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UTM Johor Bahru

## **SECD2523 - DATABASE**

**SECTION: 08**

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**LAB 3- DML2**

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**A22EC0149**

## 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

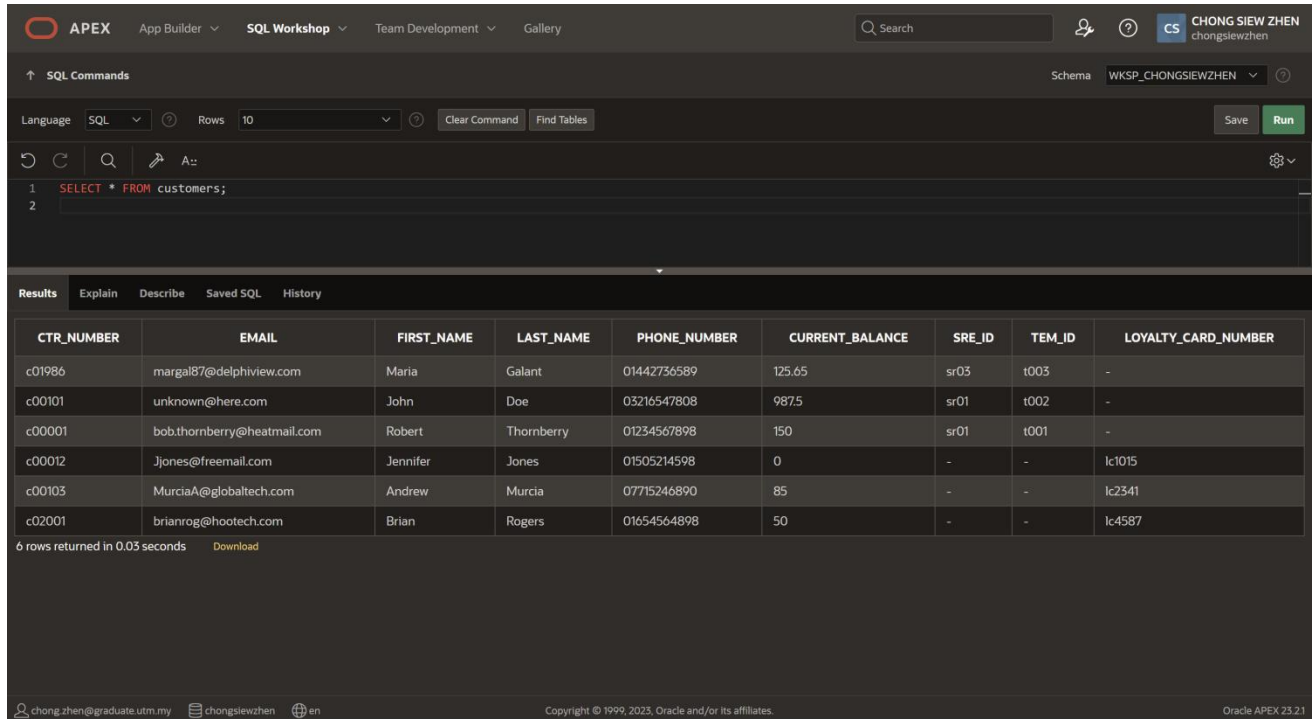
### Write and Execute SELECT statements (S6L6 Objective 2)

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:

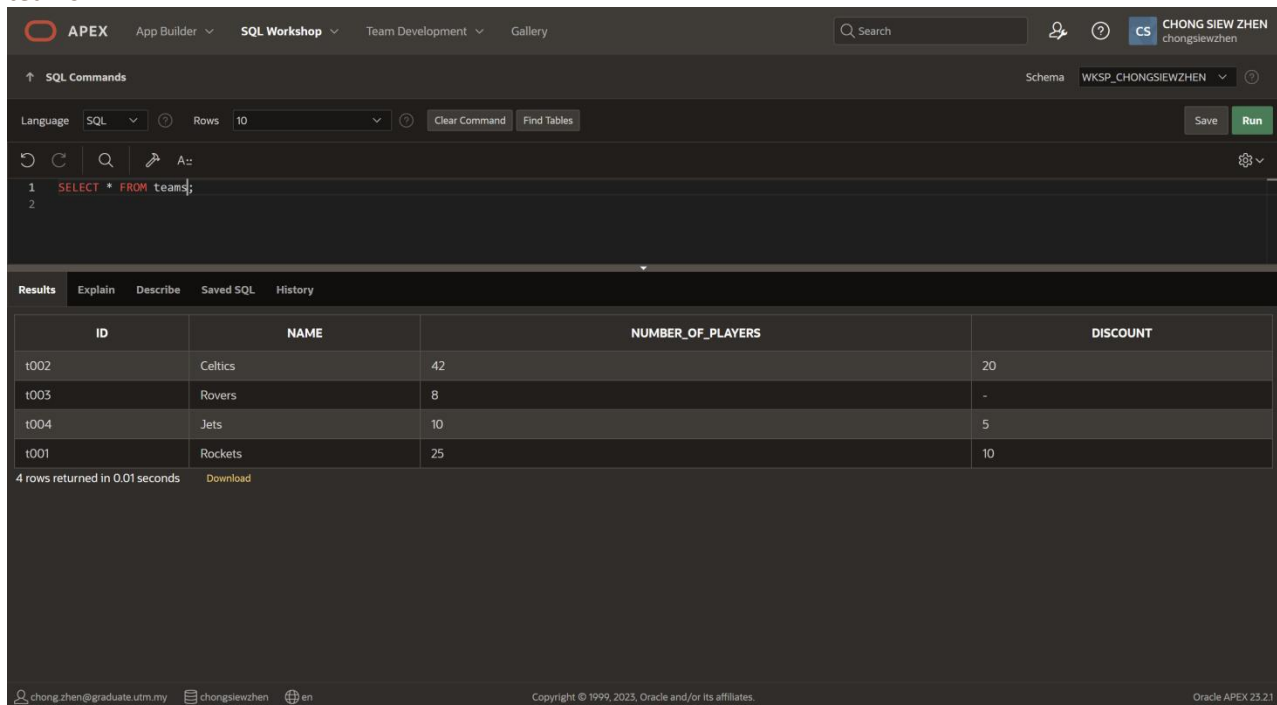
##### 1. customers.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is `SELECT * FROM customers;`. The results are displayed in a table with the following columns: CTR\_NUMBER, EMAIL, FIRST\_NAME, LAST\_NAME, PHONE\_NUMBER, CURRENT\_BALANCE, SRE\_ID, TEM\_ID, and LOYALTY\_CARD\_NUMBER. There are 6 rows of data returned.

| 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   | -                   |
| c00101     | unknown@here.com            | John       | Doe        | 03216547808  | 987.5           | sr01   | t002   | -                   |
| c00001     | bob.thornberry@heatmail.com | Robert     | Thornberry | 01234567898  | 150             | sr01   | t001   | -                   |
| c00012     | Jjones@freemail.com         | Jennifer   | Jones      | 01505214598  | 0               | -      | -      | lc1015              |
| c00103     | MurciaA@globaltech.com      | Andrew     | Murcia     | 07715246890  | 85              | -      | -      | lc2341              |
| c02001     | brianrog@hootech.com        | Brian      | Rogers     | 01654564898  | 50              | -      | -      | lc4587              |

##### 2. teams.



The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command entered is `SELECT * FROM teams;`. The results are displayed in a table with the following columns: ID, NAME, NUMBER\_OF\_PLAYERS, and DISCOUNT. There are 4 rows of data returned.

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

3. items

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

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↑ SQL Commands

SchemaWKSP\_CHONGSIEWZHEN

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

1

2

SELECT \* FROM items;

Results

Explain

Describe

Saved SQL

History

| ITM_NUMBER | NAME        | DESCRIPTION                 | CATEGORY  | COLOR | Size | ILT_ID      |
|------------|-------------|-----------------------------|-----------|-------|------|-------------|
| 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 quatty basball bat     | equipment | -     | -    | il010230128 |
| im01101044 | gloves      | catcher mitt                | clothing  | brown | m    | il010230124 |
| im01101045 | under shirt | top worn under the game top | clothing  | white | s    | il010230125 |

5 rows returned in 0.03 seconds

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Part 2: Selecting Specific Columns

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

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CS

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SQL Commands

SchemaWKSP\_CHONGSIEWZHEN

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

1SELECT ctr\_number, first\_name, last\_name, email, phone\_number

2FROM customers;

Results

Explain

Describe

Saved SQL

History

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

6 rows returned in 0.01 secondsDownload

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

APEX

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Team Development

Gallery

Search

CS

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SQL Commands

SchemaWKSP\_CHONGSIEWZHEN

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

1SELECT name, number\_of\_players

2FROM teams;

Results

Explain

Describe

Saved SQL

History

| NAME    | NUMBER_OF_PLAYERS |
|---------|-------------------|
| Celtics | 42                |
| Rovers  | 8                 |
| Jets    | 10                |
| Rockets | 25                |

4 rows returned in 0.00 secondsDownload

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

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Search

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SQL Commands

SchemaWKSP\_CHONGSIEWZHEN

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

A:

1SELECT name, description, category

2FROM items;

Results

Explain

Describe

Saved SQL

History

| NAME        | DESCRIPTION                 | CATEGORY  |
|-------------|-----------------------------|-----------|
| socks       | team socks with emblem      | clothing  |
| game top    | team shirt with emblem      | clothing  |
| premium bat | high quaity basball bat     | equipment |
| gloves      | catcher mitt                | clothing  |
| under shirt | top worn under the game top | clothing  |

5 rows returned in 0.00 secondsDownload

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Oracle APEX 23.2.1

## 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.

The screenshot displays the Oracle APEX SQL Workshop interface. At the top, the navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'CHONG SIEW ZHEN' are also visible. The 'SQL Commands' tab is active, showing a query with two lines: `1 SELECT first_name, last_name, current_balance, ROUND(current_balance/12,2) as monthly_payment` and `2 FROM customers;`. Below the command area, the 'Results' tab shows a table with four columns: 'FIRST\_NAME', 'LAST\_NAME', 'CURRENT\_BALANCE', and 'MONTHLY\_PAYMENT'. The table contains six rows of data. Below the table, it states '6 rows returned in 0.01 seconds' with a 'Download' link. The footer includes the user email 'chong.zhen@graduate.utm.my', the username 'chongsiewzhen', and the Oracle APEX version '23.2.1'.

| FIRST_NAME | LAST_NAME  | CURRENT_BALANCE | MONTHLY_PAYMENT |
|------------|------------|-----------------|-----------------|
| Maria      | Galant     | 125.65          | 10.47           |
| John       | Doe        | 987.5           | 82.29           |
| Robert     | Thornberry | 150             | 12.5            |
| Jennifer   | Jones      | 0               | 0               |
| Andrew     | Murcia     | 85              | 7.08            |
| Brian      | Rogers     | 50              | 4.17            |

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.

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

CS

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SQL Commands

SchemaWKSP\_CHONGSIEWZHEN

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

SQL Editor

1SELECT first\_name, last\_name, ctr\_number, current\_balance, current\_balance-5.00 as balance\_after\_gift

2FROM customers;

Results

Explain

Describe

Saved SQL

History

| FIRST_NAME | LAST_NAME  | CTR_NUMBER | CURRENT_BALANCE | BALANCE_AFTER_GIFT |
|------------|------------|------------|-----------------|--------------------|
| Maria      | Galant     | c01986     | 125.65          | 120.65             |
| John       | Doe        | c00101     | 987.5           | 982.5              |
| Robert     | Thornberry | c00001     | 150             | 145                |
| Jennifer   | Jones      | c00012     | 0               | -5                 |
| Andrew     | Murcia     | c00103     | 85              | 80                 |
| Brian      | Rogers     | c02001     | 50              | 45                 |

6 rows returned in 0.01 seconds

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Oracle APEX 23.2.1

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

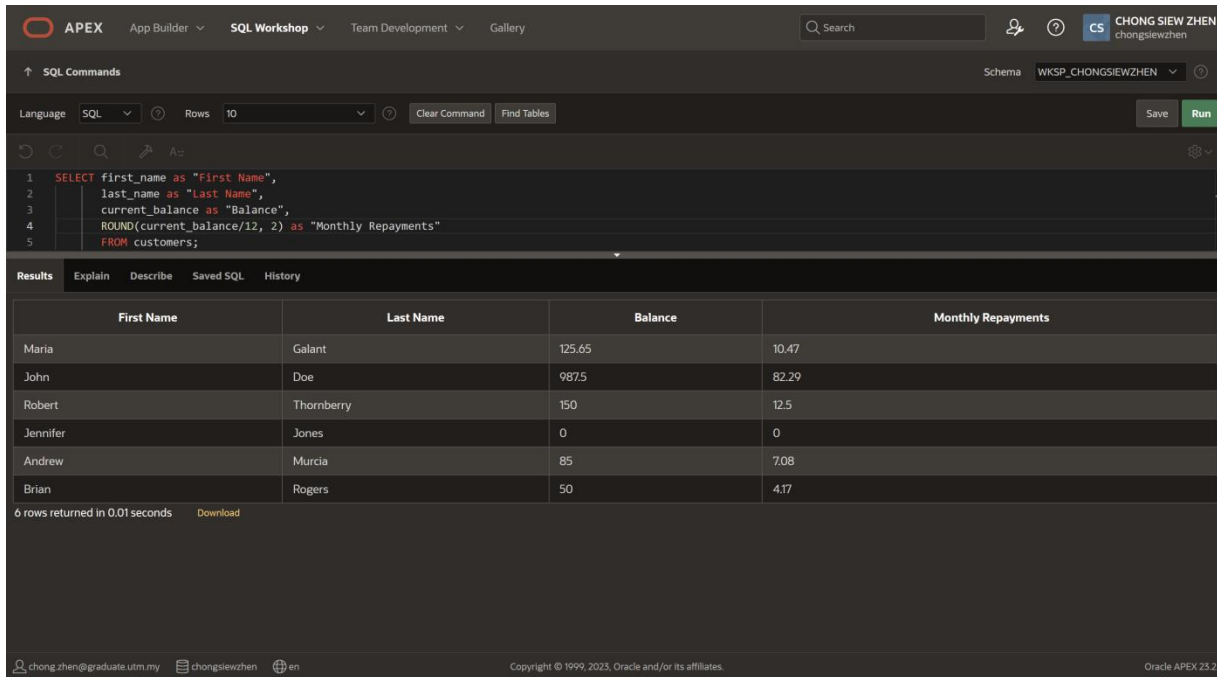
Suppose the current balance cannot be a negative value. But, the value for Jennifer is -5 after minusing the gift.

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## 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).



The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The user is logged in as 'CHONG SIEW ZHEN' with the email 'chongsiewzhen'. The 'SQL Commands' panel shows a query with column aliases. The 'Results' panel displays a table with 6 rows and 4 columns: 'First Name', 'Last Name', 'Balance', and 'Monthly Repayments'. The query is as follows:

```
1 SELECT first_name as "First Name",
2        last_name as "Last Name",
3        current_balance as "Balance",
4        ROUND(current_balance/12, 2) as "Monthly Repayments"
5 FROM customers;
```

The results table contains the following data:

| First Name | Last Name  | Balance | Monthly Repayments |
|------------|------------|---------|--------------------|
| Maria      | Galant     | 125.65  | 10.47              |
| John       | Doe        | 9875    | 82.29              |
| Robert     | Thornberry | 150     | 12.5               |
| Jennifer   | Jones      | 0       | 0                  |
| Andrew     | Murcia     | 85      | 7.08               |
| Brian      | Rogers     | 50      | 4.17               |

6 rows returned in 0.01 seconds. A 'Download' link is available below the results.

### 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.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command window contains the following query:

```
1 SELECT
2   'The ' || name || ' team has ' || number_of_players || ' players and receives a discount of ' || discount || ' percent.' as "Team Information"
3 FROM teams;
4
```

The Results tab shows the output of the query:

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

4 rows returned in 0.00 seconds

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

The discount value of Rovers is null, null does not mean 0.

## 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.

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

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL Commands pane contains the following query:

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

The Results pane shows the query results in a table with 9 columns: CTR\_NUMBER, EMAIL, FIRST\_NAME, LAST\_NAME, PHONE\_NUMBER, CURRENT\_BALANCE, SRE\_ID, TEM\_ID, and LOYALTY\_CARD\_NUMBER. The results show one row for Maria Galant with customer 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 0.00 seconds

- 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.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL Commands pane contains the following query:

```
1 SELECT
2 first_name as "First Name",
3 last_name as "Last Name",
4 ctr_number as "Customer Number"
5 FROM customers
6 WHERE current_balance>100;
```

The Results pane shows the query results in a table with 3 columns: First Name, Last Name, and Customer Number. The results show three rows: Maria Galant, John Doe, and Robert Thornberry.

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

3 rows returned in 0.01 seconds

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.

The screenshot shows the Oracle APEX SQL Workshop interface. At the top, there's a navigation bar with 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'CHONG SIEW ZHEN' are also present. Below this, the 'SQL Commands' section shows a query editor with the following SQL code:

```
1 SELECT
2   id as "Order ID",
3   odr_date as "Ordered Date",
4   odr_time as "Ordered Time"
5 FROM orders
6 WHERE odr_date < TO_DATE('28-MAY-2019', 'DD-MON-YYYY');
7
```

The 'Results' tab is active, displaying a table with 5 rows. The columns are 'Order ID', 'Ordered Date', and 'Ordered Time'. The data is as follows:

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

Below the table, it states '5 rows returned in 0.01 seconds' and provides a 'Download' link. The footer contains the user's email 'chong.zhen@graduate.utm.my', the username 'chongsiewzhen', the language 'en', the copyright notice 'Copyright © 1999, 2023, Oracle and/or its affiliates.', and the version 'Oracle APEX 23.21'.

## 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command is as follows:

```
1 SELECT
2   id as "Inventory ID",
3   cost as "Cost",
4   units as "Number of Units"
5 FROM inventory_list
6 WHERE cost BETWEEN 3.00 AND 15.00;
7
```

The results are displayed in a table with the following data:

| Inventory ID | Cost | Number of Units |
|--------------|------|-----------------|
| ii010230126  | 5.24 | 87              |
| ii010230125  | 7.99 | 250             |

2 rows returned in 0.03 seconds

## 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command is as follows:

```
1 SELECT
2   id as "Inventory ID",
3   cost as "Cost",
4   units as "Number of Units"
5 FROM inventory_list
6 WHERE units IN(50, 100, 150, 200);
7
```

The results are displayed in a table with the following data:

| Inventory ID | Cost | Number of Units |
|--------------|------|-----------------|
| ii010230124  | 2.5  | 100             |

1 rows returned in 0.01 seconds

## 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

```
1 SELECT
2   id as "Inventory ID",
3   cost as "Cost",
4   units as "Number of Units"
5 FROM inventory_list
6 WHERE units NOT IN(50, 100, 150, 200);
7
```

The Results tab displays the following data:

| Inventory ID | Cost  | Number of Units |
|--------------|-------|-----------------|
| ii010230126  | 5.24  | 87              |
| ii010230127  | 18.95 | 65              |
| ii010230128  | 97.46 | 8               |
| ii010230125  | 7.99  | 250             |

4 rows returned in 0.01 seconds

## 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

```
1 SELECT
2   itm_number as "Item Number",
3   name as "Item name"
4 FROM items
5 WHERE name like 'g%';
6
```

The Results tab displays the following data:

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

2 rows returned in 0.00 seconds

## 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.

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. The user is logged in as 'CHONG SIEW ZHEN' with the schema 'WKSP\_CHONGSIEWZHEN'. The 'SQL Commands' tab is active, showing a SQL query:

```
1 SELECT
2   itm_number as "Item Number",
3   name as "Item name"
4 FROM items
5 WHERE name like '%o%';
6
```

The 'Results' tab is active, displaying a table with two columns: 'Item Number' and 'Item name'. The table contains three rows of data:

| Item Number | Item name |
|-------------|-----------|
| im01101046  | socks     |
| im01101047  | game top  |
| im01101044  | gloves    |

Below the table, it states '3 rows returned in 0.03 seconds' with a 'Download' link. The footer includes the user's email 'chong.zhen@graduate.utm.my', the username 'chongsiewzhen', the language 'en', the copyright notice 'Copyright © 1999, 2023, Oracle and/or its affiliates.', and the version 'Oracle APEX 23.2.1'.

## 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

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

The Results tab shows the output of the query:

| 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

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

The Results tab shows the output of the query:

| Team Information  |
|---|
| The Celtics team has 42 players and receive a discount of 20 percent. |
| The Jets team has 10 players and receive a discount of 5 percent.     |
| The Rockets team has 25 players and receive a discount of 10 percent. |

3 rows returned in 0.01 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

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

The Results tab shows the following data:

| Customer Number | Street Address     | Postal Code |
|-----------------|--------------------|-------------|
| c00001          | 17 Gartsquare Road | LP89JHK     |

1 rows returned in 0.03 seconds

## 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.

The screenshot shows the APEX SQL Workshop interface. The SQL command area contains the following query:

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

The Results tab shows the following data:

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

2 rows returned in 0.01 seconds

## 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.

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'CHONG SIEW ZHEN' are on the right. The 'SQL Commands' section shows the selected schema 'WKSP\_CHONGSIEWZHEN'. Below this, the 'Language' is set to 'SQL' and 'Rows' to '10'. The SQL command area contains the following query:

```
1 SELECT
2   ctr_number as "Customer Number",
3   address_line_1 as "Street Address",
4   zip_code as "Postal Code"
5 FROM customers_addresses
6 WHERE city NOT IN('Liverpool');
```

The 'Results' tab is active, displaying a table with 2 rows. The table has three columns: 'Customer Number', 'Street Address', and 'Postal Code'.

| Customer Number | Street Address       | Postal Code |
|-----------------|----------------------|-------------|
| c00101          | 54 Ropehill Crescent | ST45AGV     |
| c01986          | 36 Watercress Lane   | JP23YTH     |

Below the table, it states '2 rows returned in 0.00 seconds' with a 'Download' link. The footer includes the user's email 'chong.zhen@graduate.utm.my', the username 'chongsiewzhen', the language 'en', the copyright notice 'Copyright © 1999, 2023, Oracle and/or its affiliates.', and the version 'Oracle APEX 23.21'.

## 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 the Oracle APEX SQL Workshop interface. The SQL command entered is:

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

The results are displayed in a table with the following data:

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

4 rows returned in 0.01 seconds

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 the Oracle APEX SQL Workshop interface. The SQL command entered is:

```
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;
```

The results are displayed in a table with the following data:

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

4 rows returned in 0.00 seconds

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.

The screenshot shows the APEX SQL Workshop interface. At the top, there's a navigation bar with 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'CHONG SIEW ZHEN' are also present. Below this, the 'SQL Commands' section shows a query editor with the following SQL code:

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

The 'Results' tab is active, displaying a table with two columns: 'Team Name' and 'Players'. The table contains four rows of data, sorted by 'Team Name' in descending order.

| Team Name | Players |
|-----------|---------|
| Rovers    | 8       |
| Rockets   | 25      |
| Jets      | 10      |
| Celtics   | 42      |

Below the table, it states '4 rows returned in 0.01 seconds' with a 'Download' link. The footer includes the user's email 'chong.zhen@graduate.utm.my', the username 'chongsiewzhen', the language 'en', the copyright notice 'Copyright © 1999, 2023, Oracle and/or its affiliates.', and the version 'Oracle APEX 23.2.1'.

## 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.

The screenshot shows the Oracle APEX SQL Workshop interface. The SQL command area contains the following query:

```
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   )
8 WHERE ROWNUM <= 3;
```

The Results tab shows the output of the query:

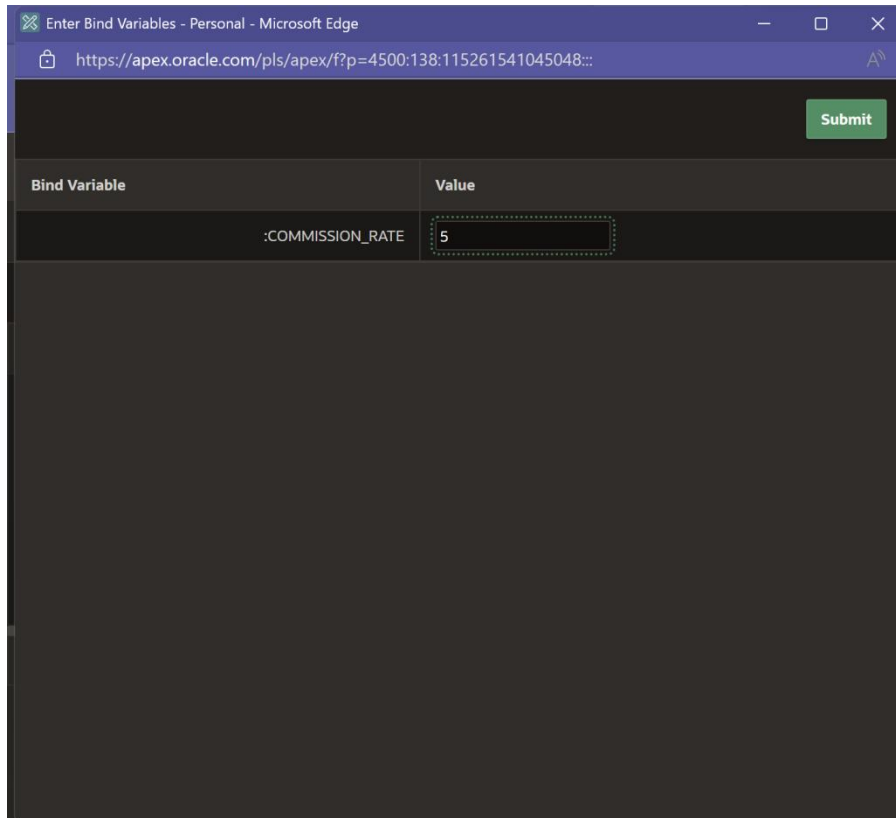
| Customer Name     |
|-------------------|
| Robert Thornberry |
| Jennifer Jones    |
| John Doe          |

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

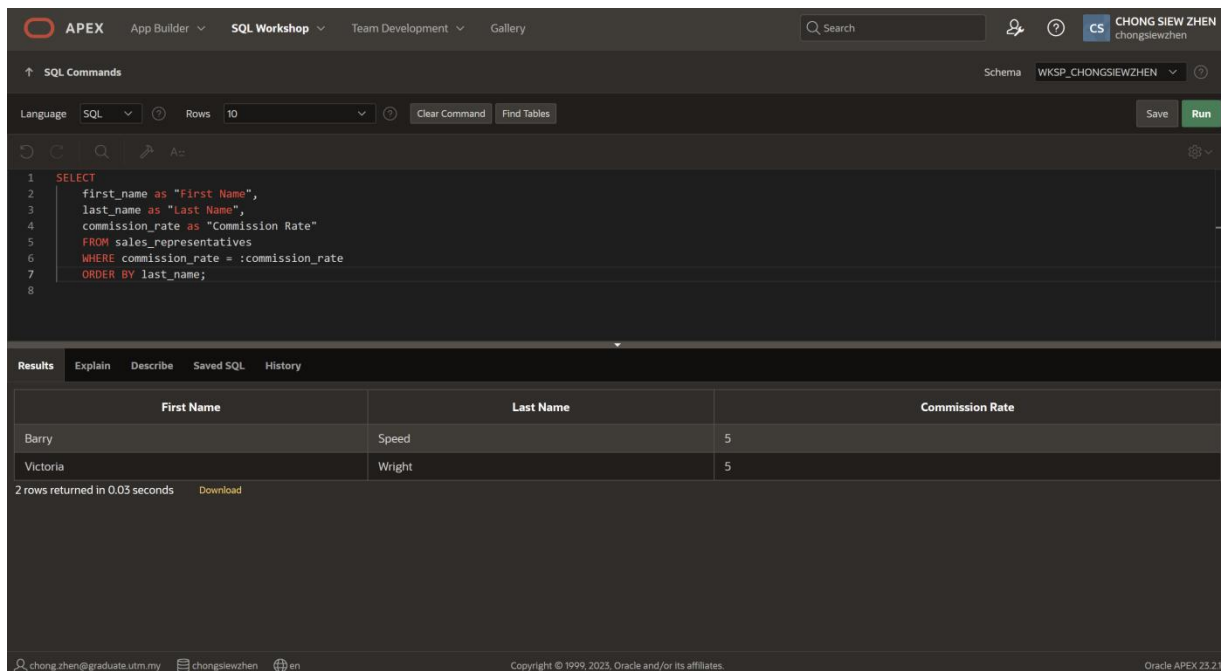
The footer of the interface includes the user information: chong.zhen@graduate.utm.my, chongsiewzhen, and the Oracle APEX version: Oracle APEX 23.21.

## 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.



| Bind Variable    | Value |
|------------------|-------|
| :COMMISSION_RATE | 5     |



```
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 = :commission_rate
7 ORDER BY last_name;
```

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

2 rows returned in 0.03 seconds

