



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Database Lab3:DML2

SECD2523 – 08 Database

Semester 1 2023/2024

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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. customer

```
1 SELECT * FROM customers
2
```

CTR_NUMBER	EMAIL	FIRST_NAME	LAST_NAME	PHONE_NUMBER	CURRENT_BALANCE	SRE_ID	TEM_ID	LOYALTY_CARD_N
c02001	brianrog@hootech.com	Brian	Rogers	01654564898	50	-	-	lc4587
c00001	bob.thornberry@heatmail.com	Robert	Thornberry	01234567898	150	sr01	t001	-
c00012	Jjones@freemail.com	Jennifer	Jones	01505214598	0	-	-	lc1015
c00101	unknown@here.com	John	Doe	03216547808	9875	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 0.02 seconds [Download](#)

2. teams.

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

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

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

3. items

```
1 SELECT * FROM items
2
3
```

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 quaiity basball bat	equipment	-	-	il010230128

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

Part 2: Selecting Specific Columns

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

1

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

Results

ExplainDescribeSaved SQLHistory

CTR_NUMBER	FIRST_NAME	LAST_NAME	EMAIL	PHONE_NUMBER
c02001	Brian	Rogers	brianrog@hoootech.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 0.00 secondsDownload

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

```
1 SELECT name,number_of_players FROM teams;
2
3
```

Results Explain Describe Saved SQL History

NAME	NUMBER_OF_PLAYERS
Jets	10
Rockets	25
Celtics	42
Rovers	8

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

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

1

SELECT name, description, category FROM items;

2

Results

Explain

Describe

Saved SQL

History

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 quaiity baseball bat	equipment

5 rows returned in 0.00 seconds

Download

- 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.

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

Results	Explain	Describe	Saved SQL	History
FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE	CURRENT_BALANCE-5
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 0.01 seconds [Download](#)

- What would be the problem with implementing this scheme?

Jennifer will have negative value since she has 0 current_balance. Her balance will become -5 after deduction

Part 2 : Using Column Aliases

- 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).

Results

Explain

Describe

Saved SQL

History

First Name	Last Name	Balance	Monthly Repayments
Brian	Rogers	50	4.16666666666666666666666666667
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.291666666666666666666666667
Andrew	Murcia	85	7.08333333333333333333333333333
Maria	Galant	125.65	10.47083333333333333333333333333

6 rows returned in 0.01 seconds

Download

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.

Results	Explain	Describe	Saved SQL	History
Team Information				
The Jets team has 10 players and receives a discount of 5 percent.				
The Rockets team has 25 players and receives a discount of 10 percent.				
The Celtics team has 42 players and receives a discount of 20 percent.				
The Rovers team has 8 players and receives a discount of percent.				
4 rows returned in 0.00 seconds				
Download				

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

The value of discount is null. It indicates that the particular column does not have any value or absence of value. Thus, it is does not show a discount.

Part 1: Using the WHERE Clause.

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

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

2

Results

Explain

Describe

Saved SQL

History

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

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.

Language SQL

Rows 10

Clear Command

Find Tables

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

2

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.

1	SELECT id "Order ID",odr_date "Order Date",odr_time "Order Time" FROM orders WHERE odr_date < '05/28/2019';
2	

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

- 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.

1	SELECT id "Inventory ID", cost "Cost",units "Number of units" FROM inventory_list WHERE cost BETWEEN 3.00 AND 15.00;
2	

Results	Explain	Describe	Saved SQL	History
---------	---------	----------	-----------	---------

Inventory ID	Cost	Number of units
il010230125	7.99	250
il010230126	5.24	87

2 rows returned in 0.03 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.

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

Results	Explain	Describe	Saved SQL	History
---------	---------	----------	-----------	---------

Inventory ID	Cost	Number of units
il010230124	2.5	100

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

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.

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

Results	Explain	Describe	Saved SQL	History
---------	---------	----------	-----------	---------

Inventory ID	Cost	Number of units
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.

A::

1

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

2

Results

Explain

Describe

Saved SQL

History

Item Number	Item 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.

1

SELECT itm_number "Item Number", name "Item Name" FROM items WHERE name LIKE '%o%';

2

Results

Explain

Describe

Saved SQL

History

Item Number	Item Name
im01101044	gloves
im01101046	socks
im01101047	game top

3 rows returned in 0.00 seconds

Download

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.

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

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

1 rows returned in 0.02 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.

Language
SQL
10
Clear Command
Find Tables

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

Results
Explain
Describe
Saved SQL
History

Team Information

The Jets team has 10 players and receives a discount of 5 percent.
The Rockets team has 25 players and receives a discount of 10 percent.
The Celtics team has 42 players and receives a discount of 20 percent.

3 rows returned in 0.01 seconds
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Part 2: Logical Operators: AND

- 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.

1 SELECT ctr_number "Customer Number",
2 | address_line_1 "Street Address", zip_code "Postal Code" |
3 FROM customers_addresses
4 WHERE city = 'Liverpool' AND address_line_2 = 'Starford';
5

Results
Explain
Describe
Saved SQL
History

Customer Number	Street Address	Postal Code
c00001	17 Gartsquare Road	LP89JHK

1 rows returned in 0.04 seconds
Download

Part 3: Logical Operators: OR

- 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.

123456

SELECT

ctr_number

"Customer Number",

address_line_1

"Street Address",

zip_code

"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	17 Gartsquare Road	LP89JHK
c00001	63 Acacia Drive	LP83JHR

2 rows returned in 0.01 secondsDownload

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.

LanguageSQLRows10Clear CommandFind TablesSave

123456

SELECT

ctr_number

"Customer Number",

address_line_1

"Street Address",

zip_code

"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

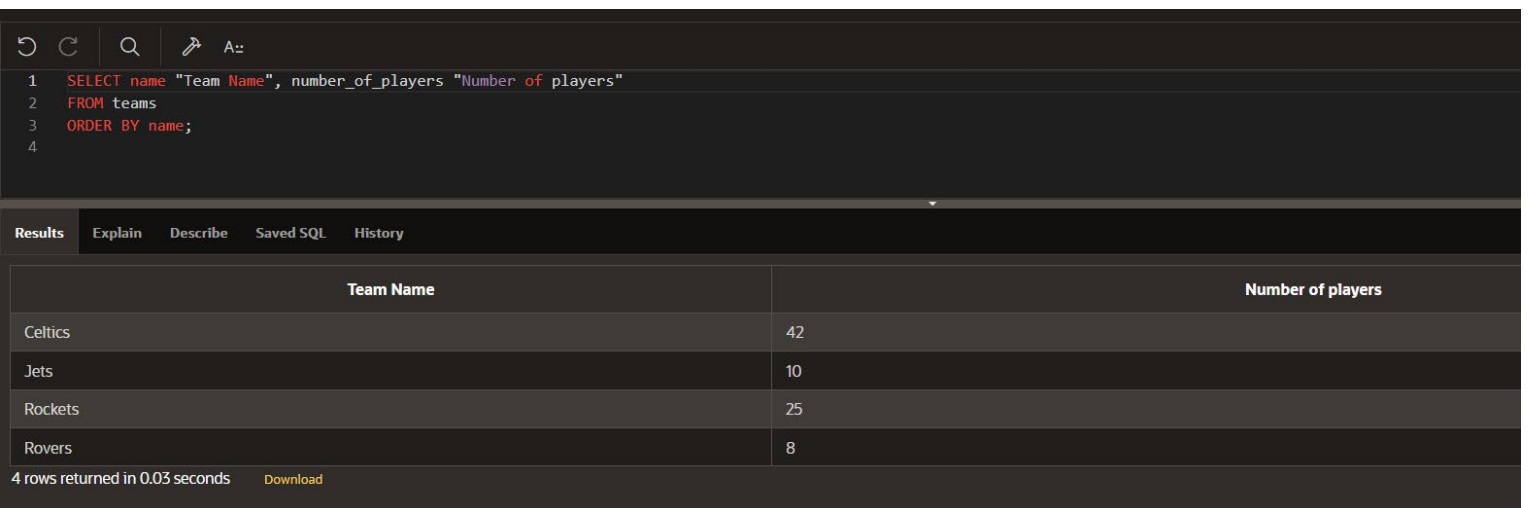
2 rows returned in 0.01 secondsDownload

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 a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a dropdown menu showing 'A:'. Below the toolbar, the SQL query is entered in a text area:

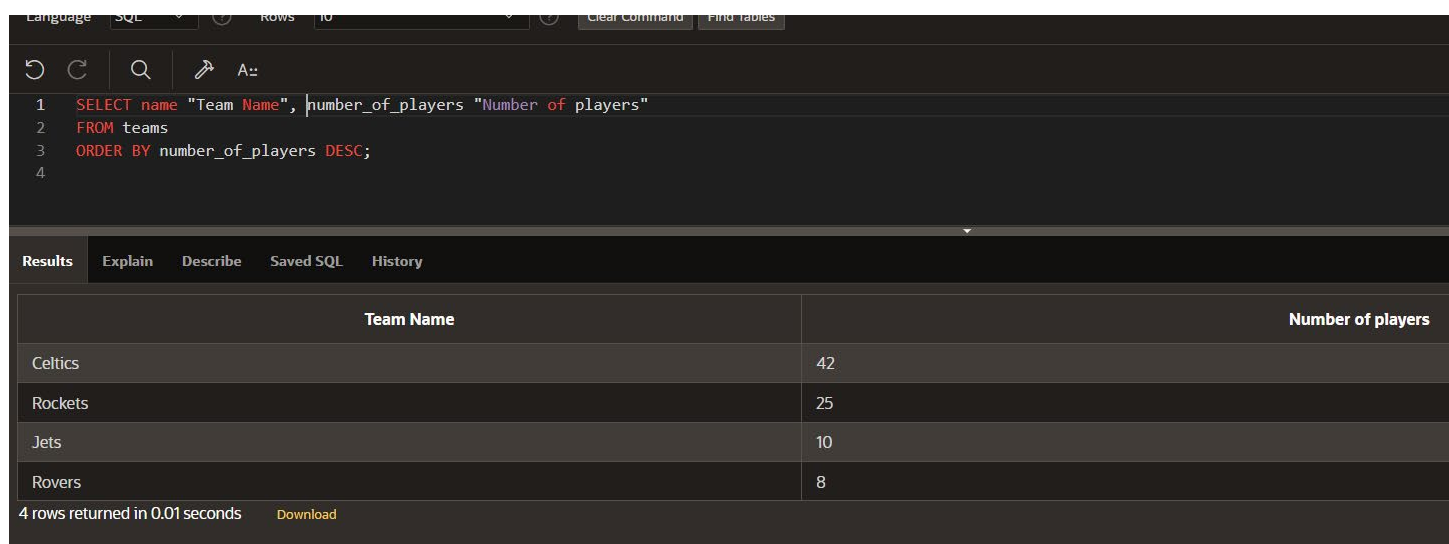
```
1 SELECT name "Team Name", number_of_players "Number of players"
2 FROM teams
3 ORDER BY name;
4
```

Below the query editor, there 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

At the bottom of the results tab, it says '4 rows returned in 0.03 seconds' and there is a 'Download' button.

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 a SQL IDE interface. At the top, there is a toolbar with icons for undo, redo, search, and a dropdown menu showing 'A:'. Below the toolbar, the SQL query is entered in a text area:

```
1 SELECT name "Team Name", number_of_players "Number of players"
2 FROM teams
3 ORDER BY number_of_players DESC;
4
```

Below the query editor, there 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

At the bottom of the results tab, it says '4 rows returned in 0.01 seconds' and there is a 'Download' button.

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.

Alphabetically in order of team name:

```
1 SELECT name,number_of_players
2 FROM teams
3 ORDER BY name;
4
```

NAME	NUMBER_OF_PLAYERS
Celtics	42
Jets	10
Rockets	25
Rovers	8

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

Descending order of name using alias:

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

Team Name	Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

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

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.

Az

1

SELECT ROWNUM AS "Customer Number",

2

first_name || ' ' || last_name AS "Customer Name"

3

FROM

4

(SELECT first_name,last_name

5

FROM customers

6

ORDER BY ctr_number)

7

WHERE ROWNUM <= 3;

8

Results

Explain

Describe

Saved SQL

History

Customer Number	Customer Name
1	Robert Thornberry
2	Jennifer Jones
3	John Doe

3 rows returned in 0.03 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.

Submit

Bind Variable	Value
:COMMISSION_RATE	5

A:

1SELECT first_name || ' ' || last_name AS "Sales Representative"

2FROM sales_representatives

3WHERE commission_rate = :commission_rate

4ORDER BY last_name;

5

Results

Explain

Describe

Saved SQL

History

Sales Representative
Barry Speed
Victoria Wright

2 rows returned in 0.03 secondsDownload