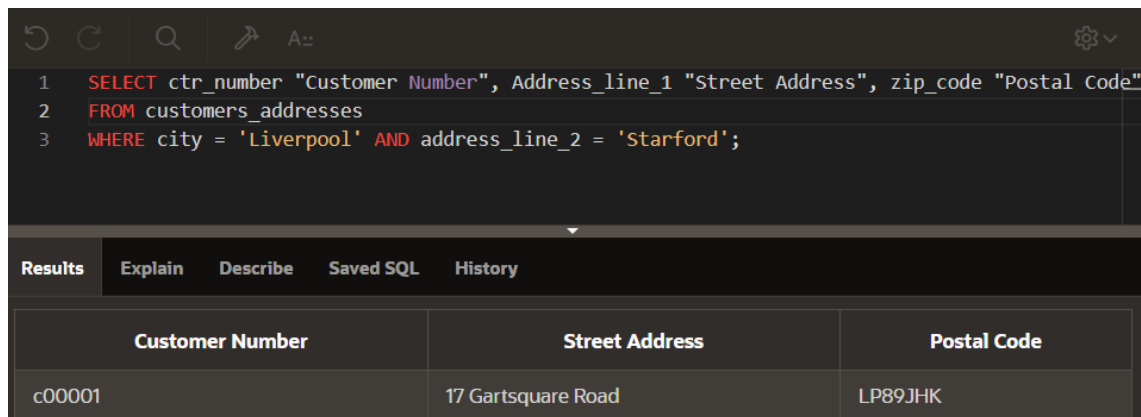
```
1 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and does not
2 receive a discount.'
3 AS "Team Information"
4 FROM teams
5 WHERE discount IS NOT NULL;
```

Team Information
The Rockets team has 25 players and does not receive a discount.
The Celtics team has 42 players and does not receive a discount.
The Jets team has 10 players and does not receive a discount.

## 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.

Answer:



The screenshot shows a SQL query editor with the following query:

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

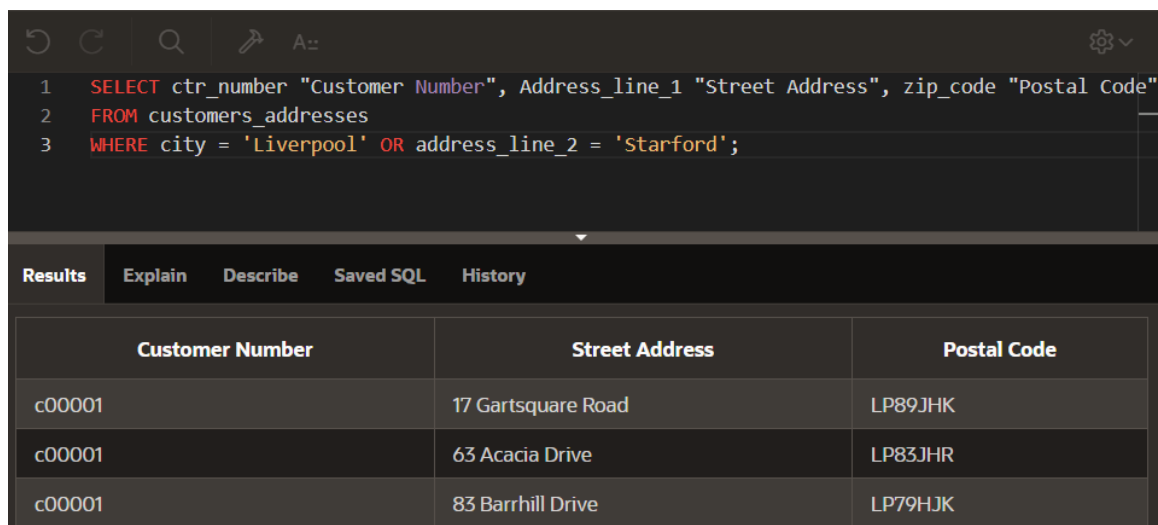
Below the query editor, the results are displayed in a table with the following structure:

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.

Answer:



The screenshot shows a SQL query editor with the following query:

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

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

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK
c00001	63 Acacia Drive	LP83JHR
c00001	83 Barrhill Drive	LP79HJK

#### 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.

Answer:



The screenshot shows a SQL IDE interface. The top panel contains a SQL query:

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

Below the query editor, there is a tabbed interface with "Results" selected. The results are displayed in a table with three columns: "Customer Number", "Street Address", and "Postal Code".

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

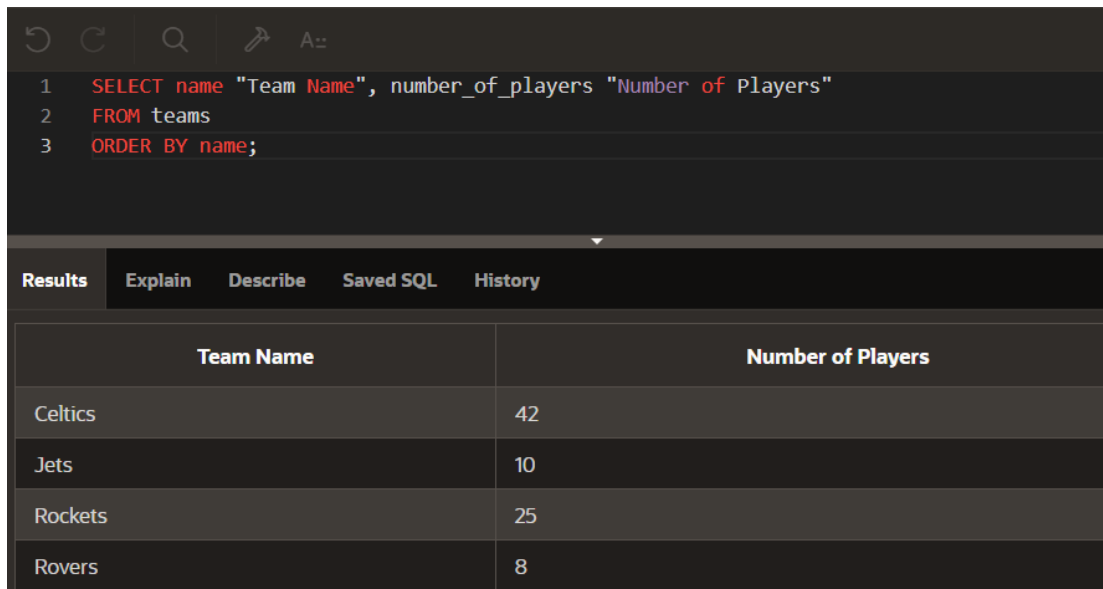
## Section 6 Lesson 8 Exercise 1: Sorting Data Using ORDER BY

### 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.

Answer:



The screenshot shows a SQL IDE interface. At the top, there are icons for undo, redo, search, and a keyboard shortcut 'A:'. Below these is a SQL query editor with the following code:

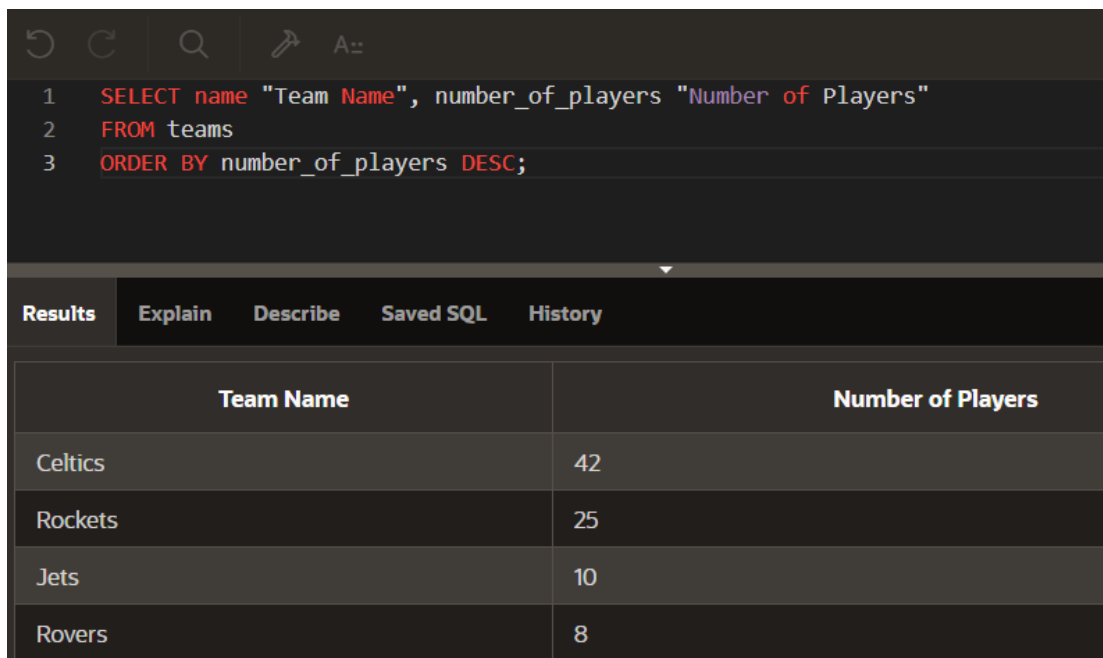
```
1 SELECT name "Team Name", number_of_players "Number of Players"
2 FROM teams
3 ORDER BY name;
```

Below the query editor is a tabbed interface with 'Results' selected. The results are displayed in a table with two columns: 'Team Name' and 'Number of Players'. The data is sorted alphabetically by team name.

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.

Answer:



The screenshot shows a SQL IDE interface. At the top, there are icons for undo, redo, search, and a keyboard shortcut 'A:'. Below these is a SQL query editor with the following code:

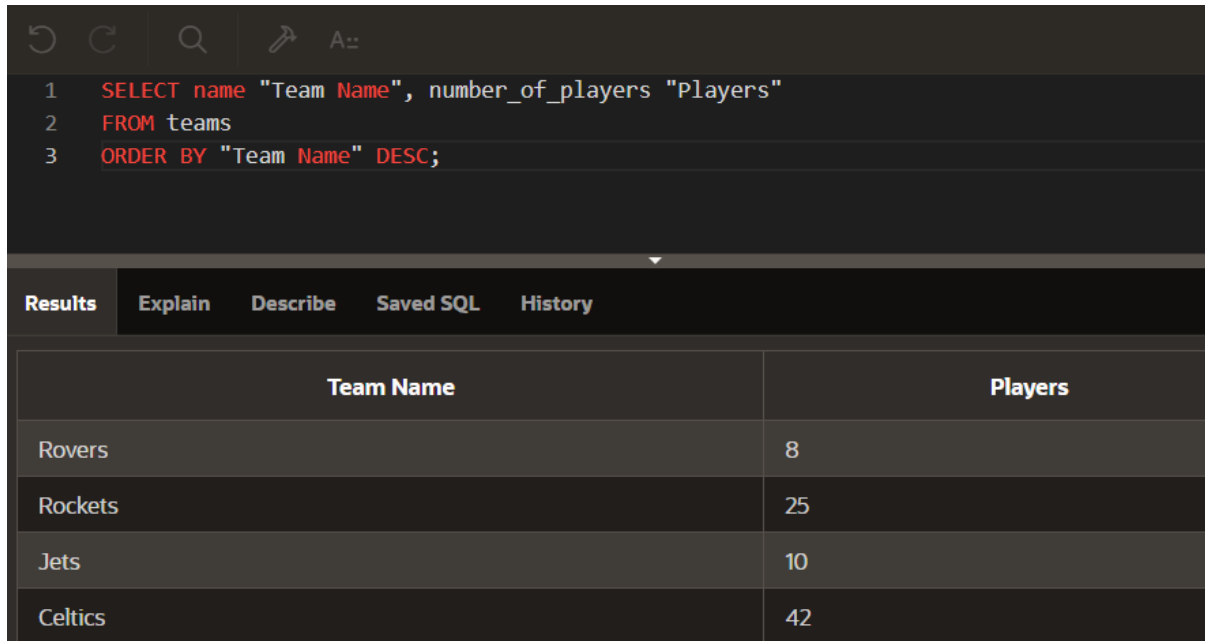
```
1 SELECT name "Team Name", number_of_players "Number of Players"
2 FROM teams
3 ORDER BY number_of_players DESC;
```

Below the query editor is a tabbed interface with 'Results' selected. The results are displayed in a table with two columns: 'Team Name' and 'Number of Players'. The data is sorted in descending order of the number of players.

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.

Answer:



The screenshot shows a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a keyboard shortcut 'A:'. Below the toolbar, the SQL query is entered in three lines:

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

Below the query editor, there is a tabbed interface with four tabs: 'Results' (selected), 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab displays the output of the query in a table format:

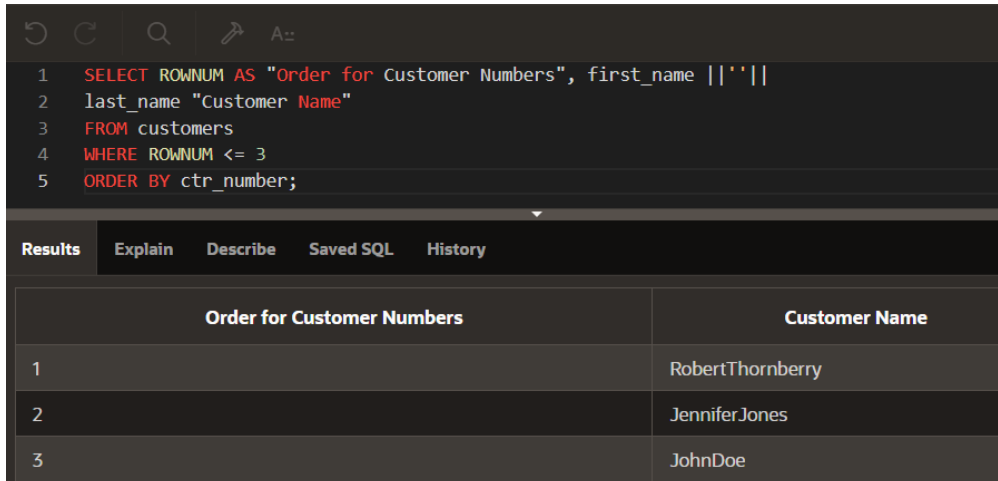
Team Name	Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

## 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.

Answer:



The screenshot shows a SQL IDE with a query editor and a results pane. The query in the editor is:

```
1 SELECT ROWNUM AS "Order for Customer Numbers", first_name || ' ' ||  
2 last_name "Customer Name"  
3 FROM customers  
4 WHERE ROWNUM <= 3  
5 ORDER BY ctr_number;
```

The results pane shows the following data:

Order for Customer Numbers	Customer Name
1	RobertThornberry
2	JenniferJones
3	JohnDoe



## 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.

Answer:

Bind Variable	Value
:COMMISSION_RATE	5

```
1  SELECT first_name || ' ' || last_name "Sales Representative Name"
2  FROM sales_representatives
3  WHERE commission_rate = :commission_rate
4  ORDER BY last_name;
```

Results	Explain	Describe	Saved SQL	History
<b>Sales Representative Name</b>				
BarrySpeed				
VictoriaWright				