

## Lab 3: SQL 3 – Data Manipulation Language 2

### SECD2523 - Database

#### Universiti Teknologi Malaysia

#### Objective:

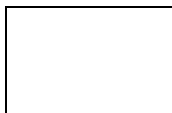
1. To retrieve data that is stored in the database system by using a SELECT method
2. To refine the data that is returned to query by adding a WHERE clause to the SELECT statement.
3. To sort the order of the data that is returned to the query by adding an ORDER BY clause to the end of the SELECT statement.

**Reference material:** Computer Networking: A Top-Down Approach, 7th ed., J.F. Kurose and K.W. Ross.

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## **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 table

1. customers.
2. teams.
3. Items.

Part 1
1. SELECT * FROM CUSTOMERS ;
2. SELECT * FROM TEAMS ;
3. SELECT * FROM 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 2
1. SELECT CTR-NUMBER, FIRST-NAME, LAST-NAME, EMAIL, PHONE-NUMBER FROM CUSTOMERS ;
2. SELECT NAME, NUMBER-OF-PLAYERS FROM TEAMS ;
3. SELECT NAME, DESCRIPTION, CATEGORY FROM ITEMS ;

## 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.
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?

Exercise 2
Part 1
1. SELECT FIRST-NAME, LAST-NAME, CURRENT-BALANCE, <del>CURRENT</del> CURRENT-BALANCE / 12 AS MONTHLY-PAYMENT ; FROM CUSTOMERS ;
2. SELECT FIRST-NAME, LAST-NAME, CTR-NUMBER, CURRENT-BALANCE, CURRENT-BALANCE - 5.00 AS NEW-BALANCE FROM CUSTOMERS ;
3. There will be negative value especially with current balance that valued less than 5.00. The query does not consider for cases in which subtracting the gift card value might leads to a negative balances.

## 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 2
1. SELECT FIRST_NAME "First Name", LAST_NAME "Last Name", CURRENT_BALANCE "Balance", CURRENT_BALANCE / 12 "Monthly Repayment" FROM CUSTOMERS ;

## Part 3: Using Literal Character Strings

1. Write a query that will display the team information in the following format:
  - a. 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 3
1. SELECT 'The '    NAME    " team has " NUMBER_OF_PLAYERS    " players and receives a discount of '    DISCOUNT    " percent%." AS "Team Information" FROM TEAMS ;
2. The Rovers team does not show a discount because the DISCOUNT attribute is nullable, which, in this case, their discount value is NULL

## EXERCISE 3: 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.
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.

Exercise 3
Part 1
1. SELECT CTR-NUMBER, EMAIL, FIRST-NAME, LAST-NAME, PHONE-NUMBER, CURRENT-BALANCE, SRE-ID, TEM-ID, LOYALTY-CARD-NUMBER FROM CUSTOMERS WHERE CTR-NUMBER = 'C01986';
2. SELECT FIRST-NAME "First Name", LAST-NAME "Last Name", CTR-NUMBER "Customer Number" FROM CUSTOMERS WHERE CURRENT-BALANCE > 100;
3. SELECT ID "order ID", ODR-DATE "order date", ODR-TIME "order time" FROM ORDERS WHERE ODR-DATE < '28-May-2019';

## **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 2
1. SELECT ID " <del>Item</del> Item ID", COST "Cost", UNITS "Number of Units" FROM "INVENTORY_LIST" WHERE COST 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 3
1. SELECT ID "Item ID", COST "Cost", UNITS "Numbers of Units" FROM INVENTORY_LIST WHERE UNITS IN (50, 100, 150, 200) ;



#### **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 4
1. SELECT ID "Item ID", COST "Cost", UNITS "Number of Units"
FROM INVENTORY_LIST
WHERE UNITS NOT IN (50, 100, 150, 200);

#### **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 5
1. SELECT ITM_NUMBER "Item Number", NAME "Name"
FROM ITEMS
WHERE NAME LIKE 'g%';



### **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 6
1. SELECT ITM_NUMBER "Item Number", NAME "Name"
FROM ITEMS
WHERE NAME LIKE '%o%';

## EXERCISE 4: 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:

- a. 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:

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

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

Exercise 4
Part 1
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. SELECT 'The '    NAME    ' team has '    NUMBER_OF_PLAYERS    ' players and receive a discount of '    DISCOUNT    ' percent.'
AS "Team Information"
FROM TEAMS
WHERE DISCOUNT IS NOT NULL;

## **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 2
1. SELECT CTR_NUMBER "Customer Number", ADDRESS_LINE_1 "Street Address", ZIP_CODE "Postal Code",
FROM CUSTOMERS_ADDRESSES
WHERE ADDRESS_LINE_2 = 'Starford'
AND CITY = 'Liverpool' ;

## **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 3
1. SELECT CTR_NUMBER "Customer Number", ADDRESS_LINE_1 "Street Address", ZIP_CODE "Postal Code"
FROM CUSTOMERS_ADDRESSES
WHERE ADDRESS_LINE_2 = 'Starford'
OR CITY = 'Liverpool' ;

#### **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 4

```
1. SELECT CTR_NUMBER "Customer Number", ADDRESS_LINE_1 "Street Address",  
        ZIP_CODE "Postal Code"  
FROM CUSTOMERS-ADDRESSES  
WHERE CITY NOT IN ('Liverpool')
```

## **EXERCISE 5: Sorting Data Using ORDER BY**

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

Exercise 5
1. SELECT NAME "Team Name", NUMBER_OF_PLAYERS "Number of <del>Pl</del> Players" FROM TEAMS ORDER BY NAME ASC ;
2. SELECT NAME "Team Name", NUMBER_OF_ <del>Playe</del> PLAYERS "Number of Players" FROM TEAMS ORDER BY NUMBER_OF_ <del>PLA</del> PLAYERS DESC ;
3. SELECT NAME "Team Name", NUMBER_OF_PLAYERS "Number of Players" FROM TEAMS ORDER BY "Team Name" DESC ;

## **EXERCISE 6: Sorting Data Using ORDER BY**

### **Part 1 : TOP-N-ANALYSIS**

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.

Exercise 6
Part 1
1. SELECT ROWNUM AS "Customer Number", FIRST_NAME    ' '    LAST_NAME AS "Customer Name" FROM ( SELECT CTR_NUMBER, FIRST_NAME, LAST_NAME FROM CUSTOMERS ORDER BY CTR_NUMBER ) WHERE ROWNUM <= 3 ;

### **Part 2 : Using a Substitution Variable**

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 2
1. SELECT FIRST_NAME "First Name", LAST_NAME "Last Name", COMMISSION_RATE "Commission Rate" FROM SALES_REPRESENTATIVES WHERE COMMISSION_RATE = (SELECT value FROM commission_config WHERE key = 'default-rate') ORDER BY LAST_NAME ;