



# **DATABASE (SECD 2523-10)**

## **LAB EXERCISE 3 (DML2)**

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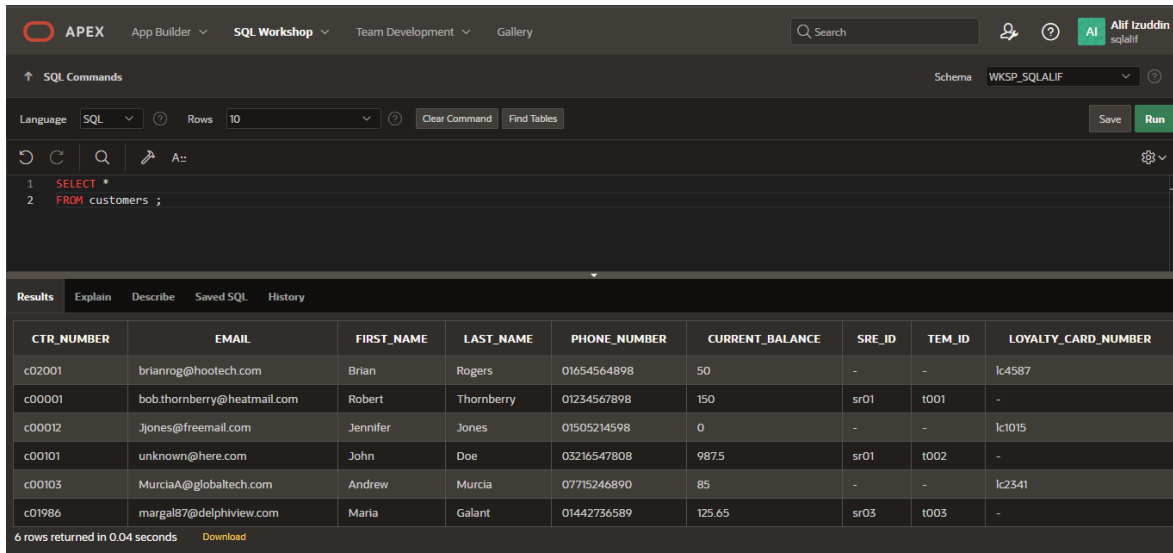
**A22EC0202**

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

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

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

1. customers.

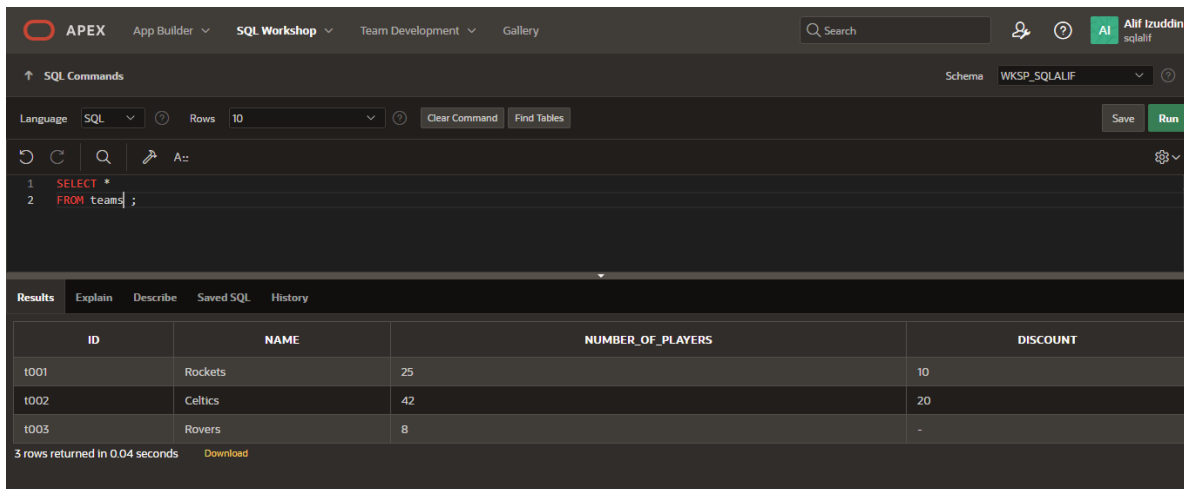


The screenshot shows the APEX SQL Workshop interface. The SQL command entered is `SELECT * FROM customers ;`. The results are displayed in a table with 9 columns: CTR\_NUMBER, EMAIL, FIRST\_NAME, LAST\_NAME, PHONE\_NUMBER, CURRENT\_BALANCE, SRE\_ID, TEM\_ID, and LOYALTY\_CARD\_NUMBER. There are 6 rows of data.

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
c02001	brianrog@hooitech.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	-

6 rows returned in 0.04 seconds [Download](#)

2. teams



The screenshot shows the APEX SQL Workshop interface. The SQL command entered is `SELECT * FROM teams ;`. The results are displayed in a table with 4 columns: ID, NAME, NUMBER\_OF\_PLAYERS, and DISCOUNT. There are 3 rows of data.

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

3 rows returned in 0.04 seconds [Download](#)

### 3. items

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

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

The results tab is active, displaying a table with 5 rows. The columns are: ITM\_NUMBER, NAME, DESCRIPTION, CATEGORY, COLOR, Size, and ILT\_ID.

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 quaity basball bat	equipment	-	-	il010230128

5 rows returned in 0.03 seconds

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

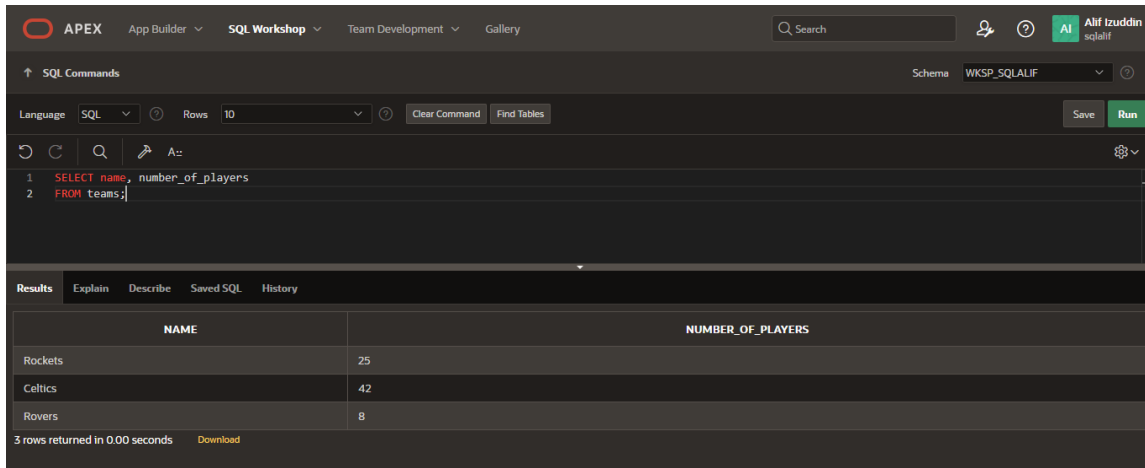
```
1 SELECT ctr_number, first_name, last_name, email, phone_number
2 FROM customers;
```

The results tab is active, displaying a table with 6 rows. The columns are: CTR\_NUMBER, FIRST\_NAME, LAST\_NAME, EMAIL, and PHONE\_NUMBER.

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 0.01 seconds

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

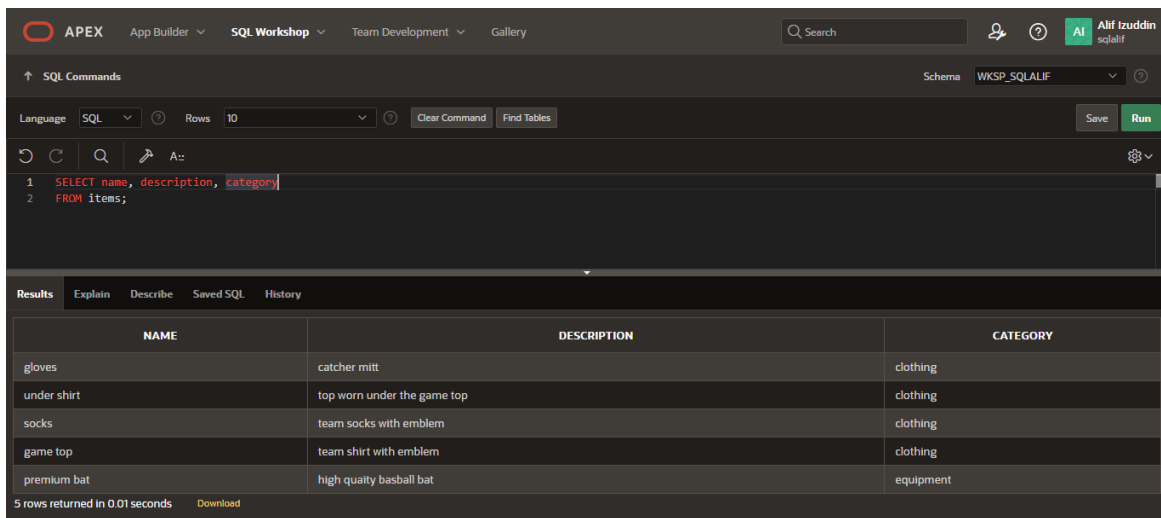


The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'Alif Izuddin' are on the right. The 'SQL Commands' section shows a query: `SELECT name, number_of_players FROM teams;`. The 'Results' tab displays a table with two columns: 'NAME' and 'NUMBER\_OF\_PLAYERS'. The table contains three rows: 'Rockets' with 25 players, 'Celtics' with 42 players, and 'Rovers' with 8 players. A status bar at the bottom indicates '3 rows returned in 0.00 seconds' and a 'Download' link.

NAME	NUMBER_OF_PLAYERS
Rockets	25
Celtics	42
Rovers	8

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

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



The screenshot shows the APEX SQL Workshop interface. The top navigation bar is the same as the previous screenshot. The 'SQL Commands' section shows a query: `SELECT name, description, category FROM items;`. The 'Results' tab displays a table with three columns: 'NAME', 'DESCRIPTION', and 'CATEGORY'. The table contains five rows: '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), and 'premium bat' (high quality baseball bat, equipment). A status bar at the bottom indicates '5 rows returned in 0.01 seconds' and a 'Download' link.

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

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

## Section 6 Lesson 6 Exercise 2: Retrieving Data Using SELECT

### Part 1: Using Arithmetic Operators

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

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

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

```
1 SELECT
2   first_name,
3   last_name,
4   current_balance,
5   current_balance / 12 AS monthly_payment
6 FROM customers;
```

The results are displayed in a table with 6 rows:

FIRST_NAME	LAST_NAME	CURRENT_BALANCE	MONTHLY_PAYMENT
Brian	Rogers	50	4.166666666666666666666666666667
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.2916666666666666666666666667
Andrew	Murcia	85	7.083333333333333333333333333333
Maria	Galant	125.65	10.470833333333333333333333333333

6 rows returned in 0.01 seconds

2. Write a query that will show the customers first name, last name, customer number, current balance and the value of their balance minus the gift value

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

```
1 SELECT
2   first_name,
3   last_name,
4   ctr_number,
5   current_balance,
6   current_balance - 5.00 AS balance_after_gift
7 FROM customers;
```

The results are displayed in a table with 6 rows:

FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE	BALANCE_AFTER_GIFT
Brian	Rogers	c02001	50	45
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

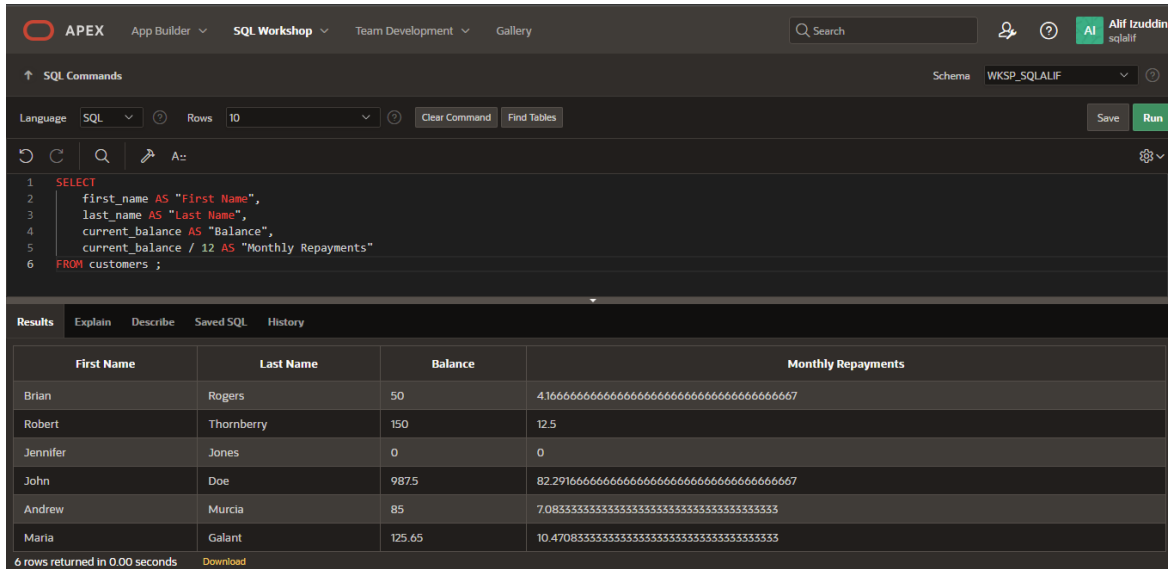
6 rows returned in 0.04 seconds

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

If a large number of customers take advantage of the gift card offer, it could have a financial impact on the company.

## 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).



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

```
1 SELECT
2   first_name AS "First Name",
3   last_name AS "Last Name",
4   current_balance AS "Balance",
5   current_balance / 12 AS "Monthly Repayments"
6 FROM customers ;
```

The Results tab shows the following data:

First Name	Last Name	Balance	Monthly Repayments
Brian	Rogers	50	4.1666666666666666666666666666667
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.291666666666666666666666666667
Andrew	Murcia	85	7.0833333333333333333333333333333
Maria	Galant	125.65	10.4708333333333333333333333333333

6 rows returned in 0.00 seconds

## 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.

SQL Commands

```

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

```

Results

Team Information
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.

3 rows returned in 0.02 seconds

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

The last team might not show a discount because the discount value for that team in the teams table is NULL.

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

### Part 1: Using the WHERE Clause.

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

SQL Commands

```

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

```

Results

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	tt003	-

1 rows returned in 0.01 seconds

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

APEX App Builder SQL Workshop Team Development Gallery

Search

AI Alif Izuddin sqalif

SQL Commands Schema WKSP\_SQLALIF

Language SQL Rows 10 Clear Command Find Tables Save Run

```

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

```

Results Explain Describe Saved SQL History

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

3 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.

APEX App Builder SQL Workshop Team Development Gallery

Search

AI Alif Izuddin sqalif

SQL Commands Schema WKSP\_SQLALIF

Language SQL Rows 10 Clear Command Find Tables Save Run

```

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

```

Results Explain Describe Saved SQL History

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

5 rows returned in 0.03 seconds Download



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

```
1 SELECT
2   id AS "Inventory ID",
3   cost AS "Cost",
4   units AS "Number of Units"
5 FROM inventory_list
6 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 0.02 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 APEX SQL Workshop interface. The SQL command area contains the following query:

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

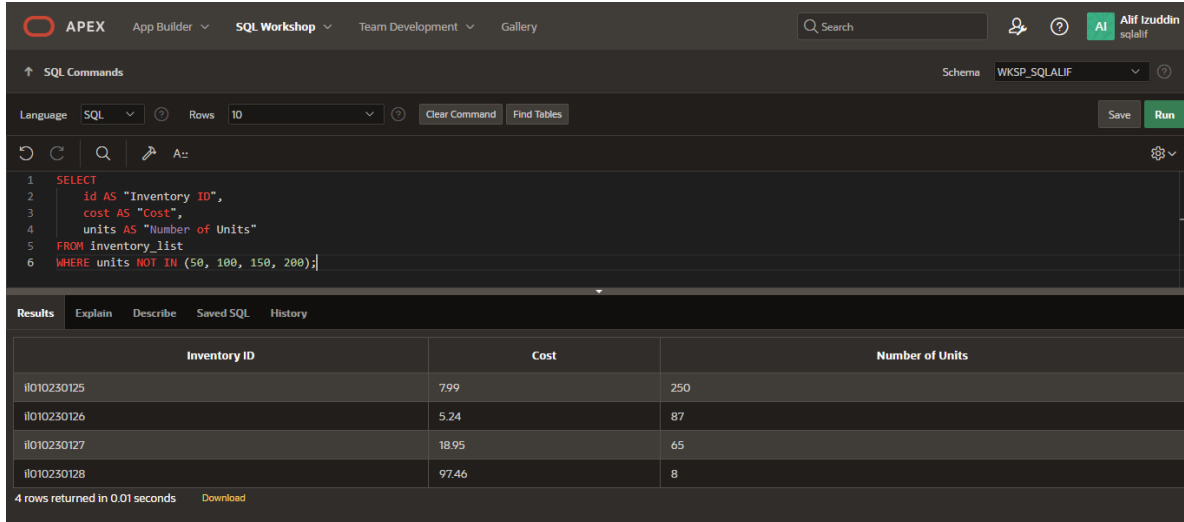
The Results tab shows the following data:

Inventory ID	Cost	Number of Units
IL010230124	2.5	100

1 rows returned in 0.00 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 APEX SQL Workshop interface. The SQL command area contains the following query:

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

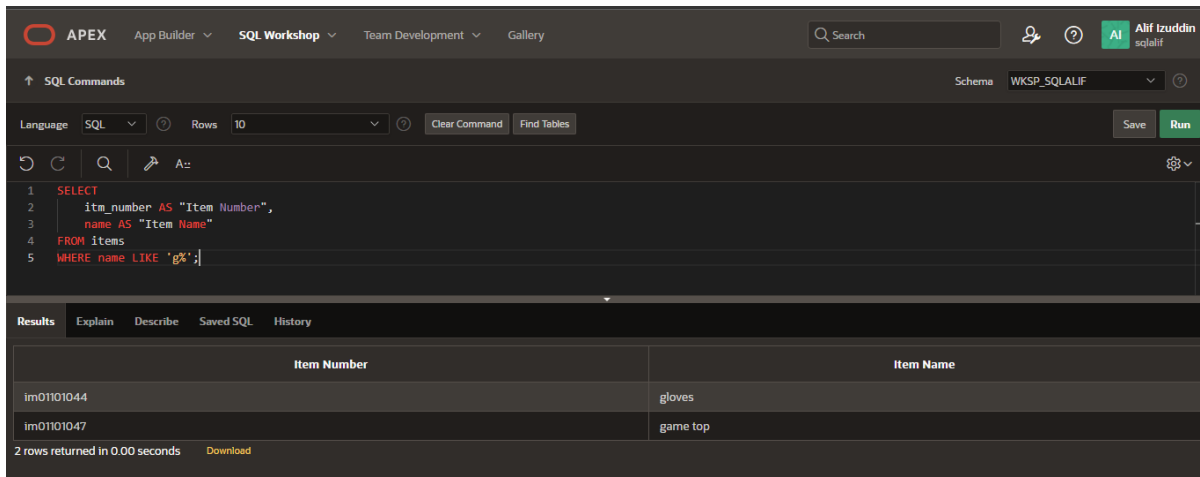
The Results tab displays the following data:

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

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

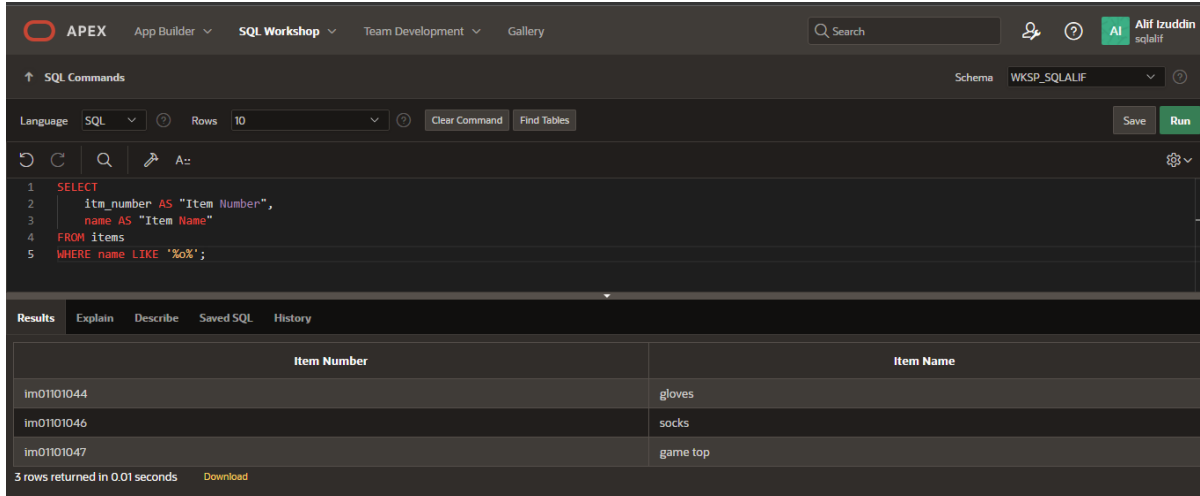
The Results tab displays the following data:

Item Number	Item Name
im010101044	gloves
im010101047	game top

2 rows returned in 0.00 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 APEX SQL Workshop interface. The SQL command area contains the following query:

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

The Results tab shows the following data:

Item Number	Item Name
Im01101044	gloves
Im01101046	socks
Im01101047	game top

3 rows returned in 0.01 seconds

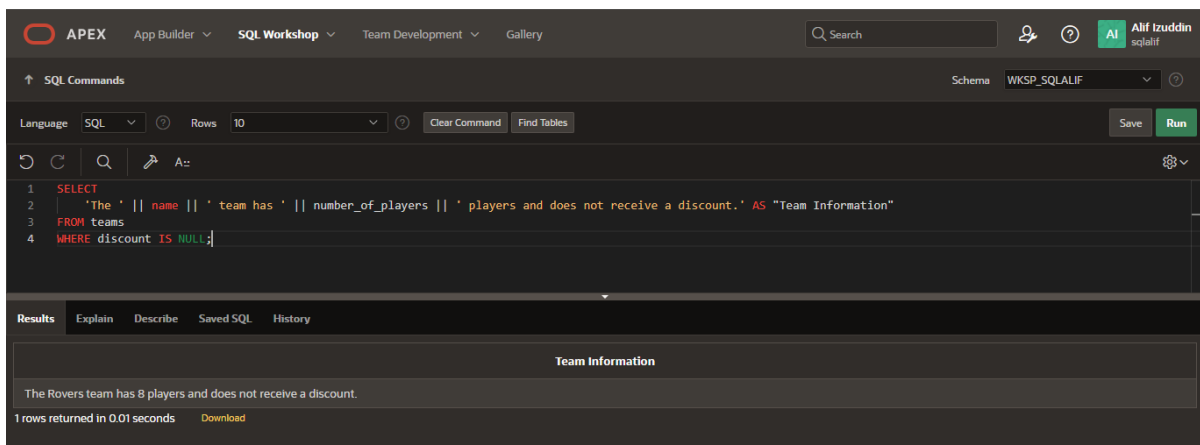
## Section 6 Lesson 7 Exercise 2: Restricting Data Using WHERE

### Part 1: Using the NULL Conditions

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

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

Use Team Information as the column alias.



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

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

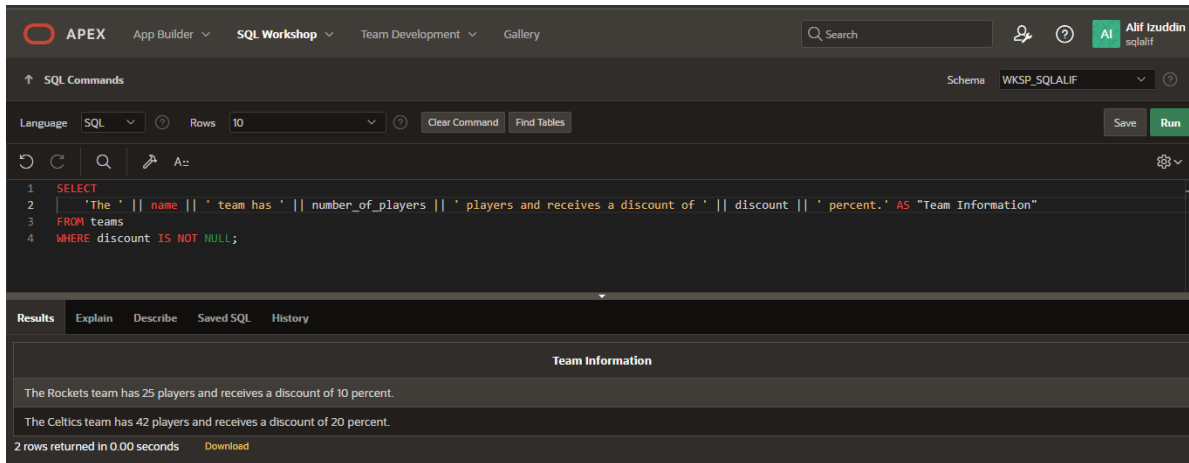
The Results tab shows the following data:

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

1 rows returned in 0.01 seconds

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

The Rockets team has 25 players and receives a discount of 10 percent. Use Team Information as the column alias.



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

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

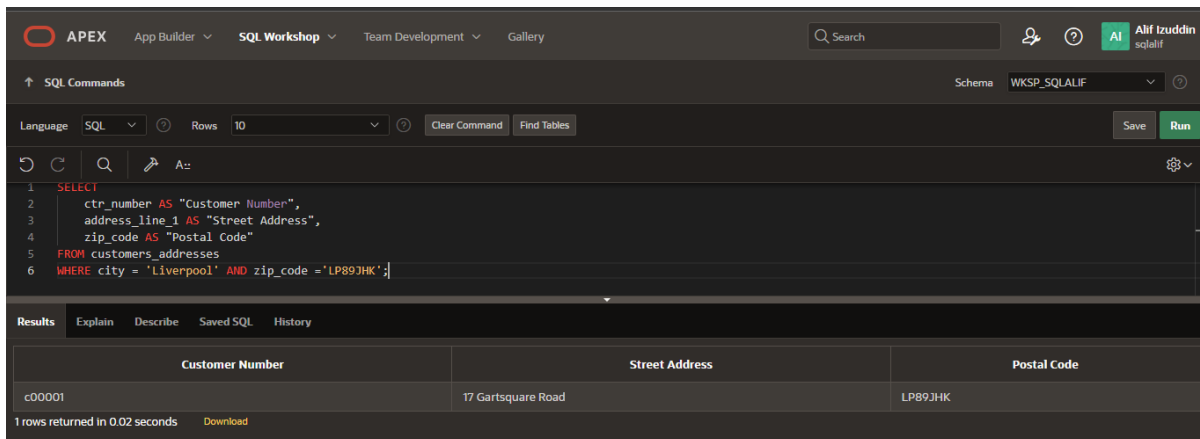
The results tab shows the following output:

Team Information
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.

2 rows returned in 0.00 seconds

## Part 2: Logical Operators: AND

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



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

```
1 SELECT
2   ctr_number AS "Customer Number",
3   address_line_1 AS "Street Address",
4   zip_code AS "Postal Code"
5 FROM customers_addresses
6 WHERE city = 'Liverpool' AND zip_code = 'LP89JHK';
```

The results tab shows the following output:

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK

1 rows returned in 0.02 seconds

### Part 3: Logical Operators: OR

1. Write a query that will display the customer number, address line 1 and postal code for customers that live in either Starford or Liverpool in general.

Use Customer Number, Street Address and Postal Code as the column aliases

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

```
1 SELECT
2   c.ctr_number AS "Customer Number",
3   ca.address_line_1 AS "Street Address",
4   ca.zip_code AS "Postal Code"
5 FROM
6   customers c
7 JOIN
8   customers_addresses ca ON c.ctr_number = ca.ctr_number
9 WHERE
10  ca.city = 'Starford' OR ca.city = 'Liverpool';
```

The Results tab shows the following data:

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

2 rows returned in 0.00 seconds

### Part 4: Logical Operators: NOT Equal To

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

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

```
1 SELECT
2   c.ctr_number AS "Customer Number",
3   ca.address_line_1 AS "Street Address",
4   ca.zip_code AS "Postal Code"
5 FROM
6   customers c
7 JOIN
8   customers_addresses ca ON c.ctr_number = ca.ctr_number
9 WHERE
10  ca.city <> 'Liverpool';
```

The Results tab shows the following data:

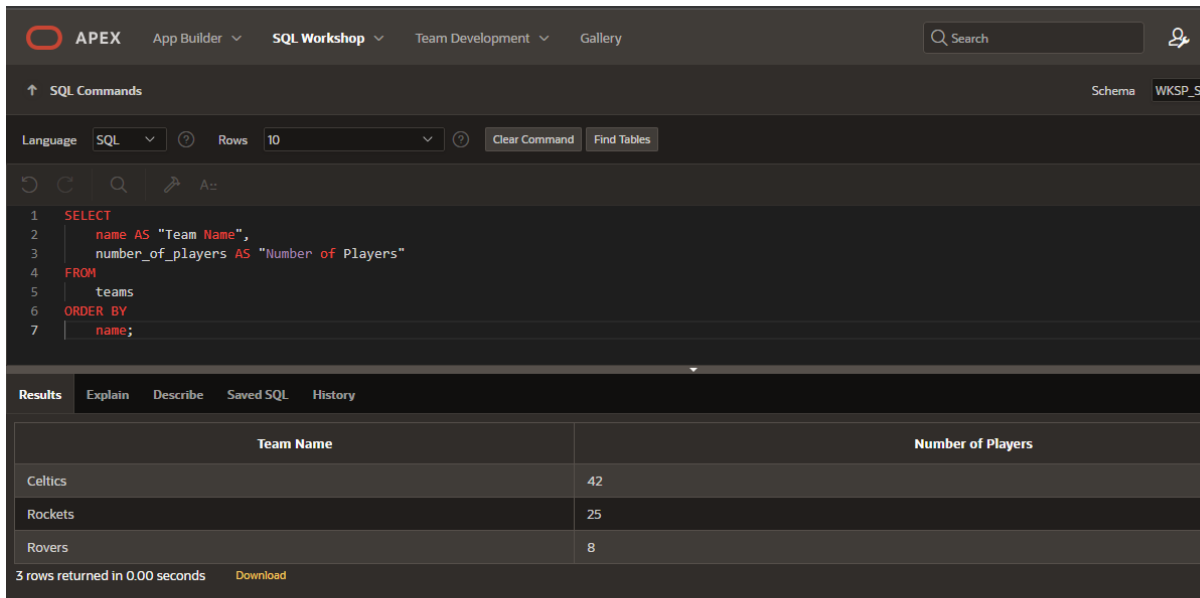
Customer Number	Street Address	Postal Code
c00101	54 Ropehill Crescent	ST45AGV
c01986	36 Watercross Lane	JP23YTH

2 rows returned in 0.01 seconds

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

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 top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar is on the right. Below the navigation bar, the 'SQL Commands' tab is active. The 'Language' is set to 'SQL' and 'Rows' is set to '10'. The SQL command area contains the following query:

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

Below the SQL command area, the 'Results' tab is active. It shows a table with two columns: 'Team Name' and 'Number of Players'. The table contains three rows of data:

Team Name	Number of Players
Celtics	42
Rockets	25
Rovers	8

At the bottom of the results section, it states '3 rows returned in 0.00 seconds' and provides a 'Download' link.

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

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

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

The Results tab is active, displaying a table with the following data:

Team Name	Number of Players
Celtics	42
Rockets	25
Rovers	8

3 rows returned in 0.01 seconds. A Download link is available.

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

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

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

The Results tab is active, displaying a table with the following data:

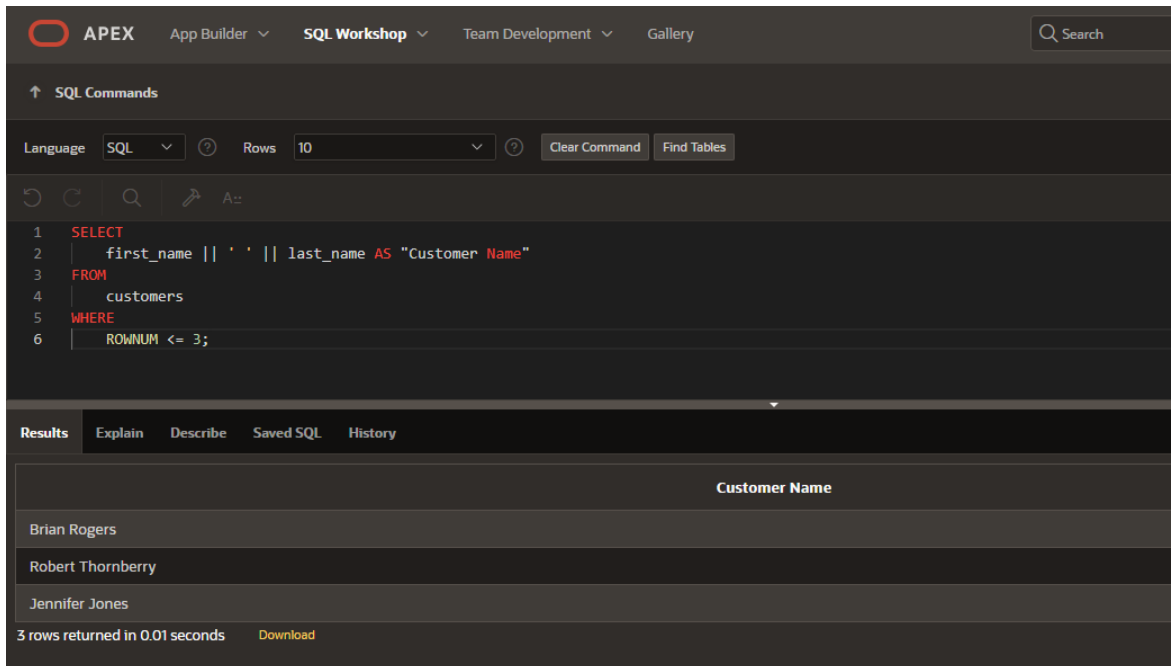
Team Name	Players
Rovers	8
Rockets	25
Celtics	42

3 rows returned in 0.01 seconds. A Download link is available.

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

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

1. The customers are numbered sequentially with each new customer being assigned a higher customer number. Use TOP-N-ANALYSIS to only show the First and last name of the first three customers. Show the customers first and last name in the same column using Customer Name as the column alias



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar is on the right. Below the navigation bar, the 'SQL Commands' section is active. It shows a SQL query in a text editor with line numbers 1 through 6. The query is:   
1 SELECT  
2 first\_name || ' ' || last\_name AS "Customer Name"  
3 FROM  
4 customers  
5 WHERE  
6 ROWNUM <= 3;  
Below the editor, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Results' tab is selected, showing a table with one column, 'Customer Name'. The table contains three rows of data: 'Brian Rogers', 'Robert Thornberry', and 'Jennifer Jones'. At the bottom of the results section, it says '3 rows returned in 0.01 seconds' and there is a 'Download' link.

```
1 SELECT
2 first_name || ' ' || last_name AS "Customer Name"
3 FROM
4 customers
5 WHERE
6 ROWNUM <= 3;
```

Customer Name
Brian Rogers
Robert Thornberry
Jennifer Jones

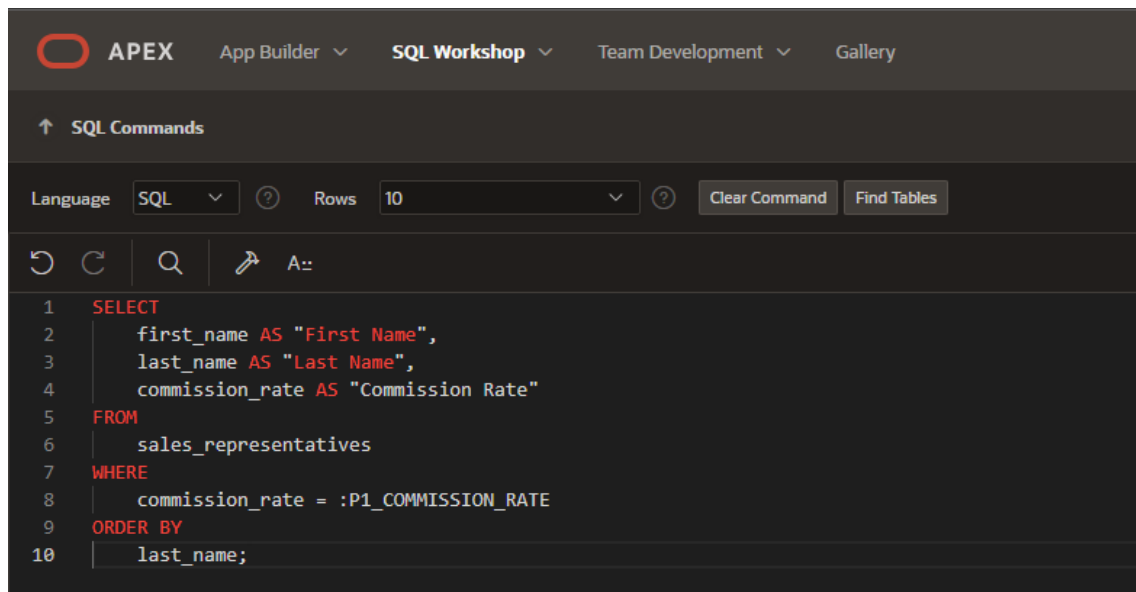
3 rows returned in 0.01 seconds [Download](#)



## 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.

### SQL query



The screenshot shows the APEX SQL Workshop interface. At the top, there are navigation tabs: APEX, App Builder, SQL Workshop (selected), Team Development, and Gallery. Below the tabs is a section for SQL Commands. The interface includes a Language dropdown set to SQL, a Rows dropdown set to 10, and buttons for Clear Command and Find Tables. The main area contains an SQL query with line numbers 1 through 10. The query is as follows:

```
1  SELECT
2      first_name AS "First Name",
3      last_name AS "Last Name",
4      commission_rate AS "Commission Rate"
5  FROM
6      sales_representatives
7  WHERE
8      commission_rate = :P1_COMMISSION_RATE
9  ORDER BY
10     last_name;
```

## Input window

Bind Variable	Value
:P1_COMMISSION_RATE	5

## Output

```
1  SELECT
2      first_name AS "First Name",
3      last_name AS "Last Name",
4      commission_rate AS "Commission Rate"
5  FROM
6      sales_representatives
7  WHERE
8      commission_rate = :P1_COMMISSION_RATE
9  ORDER BY
10     last_name;
```

First Name	Last Name	Commission Rate
Barry	Speed	5
Victoria	Wright	5

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