



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

FACULTY OF COMPUTING
UTM Johor Bahru

SECD2523 – 08 Database

Semester I , Session 2023/2024

Lab 1 – DDL

Lecturer:

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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.

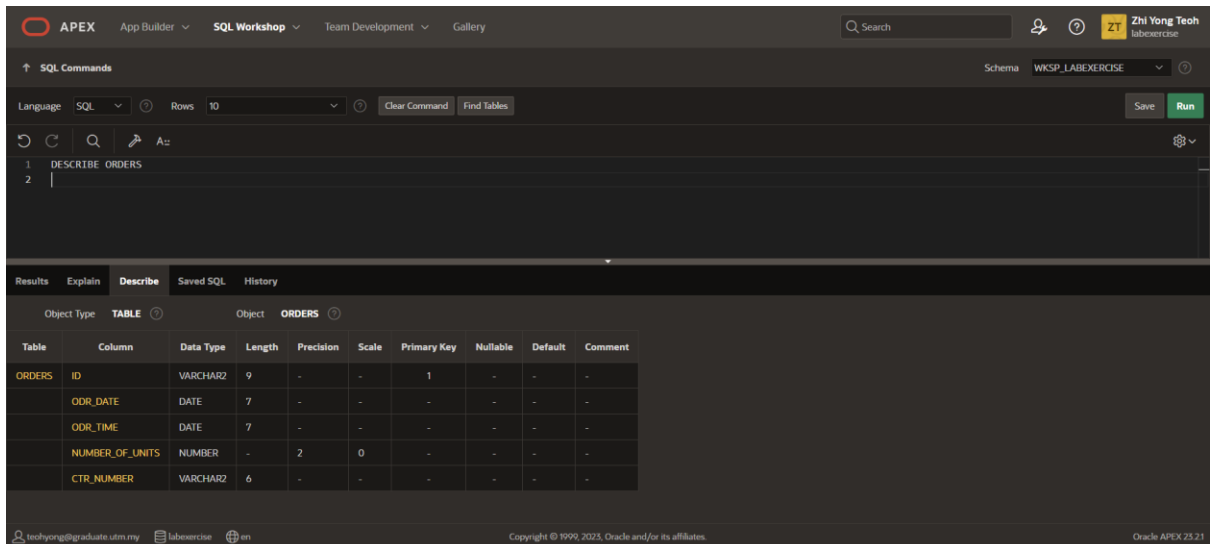
1. How many tables have been created using the CREATE TABLE statement?
10 tables have been created using the CREATE TABLE statement.
2. How many columns are created for the price history table?
6 columns are created for the price history table.
3. What statement is used to enforce the constraint that the category column of the items table must have a value?
‘NOT NULL’ statement is used to enforce the constraint that the category column of the items table must have a value.
4. What is the name of the foreign key constraint between the customers and customer addresses tables?
The foreign key constraint between the customers and customer address tables is 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?
The 3 columns that make up the primary key for the price_history table are itm_number, start_date, start_time

Part 2 : Updating Constraints

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

Modifying a column

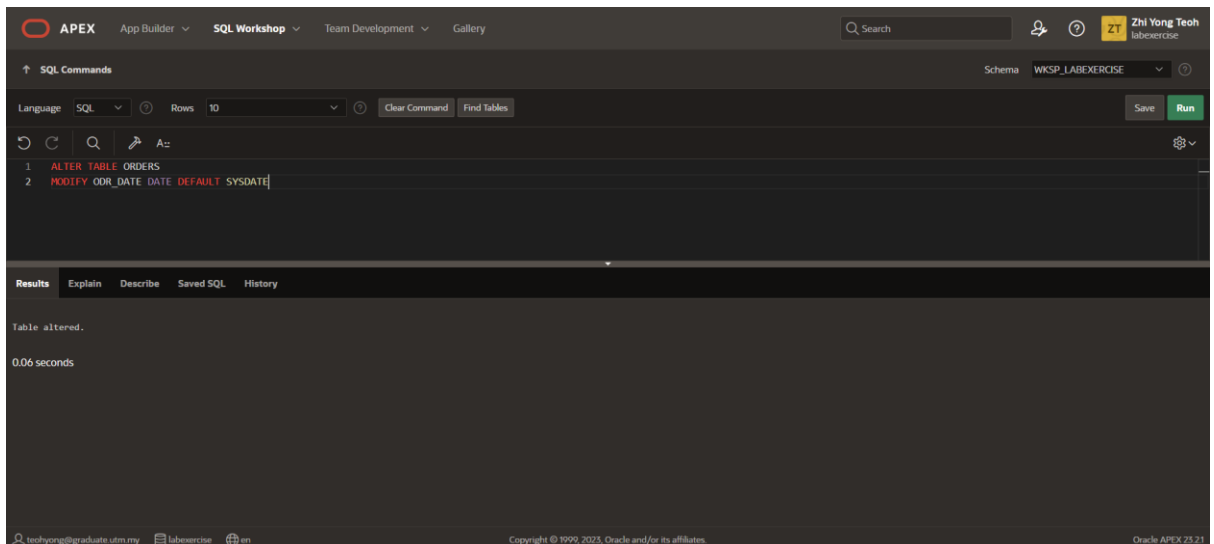
1. Run the DESCRIBE command on the orders table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The SQL Commands pane contains the command `DESCRIBE ORDERS`. The Results pane shows the table structure for 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. The SQL Commands pane contains the command `ALTER TABLE ORDERS MODIFY ODR_DATE DATE DEFAULT SYSDATE`. The Results pane shows the message "Table altered." and the execution time "0.06 seconds".

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

APEX

App Builder

SQL Workshop

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SQL Commands

Schema WKSP_LABEXERCISE

Language SQL

Rows 10

Clear Command

Find Tables

Save

Run

1

DESCRIBE ORDERS

Results

Explain

Describe

Saved SQL

History

Object Type TABLE

Object ORDERS

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	-	-	-	-	-	-

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Oracle APEX 23.23

Adding a check constraint

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

The screenshot shows the APEX SQL Workshop interface. The 'SQL Commands' tab is active, displaying the command 'DESCRIBE CUSTOMERS'. The 'Results' tab shows the table structure for 'CUSTOMERS'.

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 'SQL Commands' tab is active, displaying the following SQL commands:

```
1 ALTER TABLE CUSTOMERS
2 ADD CONSTRAINT CUST_CURRENT_BALANCE
3 CHECK (CURRENT_BALANCE >= 0)
```

The 'Results' tab shows the message 'Table altered.' and the execution time '0.04 seconds'.

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

The screenshot shows the Oracle APEX SQL Workshop interface. The 'SQL Commands' tab is active, displaying the command 'DESCRIBE CUSTOMERS'. The 'Results' tab shows the table structure for the 'CUSTOMERS' table. The table has 10 columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, and LOYALTY_CARD_NUMBER. The 'PRIMARY KEY' column indicates that CTR_NUMBER is the primary key. The 'NULLABLE' column shows that CTR_NUMBER, SRE_ID, TEM_ID, and LOYALTY_CARD_NUMBER are not nullable, while the others are. The 'Default' and 'Comment' columns are empty.

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	-	-	-	✓	-	-

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

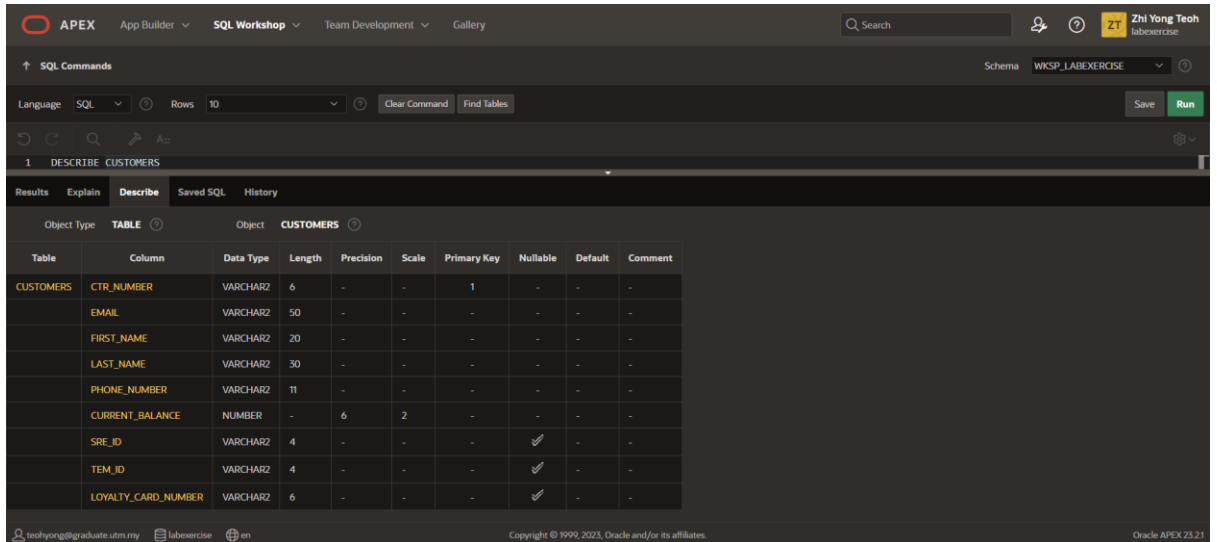
The screenshot shows the Oracle APEX Object Browser interface. The 'CUSTOMERS' table is selected, and the 'CONSTRAINTS' tab is active. The table lists 11 constraints: CUST_CURRENT_BALANCE, SYS_C0015802740, SYS_C0015802741, SYS_C0015802742, SYS_C0015802743, SYS_C0015802744, SYS_C0015802745, CUSTOMER_SALES_REP_FK, CUSTOMER_TEAM_FK, CUSTOMER_PK, and CTR_EMAIL_UK. The 'Type' column indicates the constraint type (Check, Foreign, Primary, Unique). The 'Search Condition' column shows the constraint definition. The 'Related Constraint' column shows the referenced constraint. The 'Columns' column shows the columns involved in the constraint. The 'Delete Rule' column shows the action taken when the referenced table is deleted. The 'Status' column shows the constraint status (ENABLED).

Constraint	Type	Search Condition	Related Constraint	Columns	Delete Rule	Status
CUST_CURRENT_BALANCE	Check	CURRENT_BALANCE >= 0				ENABLED
SYS_C0015802740	Check	"CTR_NUMBER" IS NOT NULL				ENABLED
SYS_C0015802741	Check	"EMAIL" IS NOT NULL				ENABLED
SYS_C0015802742	Check	"FIRST_NAME" IS NOT NULL				ENABLED
SYS_C0015802743	Check	"LAST_NAME" IS NOT NULL				ENABLED
SYS_C0015802744	Check	"PHONE_NUMBER" IS NOT NULL				ENABLED
SYS_C0015802745	Check	"CURRENT_BALANCE" IS NOT NULL				ENABLED
CUSTOMER_SALES_REP_FK	Foreign		SALES_REPRESENTATIVE_P...	SRE_ID	NO ACTION	ENABLED
CUSTOMER_TEAM_FK	Foreign		TEAM_PK (WKSP_LABEXER...	TEM_ID	NO ACTION	ENABLED
CUSTOMER_PK	Primary			CTR_NUMBER		ENABLED
CTR_EMAIL_UK	Unique			EMAIL		ENABLED

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.

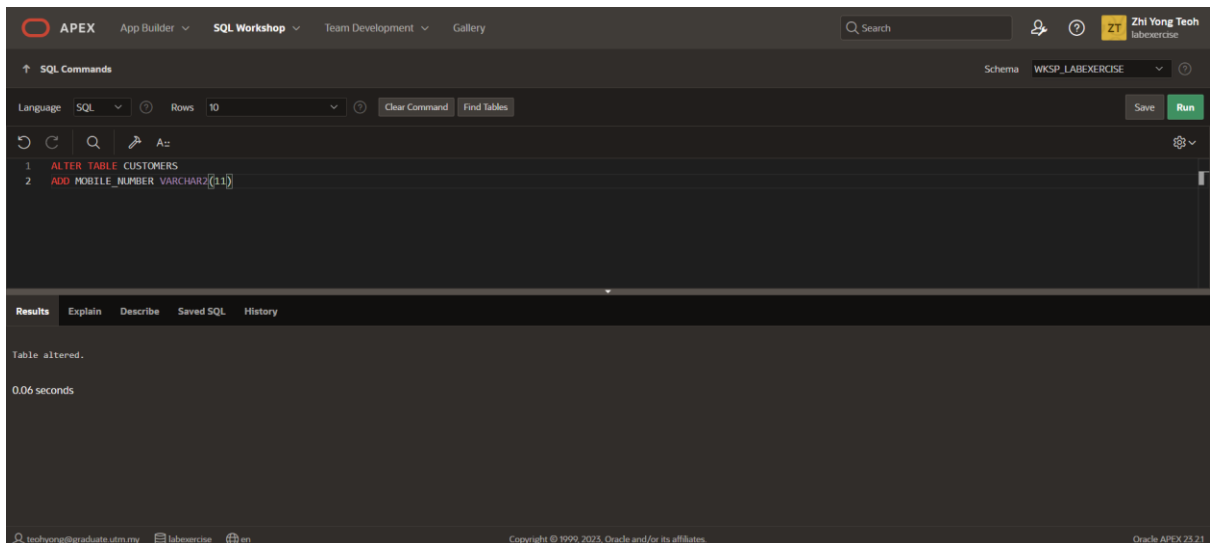
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The 'SQL Commands' tab is active, and the command 'DESCRIBE CUSTOMERS' has been executed. The 'Describe' tab is selected, displaying the table structure for the 'CUSTOMERS' table. The table has 10 columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, and LOYALTY_CARD_NUMBER. The 'PHONE_NUMBER' column is highlighted in yellow, indicating it is the column being added.

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 APEX SQL Workshop interface. The 'SQL Commands' tab is active, and the command 'ALTER TABLE CUSTOMERS ADD MOBILE_NUMBER VARCHAR2(11)' has been executed. The 'Results' tab is selected, displaying the message 'Table altered.' and the execution time '0.06 seconds'.

```
1 ALTER TABLE CUSTOMERS
2 ADD MOBILE_NUMBER VARCHAR2(11)
```

Results

Table altered.

0.06 seconds

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

The screenshot shows the Oracle APEX SQL Workshop interface. The 'SQL Commands' tab is active, and the command 'DESCRIBE CUSTOMERS' has been executed. The results are displayed in a table format, showing 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 data types, lengths, and other attributes are listed for each column.

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	-	-	-	✓	-	-

Dropping a column

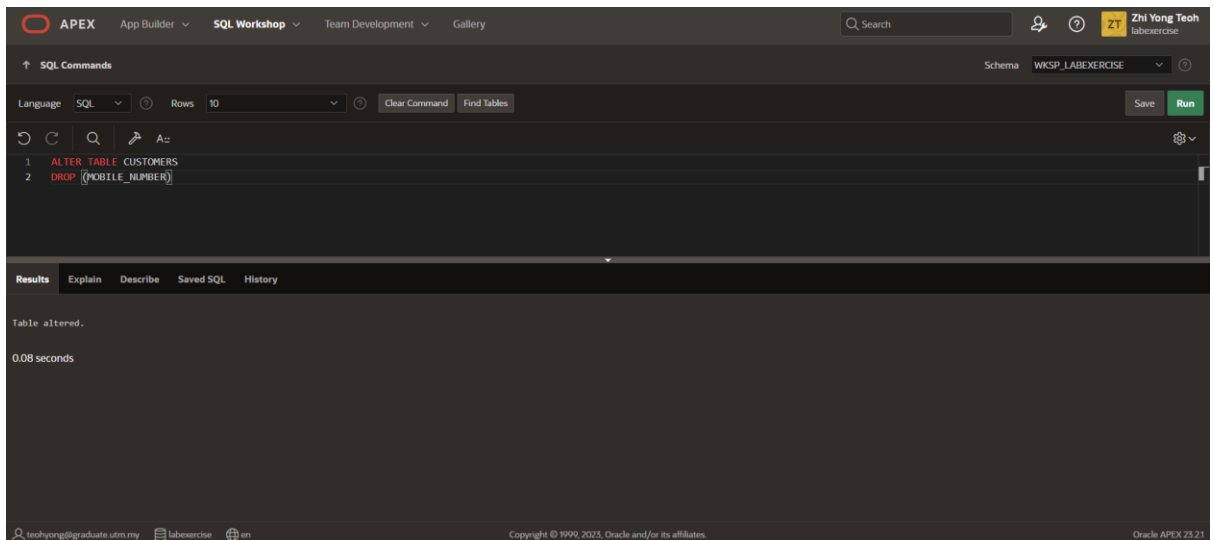
The client has decided that they don't need the mobile number column as most customers only provide a single contact number and that is already catered for with the existing phone_number column.

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

The screenshot shows the Oracle APEX SQL Workshop interface. The 'SQL Commands' tab is active, and the command 'DESCRIBE CUSTOMERS' has been executed. The results are displayed in a table format, showing 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 data types, lengths, and other attributes are listed for each column.

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.



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

