UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SECD2523-10 DATABASE

SEMESTER 1

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LAB 3 – DML2

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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. customers.
   SELECT* FROM customers;

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	–	–	Ic4587

2. teams.
   SELECT* FROM teams;

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;

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

Part 2: Selecting Specific Columns

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

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

CTR_NUMBER	EMAIL	FIRST_NAME	PHONE_NUMBER
c00001	bob.thornberry@heatmail.com	Robert	01234567898
c00012	Jjones@freemail.com	Jennifer	01505214598
c00101	unknown@here.com	John	03216547808
c00103	MurciaA@globaltech.com	Andrew	07715246890
c01986	margal87@delphiview.com	Maria	01442736589
c02001	brianrog@hootech.com	Brian	01654564898

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

```
318 SELECT name,number_of_players FROM teams;
```

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.

```
317  SELECT name,description,category 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 quaity basball bat	equipment

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.

```
319  SELECT first_name,last_name,current_balance,current_balance/12 AS monthly_payment
320  FROM customers;
```

FIRST_NAME	LAST_NAME	CURRENT_BALANCE	MONTHLY_PAYMENT
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.291666666666666666666666666666666666667
Andrew	Murcia	85	7.083333333333333333333333333333333333333
Maria	Galant	125.65	10.470833333333333333333333333333333333333
Brian	Rogers	50	4.166666666666666666666666666666666666667

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.

```
322 SELECT first_name,last_name,current_balance,current_balance-5.00 AS adjusted_balance
323 FROM customers;
```

FIRST_NAME	LAST_NAME	CURRENT_BALANCE	ADJUSTED_BALANCE
Robert	Thornberry	150	145
Jennifer	Jones	0	-5
John	Doe	987.5	982.5
Andrew	Murcia	85	80
Maria	Galant	125.65	120.65
Brian	Rogers	50	45

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

   The current balance value cannot below zero.

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).

```
325 SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance", current_balance/12 AS "Monthly Repayments" FROM customers;
```

First Name	Last Name	Balance	Monthly Repayments
Robert	Thornberry	150	12.5
Jennifer	Jones	0	0
John	Doe	987.5	82.291666666666666666666666666666666666667
Andrew	Murcia	85	7.083333333333333333333333333333333333333
Maria	Galant	125.65	10.470833333333333333333333333333333333333
Brian	Rogers	50	4.166666666666666666666666666666666666667

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;
```

6 rows selected.

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.

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

   It contains a null value that is not equal to zero.

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.

```
SELECT *
FROM customers
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	–

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.

```
SELECT first_name AS "First Name", last_name AS "Last Name", current_balance AS "Balance"
FROM customers
WHERE current_balance >100;
```

First Name	Last Name	Balance
Robert	Thornberry	150
John	Doe	987.5
Maria	Galant	125.65

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.

```
338
339 SELECT id AS "Order ID", odr_date AS "Order Date", TO_CHAR (odr_time, 'HH24:MI:SS') AS "Order Time"
340 FROM orders
341 WHERE odr_date < '28-May-2017';
```

3 rows selected.

Order ID	Order Date	Order Time
or0101250	17-APR-17	08:32:30
or0101350	24-MAY-17	10:30:35

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.

```
343 SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units in Stock"
344 FROM inventory_list
345 WHERE cost BETWEEN 3 AND 15;
346
```

Inventory ID	Cost	Number of Units in Stock
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.

```
347 SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units in Stock"
348 FROM inventory_list
349 WHERE units IN (50, 100, 150, 200, 250);
350
```

2 rows selected.

Inventory ID	Cost	Number of Units in Stock
il010230124	2.5	100
il010230125	7.99	250

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.

```
SELECT id AS "Inventory ID", cost AS "Cost", units AS "Number of Units in Stock"
FROM inventory_list
WHERE units NOT IN (50, 100, 150, 200, 250);
```

Inventory ID	Cost	Number of Units in Stock
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.

```
SELECT itm_number AS "Item ID", name AS "Item Name"
FROM items
WHERE name LIKE 'g%';
```

Item ID	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.

```
SELECT itm_number AS "Item ID", name AS "Item Name"
FROM items
WHERE name LIKE '%o%';
```

Item ID	Item Name
im01101044	gloves
im01101046	socks
im01101047	game top

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.

```
363 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and does not receive a discount ' AS "Team Information"
364 FROM teams
365 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.

```
367 SELECT 'The ' || name || ' team has ' || number_of_players || ' players and receives a discount of ' || discount || ' percent.' AS "Team Information"
368 FROM teams
369 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.

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.

```
371 SELECT ctr_number AS "Customer Number", Address_line_1 AS "Street Address", zip_code AS"Postal Code"
372 FROM customers_addresses
373 WHERE city = 'Liverpool' AND address_line_2 = 'Starford';
```

3 rows selected.

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.

```
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';
```

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

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');
```

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.

```
SELECT name AS "Team Name", number_of_players AS "Number of Players"
FROM teams
ORDER BY 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.

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

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.

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

Team Name	Number of 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.

```
SELECT ROWNUM As "Order of Membership", first_name || ' ' ||last_name AS "Customer Name"
FROM(SELECT first_name, last_name
FROM customers
ORDER BY ctr_number)
WHERE ROWNUM <=3;

```

4 rows selected.

Order of Membership	Customer Name
1	Robert Thornberry
2	Jennifer Jones
3	John Doe

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.

```
401 SELECT first_name AS "First Name ",last_name AS "Last Name",commission_rate AS " Commission Rate"
402 FROM sales_representatives
403 WHERE commission_rate = 5
404 ORDER BY last_name;
```

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