



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

SECD 2523 –DATABASE

Lab 1: Data Definition Language (DDL)

Subject Name:	Database
Subject Code:	SECD2523
Semester:	1 - 2023/24
Lab Title:	Data Definition Language(DDL)
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Date of Submission:	15 December 2023
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Section 6 Lesson 3 Exercise : Data Definition Language

Use DDL to build and maintain database tables (S6L3 Objective 3)

Part 1: Reading information from a script

In this exercise you will use the “obl Sports.ddl” file to consolidate your knowledge of DDL.

Open the “obl Sports.ddl” in a text editor.

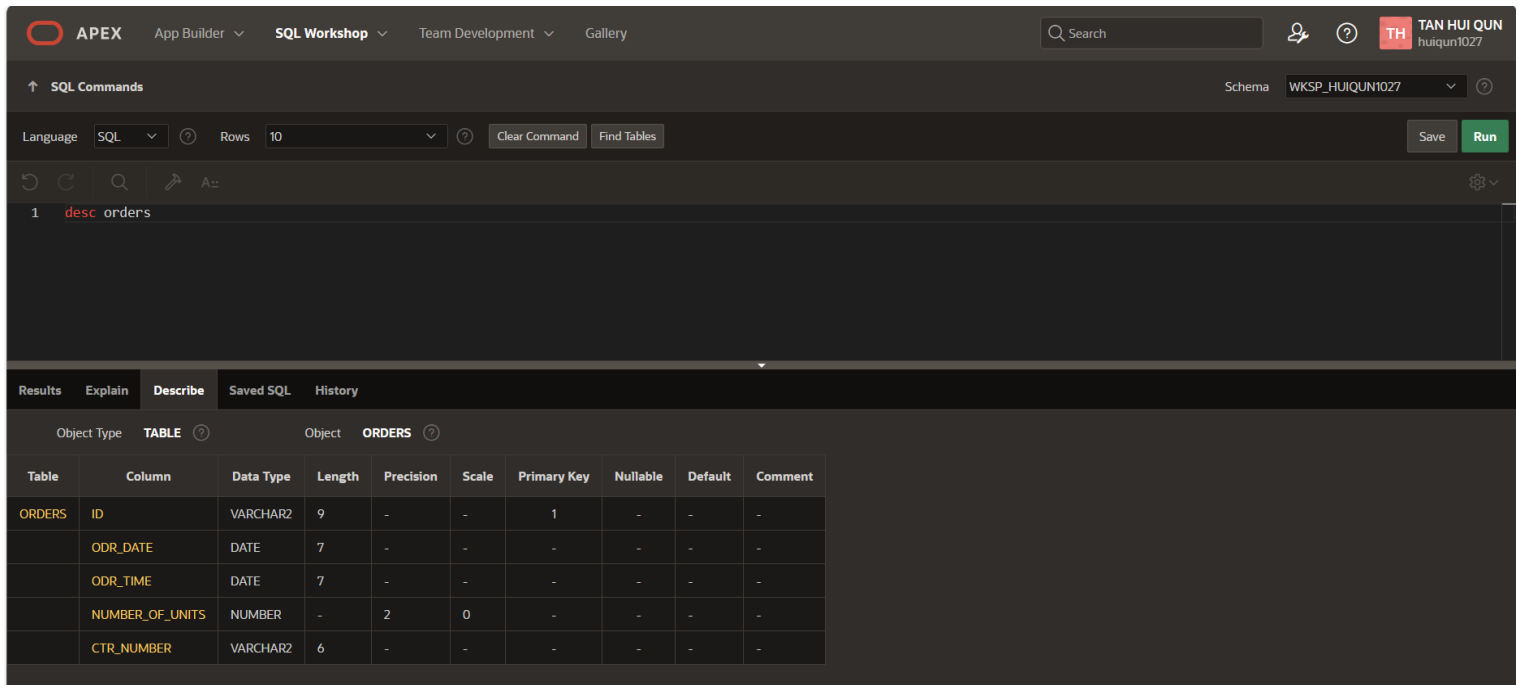
1. How many tables have been created using the CREATE TABLE statement?
10
2. How many columns are created for the price history table?
6
3. What statement is used to enforce the constraint that the category column of the items table must have a value?
NOT NULL
4. What is the name of the foreign key constraint between the customers and customer addresses tables?
customer_address_customer_fk
5. What are the lowest and highest values that can be stored in the commission_rate column for the sales_representatives table?
Lowest value: -99
Highest value: 99
6. What are the lowest and highest values that can be stored in the price column for the price_history table?
Lowest value: -99999.99
Highest value: 99999.99
7. What are the 3 columns that make up the primary key for the price_history table?
itm_number, start_date, start_time

Part 2 : Updating Constraints

Log-in to APEX and go to the SQL commands environment

Modifying a column

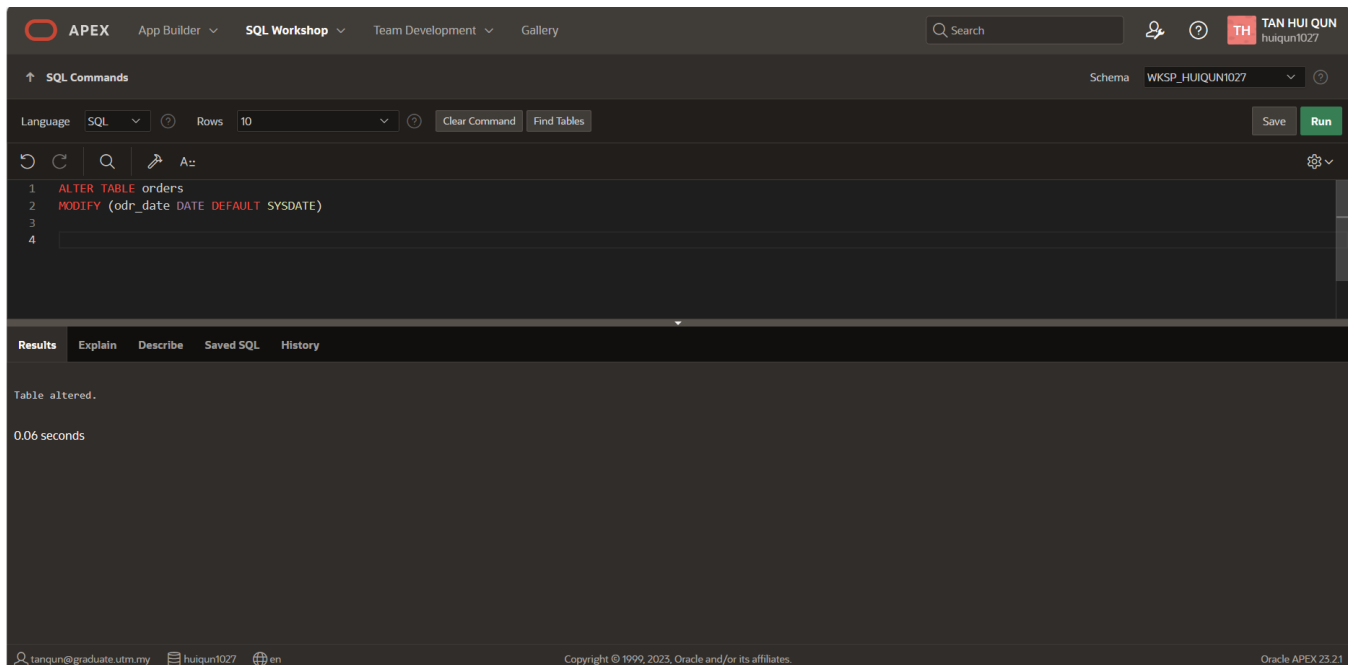
1. Run the DESCRIBE command on the orders table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'TAN HUI QUN' are on the right. The 'SQL Commands' section is active, showing a command 'desc orders' in the editor. Below the editor, the 'Describe' tab is selected, displaying the structure of the 'ORDERS' table.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ORDERS	ID	VARCHAR2	9	-	-	1	-	-	-
	ODR_DATE	DATE	7	-	-	-	-	-	-
	ODR_TIME	DATE	7	-	-	-	-	-	-
	NUMBER_OF_UNITS	NUMBER	-	2	0	-	-	-	-
	CTR_NUMBER	VARCHAR2	6	-	-	-	-	-	-

2. **Task:** Add a default constraint that will use today's date to assign a value to the odr_date column of the orders table if no date is provided.



The screenshot shows the APEX SQL Workshop interface with the 'SQL Commands' section. The command editor contains the following SQL commands:

```
1 ALTER TABLE orders
2 MODIFY (odr_date DATE DEFAULT SYSDATE)
3
4
```

The 'Results' tab is selected, showing the output: 'Table altered.' and '0.06 seconds'.

- Run the DESCRIBE command again to verify the command was successful.

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 'TAN HUI QUN huiqun1027' are on the right. The 'SQL Commands' section shows the command 'desc orders' entered in the editor. Below the editor, the 'Describe' tab is active, displaying the structure of the 'ORDERS' table. The table has five columns: ID, ODR_DATE, ODR_TIME, NUMBER_OF_UNITS, and CTR_NUMBER. The bottom status bar shows the user 'tanqun@graduate.utm.my' and the schema 'huiqun1027'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ORDERS	ID	VARCHAR2	9	-	-	1	-	-	-
	ODR_DATE	DATE	7	-	-	-	-	SYSDATE	-
	ODR_TIME	DATE	7	-	-	-	-	-	-
	NUMBER_OF_UNITS	NUMBER	-	2	0	-	-	-	-
	CTR_NUMBER	VARCHAR2	6	-	-	-	-	-	-

Adding a check constraint

- Run the DESCRIBE command on the customers table to view its structure.

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 'TAN HUI QUN huiqun1027' are on the right. The 'SQL Commands' section shows the command 'desc customers' entered in the editor. Below the editor, the 'Describe' tab is active, displaying the structure of the 'CUSTOMERS' table. The table has eight columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, and LOYALTY_CARD_NUMBER. The bottom status bar shows the user 'tanqun@graduate.utm.my' and the schema 'huiqun1027'.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-	-	-	-
	CURRENT_BALANCE	NUMBER	-	6	2	-	-	-	-
	SRE_ID	VARCHAR2	4	-	-	-	✓	-	-
	TEM_ID	VARCHAR2	4	-	-	-	✓	-	-
	LOYALTY_CARD_NUMBER	VARCHAR2	6	-	-	-	✓	-	-

2. **Task:** Add a check constraint that will not allow the customers current balance to go below zero.

The screenshot shows the APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'TAN HUI QUN' are on the right. The 'SQL Commands' section is active, showing a list of commands: 1. ALTER TABLE customers, 2. ADD CONSTRAINT cust_bal_ckeck, 3. CHECK (current_balance >= 0);, and 4. The 'Results' tab is selected, displaying the message 'Table altered.' and the execution time '0.04 seconds'. The bottom status bar shows the user 'tanqun@graduate.utm.my', the schema 'huiqun1027', and the version 'Oracle APEX 23.2'.

```
1 ALTER TABLE customers
2 ADD CONSTRAINT cust_bal_ckeck
3 CHECK (current_balance >= 0);
4
```

Results Explain Describe Saved SQL History

Table altered.

0.04 seconds

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3. Run the DESCRIBE command again to verify the command was successful.

The screenshot shows the APEX SQL Workshop interface with the 'DESCRIBE' command executed. The 'SQL Commands' section shows the command 'desc customers'. The 'Results' tab is selected, displaying a table with the structure of the 'CUSTOMERS' table. The table has 10 columns: Table, Column, Data Type, Length, Precision, Scale, Primary Key, Nullable, Default, and Comment. The columns are: CTR_NUMBER (VARCHAR2, 6), EMAIL (VARCHAR2, 50), FIRST_NAME (VARCHAR2, 20), LAST_NAME (VARCHAR2, 30), PHONE_NUMBER (VARCHAR2, 11), CURRENT_BALANCE (NUMBER, 6, 2), SRE_ID (VARCHAR2, 4), TEM_ID (VARCHAR2, 4), and LOYALTY_CARD_NUMBER (VARCHAR2, 6). The 'Primary Key' column shows '1' for CTR_NUMBER and '-' for the others. The 'Nullable' column shows '-' for all columns. The 'Default' and 'Comment' columns are empty.

```
1 desc customers
```

Results Explain Describe Saved SQL History

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-	-	-	-
	CURRENT_BALANCE	NUMBER	-	6	2	-	-	-	-
	SRE_ID	VARCHAR2	4	-	-	-	✓	-	-
	TEM_ID	VARCHAR2	4	-	-	-	✓	-	-
	LOYALTY_CARD_NUMBER	VARCHAR2	6	-	-	-	✓	-	-

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4. A check constraint is not shown in the results of a describe command.
 - a. Go to the Object Browser
 - b. Select the customers table.
 - c. Click on the CONSTRAINTS tab.
 - d. You will see your constraint here.

Search Condition	Related Constraint	Columns	Delete Rule	Status	Last Change	Index	Invalid
current_balance >= 0				ENABLED	12/15/2023		
"CTR_NUMBER" IS NOT NULL				ENABLED	12/15/2023		
"EMAIL" IS NOT NULL				ENABLED	12/15/2023		
"FIRST_NAME" IS NOT NULL				ENABLED	12/15/2023		
"LAST_NAME" IS NOT NULL				ENABLED	12/15/2023		
"PHONE_NUMBER" IS NOT NULL				ENABLED	12/15/2023		
"CURRENT_BALANCE" IS NOT NULL				ENABLED	12/15/2023		
		CTR_NUMBER		ENABLED	12/15/2023	CUSTOMER_PK	
		EMAIL		ENABLED	12/15/2023	CTR_EMAIL_UK	
		LOYALTY_CARD_NUMBER		ENABLED	12/15/2023	CTR_LCN_UK	

Adding a column

The client has decided that they would like a separate column for the customer's mobile phone number. This is an optional column that will be required to store 11 digits.

1. Run the DESCRIBE command on the customers table to view its structure.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-	-	-	-
	CURRENT_BALANCE	NUMBER	-	6	2	-	-	-	-
	SRE_ID	VARCHAR2	4	-	-	-	-	-	-
	TEM_ID	VARCHAR2	4	-	-	-	-	-	-
	LOYALTY_CARD_NUMBER	VARCHAR2	6	-	-	-	-	-	-

2. Task: Add column that will satisfy the clients requirements

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 is on the right. Below the navigation bar, the 'SQL Commands' window is active, showing the schema 'WKSP_HUIQUN1027'. The language is set to 'SQL' and the number of rows is '10'. The command entered is:

```
1 ALTER TABLE customers
2 ADD mobile_number VARCHAR2(11);
```

The 'Run' button is highlighted in green.

3. Run the DESCRIBE command on the customers table to view its structure.

The screenshot shows the Oracle APEX SQL Workshop interface with the 'DESCRIBE' command results for the 'CUSTOMERS' table. The command entered is:

```
1 desc customers
```

The 'Run' button is highlighted in green. Below the command window, the 'Describe' tab is selected, showing the table structure:

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-	-	-	-
	CURRENT_BALANCE	NUMBER	-	6	2	-	-	-	-
	SRE_ID	VARCHAR2	4	-	-	-	✓	-	-
	TEM_ID	VARCHAR2	4	-	-	-	✓	-	-
	LOYALTY_CARD_NUMBER	VARCHAR2	6	-	-	-	✓	-	-
	MOBILE_NUMBER	VARCHAR2	11	-	-	-	✓	-	-

The footer shows the user 'tanqun@graduate.utm.my', the workspace 'huiqun1027', and the version 'Oracle APEX 23.21'.

Dropping a column

The client has decided that they don't need the mobile number column as most customers only provide a single contact number and that is already catered for with the existing phone_number column.

1. Run the DESCRIBE command on the customers table to view its structure.

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 'TAN HUI QUN' are also present. The 'SQL Commands' section shows the command '1 desc customers' entered. Below the command, the 'Describe' tab is active, displaying the structure of the 'CUSTOMERS' table. The table has 10 columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, LOYALTY_CARD_NUMBER, and MOBILE_NUMBER. The 'MOBILE_NUMBER' column is highlighted in orange, indicating it is the focus of the task.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-	-	-	-
	CURRENT_BALANCE	NUMBER	-	6	2	-	-	-	-
	SRE_ID	VARCHAR2	4	-	-	-	✓	-	-
	TEM_ID	VARCHAR2	4	-	-	-	✓	-	-
	LOYALTY_CARD_NUMBER	VARCHAR2	6	-	-	-	✓	-	-
	MOBILE_NUMBER	VARCHAR2	11	-	-	-	✓	-	-

2. **Task:** Drop the column that was created to store the mobile phone number.

The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar is the same as the previous screenshot. The 'SQL Commands' section shows the command '1 ALTER TABLE customers' and '2 DROP COLUMN mobile_number' entered. Below the command, the 'Results' tab is active, displaying the message 'Table altered.' and the execution time '0.06 seconds'.

```
1 ALTER TABLE customers
2 DROP COLUMN mobile_number
```

Table altered.
0.06 seconds

3. Run the DESCRIBE command on the customers table to view its structure.

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

TH

TAN HUI QUN

huiqun1027

↑ SQL Commands

SchemaWKSP_HUIQUN1027

LanguageSQL

Rows10

Clear Command

Find Tables

Save

Run

1desc customers

2

Results

Explain

Describe

Saved SQL

History

Object TypeTABLE

ObjectCUSTOMERS

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-	-	-	-
	CURRENT_BALANCE	NUMBER	-	6	2	-	-	-	-
	SRE_ID	VARCHAR2	4	-	-	-	✓	-	-
	TEM_ID	VARCHAR2	4	-	-	-	✓	-	-
	LOYALTY_CARD_NUMBER	VARCHAR2	6	-	-	-	✓	-	-

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