



**UTM**  
UNIVERSITI TEKNOLOGI MALAYSIA

**Sem.1 2023/2024**

**SECD 2523 Database**

**Section 08**

## **LAB 3 : DML 2 - PART 1**

**NAME : LAU YUN XI**

**MATRIC NO : A22EC0063**

**LECTURER'S NAME : DR. NOOR HIDAYAH BINTI ZAKARIA**

## 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.

1SELECT \* 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
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	987.5	sr01	t002	-
c00103	MurciaA@globaltech.com	Andrew	Murcia	07715246890	85	-	-	lc2341
c01986	margal87@delphiview.com	Maria	Galant	01442736589	125.65	sr03	t003	-
c02001	brianrog@hootech.com	Brian	Rogers	01654564898	50	-	-	lc4587

6 rows returned in 0.00 seconds

Download

2. teams.

1SELECT \* FROM teams

Results

ExplainDescribeSaved SQLHistory

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

4 rows returned in 0.00 secondsDownload

3. items

1SELECT \* FROM items

Results

ExplainDescribeSaved SQLHistory

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 baseball bat	equipment	-	-	il010230128

5 rows returned in 0.00 secondsDownload

### 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
2 FROM customers

```

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

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

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

```

1 SELECT name, number_of_players
2 FROM teams

```

NAME	NUMBER_OF_PLAYERS
Rockets	25
Celtics	42
Rovers	8
Jets	10

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

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

```

1 SELECT name, description, category
2 FROM items

```

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](#)



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**LAB 3 : DML 2 - PART 2**

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**MATRIC NO : A22EC0063**

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## Database Design Project

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

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

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.

```
1 SELECT first_name, last_name, ctr_number, current_balance, (current_balance - 5.00) AS balance_after_gift
2 FROM customers;
```

**Results** Explain Describe Saved SQL History

FIRST_NAME	LAST_NAME	CTR_NUMBER	CURRENT_BALANCE	BALANCE_AFTER_GIFT
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
Brian	Rogers	c02001	50	45

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

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

If the deduction exceeds the customer's current balance, it might result in negative balances, just like Jennifer at above.

## Part 2 : Using Column Aliases

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

[illegible]

## Part 3: Using Literal Character Strings

1. Write a query that will display the team information in the following format:

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

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

```
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

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 Rovers team has 8 players and receives a discount of percent.

The Jets team has 10 players and receives a discount of 5 percent.

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

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

The Rovers team doesn't show a discount because the discount column for the Rovers team in the teams table has a NULL value. In SQL, a NULL value represents the absence of value or an undefined value.







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**LAB 3 : DML 2 - PART 3**

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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.

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

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 0.01 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.

```
1 SELECT first_name, last_name, ctr_number
2 FROM customers
3 WHERE current_balance > 100;
```

FIRST_NAME	LAST_NAME	CTR_NUMBER
Robert	Thornberry	c00001
John	Doe	c00101
Maria	Galant	c01986

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

3. 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.

```
1 SELECT id, odr_date, odr_time
2 FROM orders
3 WHERE odr_date < TO_DATE('28-May-2019', 'DD-Mon-YYYY');
```

ID	ODR_DATE	ODR_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 0.02 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.

```
1 SELECT id, cost, units
2 FROM inventory_list
3 WHERE cost BETWEEN 3.00 AND 15.00;
```

ID	COST	UNITS
il010230125	7.99	250
il010230126	5.24	87

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

### 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.

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

Results	Explain	Describe	Saved SQL	History
Inventory ID				
Trade Cost				
Number of Units				
il010230124				
2.5				
100				
1 rows returned in 0.01 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
2   id AS "Inventory ID",
3   cost AS "Trade Cost",
4   units AS "Number of Units"
5 FROM inventory_list
6 WHERE units NOT IN (50, 100, 150, 200);
```

Results	Explain	Describe	Saved SQL	History
Inventory ID				
Trade 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.

```
1 SELECT itm_number, name
2 FROM items
3 WHERE UPPER(name) LIKE 'G%';
```

Results	Explain	Describe	Saved SQL	History
ITM_NUMBER				
NAME				
im01101044				
gloves				
im01101047				
game top				
2 rows returned in 0.01 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

2

itm\_number AS "Item Number",

3

name AS "Item Name"

4

FROM items

5

WHERE LOWER(name) LIKE '%o%';

Results

Explain

Describe

Saved SQL

History

Item Number	Item Name
im01101044	gloves
im01101046	socks
im01101047	game top

3 rows returned in 0.01 seconds

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## **LAB 3 : DML 2 - PART 4**

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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.

```
1 SELECT 'The '||NAME||' team has '||NUMBER_OF_PLAYERS||' players and does not receive a
2 discount.' AS "TEAM INFORMATION"
3 FROM TEAMS
4 WHERE DISCOUNT IS NULL;
```

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.

```
1 SELECT 'The '||NAME||' team has '||NUMBER_OF_PLAYERS||' players and receives a discount of
2 '||DISCOUNT||' percent.' AS "TEAM INFORMATION"
3 FROM TEAMS
4 WHERE DISCOUNT IS NOT NULL;
```

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 0.01 seconds [Download](#)

## 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 AS "CUSTOMER NUMBER",ADDRESS_LINE_1 AS "STREET ADDRESS",ZIP_CODE
2 AS "POSTAL CODE"
3 FROM CUSTOMERS_ADDRESSES
4 WHERE CITY='Liverpool' AND ADDRESS_LINE_2='Starford';
```

CUSTOMER NUMBER	STREET ADDRESS	POSTAL CODE
c00001	17 Gartsquare Road	LP89JHK

1 rows returned in 0.02 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.

```
1 SELECT CTR_NUMBER AS "CUSTOMER NUMBER",ADDRESS_LINE_1 AS "STREET ADDRESS",ZIP_CODE
2 AS "POSTAL CODE"
3 FROM CUSTOMERS_ADDRESSES
4 WHERE CITY='Liverpool' OR ADDRESS_LINE_2='Starford';
```

CUSTOMER NUMBER	STREET ADDRESS	POSTAL CODE
c00001	17 Gartsquare Road	LP89JHK
c00001	63 Acacia Drive	LP83JHR

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

## Part 4: Logical Operators: NOT Equal To

- 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.

```
1 SELECT CTR_NUMBER AS "CUSTOMER NUMBER",ADDRESS_LINE_1 AS "STREET ADDRESS",ZIP_CODE
2 AS "POSTAL CODE"
3 FROM CUSTOMERS_ADDRESSES
4 WHERE CITY NOT IN ('Liverpool');
```

CUSTOMER NUMBER	STREET ADDRESS	POSTAL CODE
c00101	54 Ropehill Crescent	ST45AGV
c01986	36 Watercress Lane	JP23YTH

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



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## **LAB 3 : DML 2 - PART 5**

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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.

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

Results Explain Describe Saved SQL History

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

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

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

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

Results Explain Describe Saved SQL History

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

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

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

Results Explain Describe Saved SQL History

Team Name	Players
Rovers	8
Rockets	25
Jets	10
Celtics	42

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



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## **LAB 3 : DML 2 - PART 6**

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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.

```

1 SELECT
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;

```

**Results** Explain Describe Saved SQL History

Customer Name
Robert Thornberry
Jennifer Jones
John Doe

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.

```

1 SELECT
2     first_name AS "First Name",
3     last_name AS "Last Name",
4     commission_rate AS "Commission Rate"
5 FROM sales_representatives
6 WHERE commission_rate = :CommissionRate
7 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 0.02 seconds [Download](#)

Bind Variable	Value
:COMMISSIONRATE	<input type="text" value="5"/>