



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

DATA BASE (SECD2523-06)
LAB 3 : SQL 3-DML2

SECTION:	06
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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.

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.
2. teams.
3. items

Part 2: Selecting Specific Columns

1. Display the customer number, first name, last name, email and phone number of the customers.
2. Display the name and number of players for each team.
3. Display the name, description and category for every item in the table.

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;**

1 SELECT* FROM CUSTOMERS;								
Results Explain Describe Saved SQL History								
CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_NUMBER
c00105	MurciaA@globaltech.com	Andrew	Murcia	0775246890	85	-	-	lc2541
c00001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
c02001	briannog@hootech.com	Brian	Rogers	01654564898	50	-	-	lc4587
c00012	Jjones@fremail.com	Jennifer	Jones	01505214598	0	-	-	lc1015
c01986	margal87@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-
c00101	unknown@here.com	John	Doe	05216547808	987.5	sr01	t002	-

2. teams.

- **SELECT* FROM TEAMS;**

2 SELECT* FROM TEAMS;			
Results Explain Describe Saved SQL History			
ID	NAME	NUMBER_OF_PLAYERS	DISCOUNT
t001	Rockets	25	10
t002	Celtics	42	20
t003	Rovers	8	-
t004	Jets	10	5

3. items

- **SELECT* FROM ITEMS;**

3 SELECT* FROM ITEMS;							
Results Explain Describe Saved SQL History							
ITEM_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 quality baseball bat	equipment	-	-	il010230128	

Part 2: Selecting Specific Columns

1. 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;**

Results			
CTR_NUMBER	FIRST_NAME	EMAIL	PHONE_NUMBER
c00105	Andrew	MurciaA@globaltech.com	0775246890
c00001	Robert	bob.thornberry@hotmail.com	01234567898
c02001	Brian	brianrog@hootech.com	01654564898
c00012	Jennifer	Jjones@freemail.com	01505214598
c01986	Maria	margal87@ddlpview.com	01442756589
c00101	John	unknown@here.com	03216547808

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

- **SELECT name, number_of_players FROM TEAMS;**

Results	
NAME	NUMBER_OF_PLAYERS
Rockets	25
Celtics	42
Rovers	8
Jets	10

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

- **SELECT name, description, category FROM ITEMS;**

Results		
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

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

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).

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?

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 / 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 - 5 FROM CUSTOMERS ;

Results	Explain	Describe	Saved SQL	History
FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE-5	
Andrew	Murcia	c00103	80	
Robert	Thornberry	c00001	145	
Brian	Rogers	c02001	45	
Jennifer	Jones	c00012	-5	
Maria	Galant	c01986	120.65	
John	Doe	c00101	982.5	

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

- Current balance cannot be 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).

- SELECT first-name AS "First Name", last-name AS "Last Name",
current_balance AS "Balance", current_balance/12 AS "Monthly Payment" 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 || 'players and receives a discount of ' || discount || ' percent.' AS "Team Information" FROM TEAMS;

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

Results Explain Describe Saved SQL History

Team Information

TheRocketsteam has 25 players and receives a discount of 10 percent.

TheCelticsteam has 42 players and receives a discount of 20 percent.

TheRoversteam has 8 players and receives a discount of percent.

TheJetsteam has 10 players and receives a discount of 5 percent.

4 rows returned in 0.02 seconds [Download](#)

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

- "discount" column allows NULL value, teams that contains 0 may not show the discount value in the result.

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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.
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.
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.

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.

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.

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.

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.

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.

Part 1: Using the WHERE Clause.

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

- `SELECT * FROM CUSTOMERS 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	t003	-

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

- 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", ctr_number AS "Customer Number" FROM CUSTOMERS WHERE current_balance > 100 ;`

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

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

- 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", odr_time AS "Order Time" FROM ORDERS WHERE TO_DATE(odr_date,'MM/DD/YYYY') < TO_DATE('05/28/2019','MM/DD/YYYY');`

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

5 rows returned in 0.03 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"
FROM INVENTORY_LIST WHERE cost BETWEEN 3.00 AND 15.00;*

5 SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units" from INVENTORY_LIST WHERE cost BETWEEN 3.00 AND 15.00;			
Results	Explain	Describe	Saved SQL History
Inventory ID			Cost
il010230125		7.99	250
il010230126		5.24	87
2 rows returned in 0.00 seconds			Download

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"
FROM INVENTORY_LIST WHERE units IN(50,100,150,200);*

4 SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units" from INVENTORY_LIST WHERE units IN(50,100,150,200);			
Results	Explain	Describe	Saved SQL History
Inventory ID			Cost
il010230124		2.5	100
1 rows returned in 0.03 seconds			Download

Part 4: Membership Conditions: NOT IN Operator

- 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"
WHERE units NOT IN(50,100,150,200);*

6 SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units" from INVENTORY_LIST WHERE units NOT IN(50,100,150,200);			
Results	Explain	Describe	Saved SQL History
Inventory ID			Cost
il010230125		7.99	250
il010230126		5.24	87
il010230127		18.95	65
il010230128		97.46	8
4 rows returned in 0.01 seconds			Download

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 item_number AS "Item Number", name AS "Name" FROM ITEMS
WHERE name LIKE 'g%';

```
7  SELECT item_number AS "Item Number", name AS "Name" FROM ITEMS WHERE name LIKE 'g%';

Results Explain Describe Saved SQL History



| Item Number | Name     |
|-------------|----------|
| im01101044  | gloves   |
| im01101047  | game top |



2 rows returned in 0.02 seconds Download


```

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 Number", name AS "Name" FROM ITEMS
WHERE name LIKE '_o%';

```
8  SELECT item_number AS "Item Number", name AS "Name" FROM ITEMS WHERE name LIKE '_o%';

Results Explain Describe Saved SQL History



| Item Number | Name  |
|-------------|-------|
| im01101046  | socks |



1 rows returned in 0.03 seconds Download


```

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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.

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.

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.

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.

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;

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

Results Explain Describe Saved SQL History

Team information

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

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

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

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

Use **Team Information** as the column alias.

- 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;

```
10 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;
```

Results Explain Describe Saved SQL History

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 Jets team has 10 players and receiveS a discount OF 5 percent.

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

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.

- 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';

```
11 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';
```

Results Explain Describe Saved SQL History

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK

1 rows returned in 0.05 seconds [Download](#)

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';`

14 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';			
Results	Explain	Describe	Saved SQL History
Customer Number	Street Address	Postal Code	
c00001	63 Acacia Drive	LP83JHR	
c00001	17 Gartsquare Road	LP89JHK	
2 rows returned in 0.02 seconds Download			

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');`

13 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');			
Results	Explain	Describe	Saved SQL History
Customer Number	Street Address	Postal Code	
c00101	54 Ropehill Crescent	ST45AGV	
c01986	36 Watercress Lane	JP23YTH	
2 rows returned in 0.01 seconds Download			

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

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 "Player" FROM TEAMS
ORDER BY name;

15 SELECT name AS "Team Name", number_of_players AS "Player" FROM TEAMS ORDER BY name;	
Results	Explain Describe Saved SQL History
Team Name	Player
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 "Player" FROM TEAMS
ORDER BY numbers_of_players DESC;

16 SELECT name AS "Team Name", number_of_players AS "Player" FROM TEAMS ORDER BY number_of_players DESC;	
Results	Explain Describe Saved SQL History
Team Name	Player
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 "Players" FROM TEAMS
ORDER BY name DESC;

17 SELECT name AS "Team Name", number_of_players AS "Player" FROM TEAMS ORDER BY name DESC;	
Results	Explain Describe Saved SQL History
Team Name	Player
Rovers	8
Rockets	25
Jets	10
Celtics	42

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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.

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

- 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 "Customer Number", first_name || '' || last_name AS "Customer Name" FROM (SELECT first_name, last_name FROM CUSTOMERS) WHERE ROWNUM <= 3;

```
1  SELECT ROWNUM AS "Customer Number", first_name|| '' ||last_name AS "Customer Name" FROM (SELECT first_name, last_name FROM CUSTOMERS) WHERE ROWNUM <=3;
```

Results	Explain	Describe	Saved SQL	History
Customer Number			Customer Name	
1				Andrew Murcia
2				Robert Thornberry
3				Brian Rogers

3 rows returned in 0.03 seconds Download

Part 2 : Using a Substitution Variable (S6L8 Objective 4)

- 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 AS "First Name", last_name AS "Last Name", commission_rate AS "Commission Rate" FROM SALES_REPRESENTATIVES WHERE commission_rate = :commission_rate ORDER BY last_name;

The screenshot shows a web browser window titled "Enter Bind Variables - Google Chrome". The URL is "apex.oracle.com/pls/apex/f?p=4500:138:16085880765140::". A green "Submit" button is visible at the top right. Below it is a table with two columns: "Bind Variable" and "Value". A single row is present with the value ":COMMISSION_RATE" in the "Bind Variable" column and "5" in the "Value" column.

```
1  SELECT first_name AS "First Name", last_name AS "Last Name", commission_rate AS "Commission Rate" FROM SALES_REPRESENTATIVES WHERE commission_rate = :commission_rate ORDER BY last_name;
```

Results	Explain	Describe	Saved SQL	History
First Name	Last Name	Commission Rate		
Barry	Speed	5		
Victoria	Wright	5		

2 rows returned in 0.00 seconds Download