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**SECD2523-01 PANGKALAN DATA
(DATABASE)
LAB 1 DATA DEFINITION LANGUAGE
(DDL)
SEMESTER 1 (2023/2024)**

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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 columns
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 'AMIRAH FAIAH #utm123' are on the right. The 'SQL Commands' section shows the command 'DESC orders;' entered. Below the command, the 'Describe' tab is active, displaying a table structure for 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 'faiah0804@gmail.com', workspace 'futm123', and 'Oracle APEX 23.2.0-17'.

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 entered is:
1 ALTER TABLE orders
2 modify (odr_date DATE DEFAULT SYSDATE);
The 'Results' tab is active, showing the message 'Table altered.' and the execution time '0.06 seconds'. The bottom status bar shows the user 'faiah0804@gmail.com', workspace 'futm123', and 'Oracle APEX 23.2.0-17'.

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

The screenshot shows the APEX SQL Workshop interface. The 'SQL Commands' tab is active, displaying the command `DESC orders;`. The 'Results' tab is selected, showing the structure of the `ORDERS` table. The table has the following columns:

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	-	-	-	-	-	-

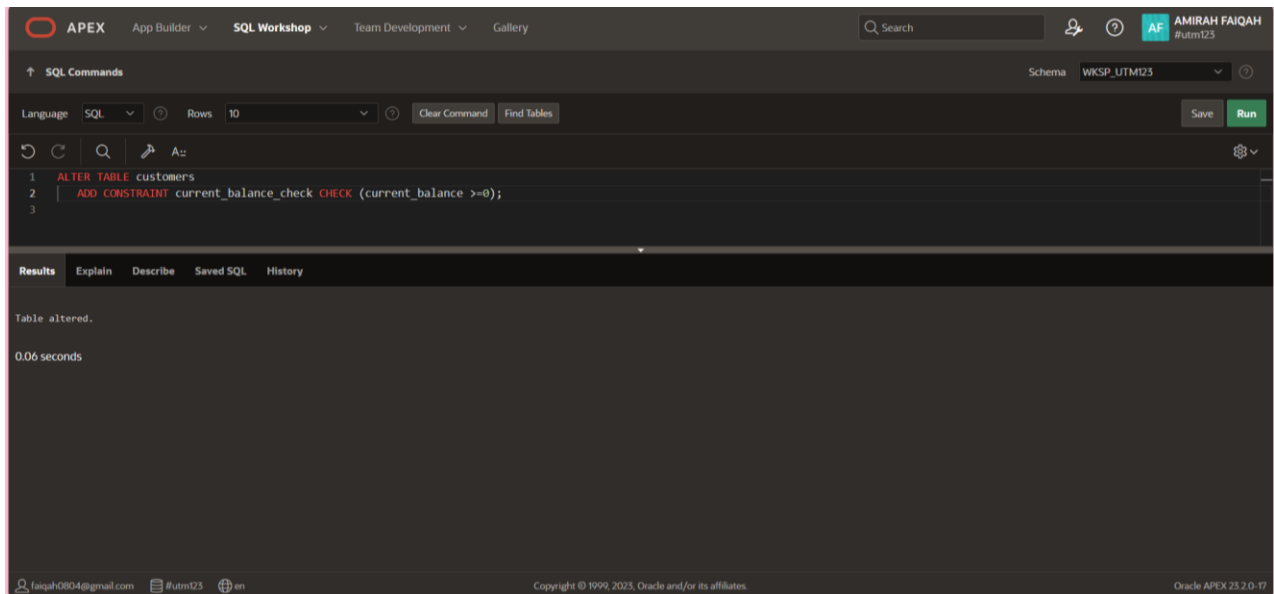
Adding a check constraint

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

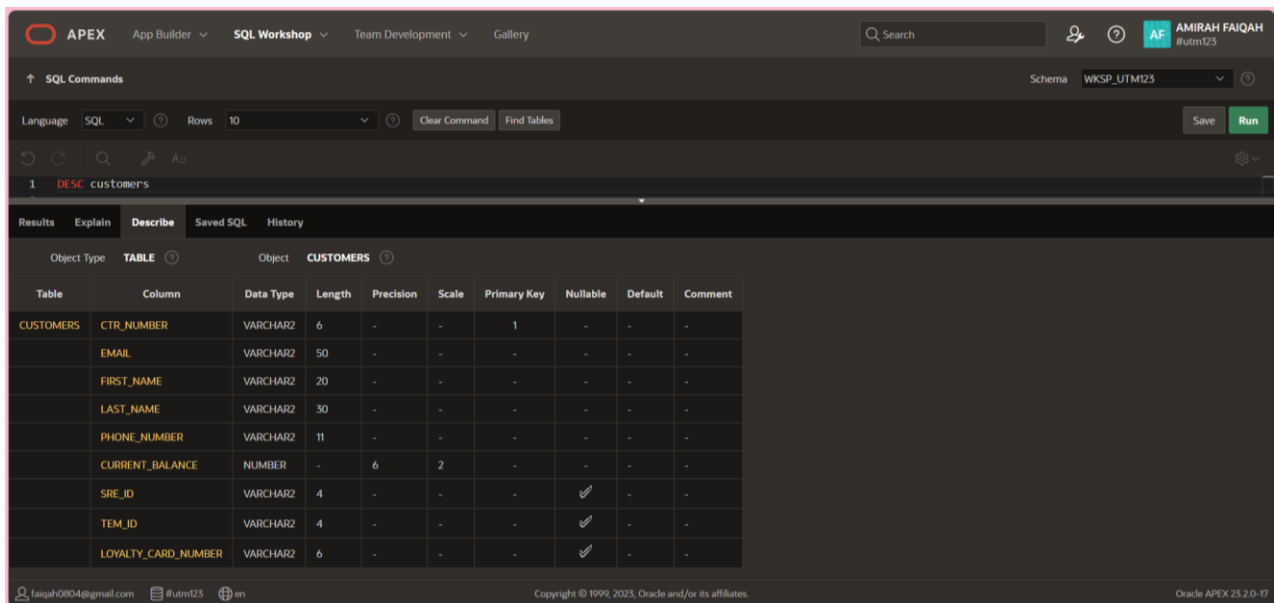
The screenshot shows the APEX SQL Workshop interface. The 'SQL Commands' tab is active, displaying the command `DESC customers`. The 'Results' tab is selected, showing the structure of the `CUSTOMERS` table. The table has the following columns:

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.



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



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.

Object Browser: Schema WKSP_UTM123

Object: CUSTOMERS

Tab: CONSTRAINTS

Constraint	Type	Search Condition	Related Constraint	Columns	Delete Rule
CURRENT_BALANCE_CHECK	Check	current_balance >= 0			
SYS_C00148982156	Check	"CTR_NUMBER" IS NOT NULL			
SYS_C00148982157	Check	"EMAIL" IS NOT NULL			
SYS_C00148982158	Check	"FIRST_NAME" IS NOT NULL			
SYS_C00148982159	Check	"LAST_NAME" IS NOT NULL			
SYS_C00148982160	Check	"PHONE_NUMBER" IS NOT NULL			
SYS_C00148982161	Check	"CURRENT_BALANCE" IS NOT NULL			
CUSTOMER_SALES_REP_FK	Foreign		SALES_REPRESENTATIVE_PK ...	SRE_ID	NO ACTION
CUSTOMER_TEAM_FK	Foreign		TEAM_PK (WKSP_UTM123.TE...	TEM_ID	NO ACTION
CUSTOMER_PK	Primary			CTR_NUMBER	
CTR_EMAIL_UK	Unique			EMAIL	

1 cells selected

Object Browser: Schema WKSP_UTM123

Object: CUSTOMERS

Tab: CONSTRAINTS

Constraint	Type	Search Condition	Related Constraint	Columns	Delete Rule
SYS_C00148982156	Check	"CTR_NUMBER" IS NOT NULL			
SYS_C00148982157	Check	"EMAIL" IS NOT NULL			
SYS_C00148982158	Check	"FIRST_NAME" IS NOT NULL			
SYS_C00148982159	Check	"LAST_NAME" IS NOT NULL			
SYS_C00148982160	Check	"PHONE_NUMBER" IS NOT NULL			
SYS_C00148982161	Check	"CURRENT_BALANCE" IS NOT NULL			
CUSTOMER_SALES_REP_FK	Foreign		SALES_REPRESENTATIVE_PK ...	SRE_ID	NO ACTION
CUSTOMER_TEAM_FK	Foreign		TEAM_PK (WKSP_UTM123.TE...	TEM_ID	NO ACTION
CUSTOMER_PK	Primary			CTR_NUMBER	
CTR_EMAIL_UK	Unique			EMAIL	
CTR_LCN_UK	Unique			LOYALTY_CARD_NUMBER	

1 cells selected

Oracle APEX SQL Workshop interface showing the **CUSTOMERS** table constraints for schema **WKSP_UTM123**.

Object Browser: Tables, CUSTOMERS, CUSTOMERS_ADDRESSES, HTMLDB_PLAN_TABLE, INVENTORY_LIST, ITEMS, ORDERED_ITEMS, ORDERS, PRICE_HISTORY, SALES_REPRESENTATIVES, SALES_REP_ADDRESSES, TEAMS, Views, Indexes, Sequences, Types, Packages, Procedures.

Constraints Tab:

Related Constraint	Columns	Delete Rule	Status	Last Change	Index	Invalid
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
SALES_REPRESENTATIVE_PK ...	SRE_ID	NO ACTION	ENABLED	11/05/2023		
TEAM_PK (WKSP_UTM123.TE...	TEM_ID	NO ACTION	ENABLED	11/05/2023		
	CTR_NUMBER		ENABLED	11/05/2023	CUSTOMER_PK	
	EMAIL		ENABLED	11/05/2023	CTR_EMAIL_UK	

1 cells selected | 1 - 12 of 12

Oracle APEX SQL Workshop interface showing the **CUSTOMERS** table constraints for schema **WKSP_UTM123**.

Object Browser: Tables, CUSTOMERS, CUSTOMERS_ADDRESSES, HTMLDB_PLAN_TABLE, INVENTORY_LIST, ITEMS, ORDERED_ITEMS, ORDERS, PRICE_HISTORY, SALES_REPRESENTATIVES, SALES_REP_ADDRESSES, TEAMS, Views, Indexes, Sequences, Types, Packages, Procedures.

Constraints Tab:

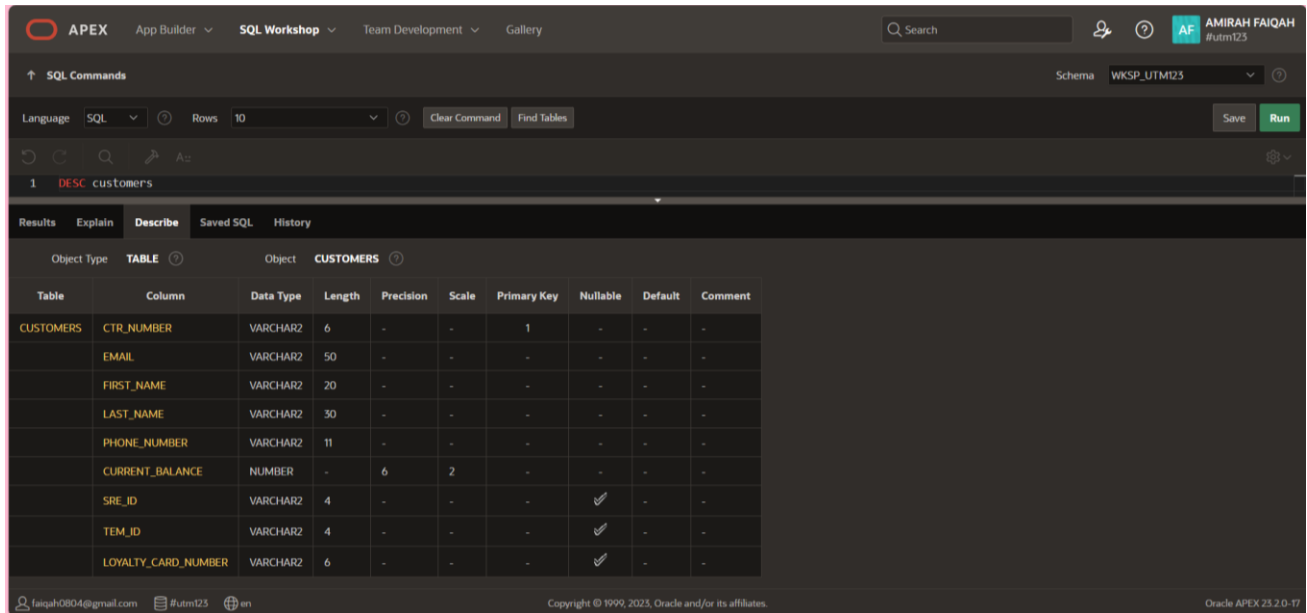
Related Constraint	Columns	Delete Rule	Status	Last Change	Index	Invalid
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
			ENABLED	11/05/2023		
SALES_REPRESENTATIVE_PK ...	SRE_ID	NO ACTION	ENABLED	11/05/2023		
TEAM_PK (WKSP_UTM123.TE...	TEM_ID	NO ACTION	ENABLED	11/05/2023		
	CTR_NUMBER		ENABLED	11/05/2023	CUSTOMER_PK	
	EMAIL		ENABLED	11/05/2023	CTR_EMAIL_UK	
	LOYALTY_CARD_NUMBER		ENABLED	11/05/2023	CTR_LCN_UK	

1 cells selected | 1 - 12 of 12

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.

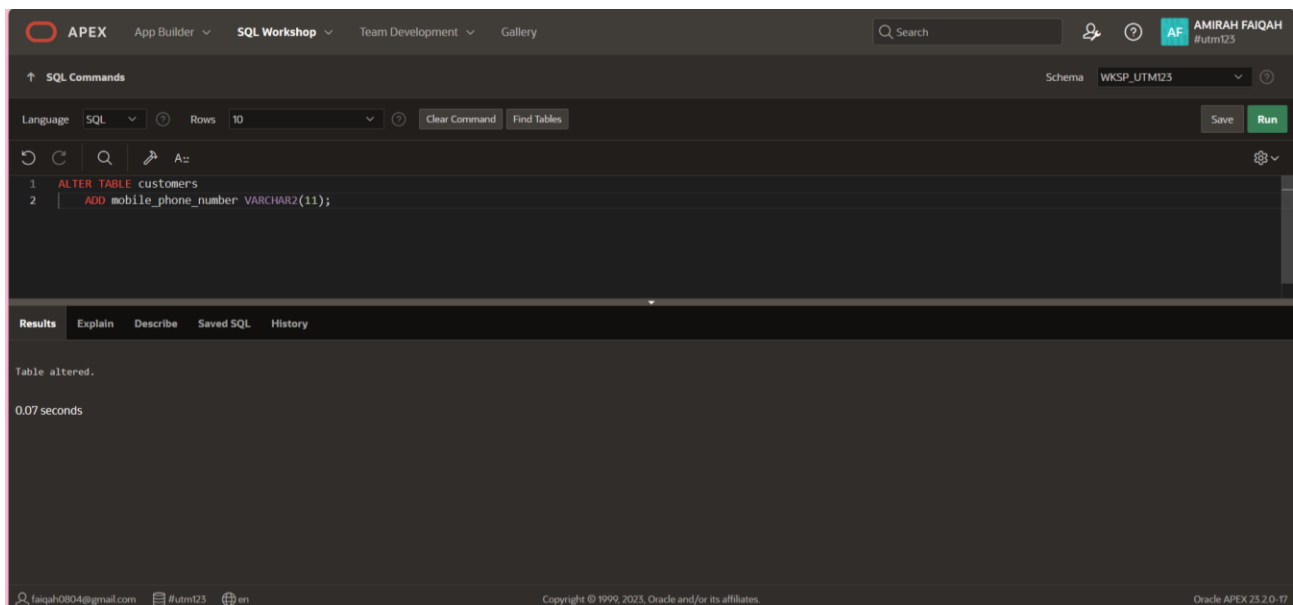
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The 'SQL Commands' tab is active, and the command 'DESC customers' has been executed. The results are displayed in a table format under the 'Describe' tab.

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_phone_number VARCHAR2(11);' has been executed. The results are displayed in a table format under the 'Results' tab.

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	-	-	-	✓	-	-

3. 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 'DESC customers'. The 'Results' tab is selected, showing the table structure for 'CUSTOMERS'. 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_PHONE_NUMBER. The 'MOBILE_PHONE_NUMBER' column is highlighted in yellow.

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_PHONE_NUMBER	VARCHAR2	11	-	-	-	✓	-	-

Dropping a column

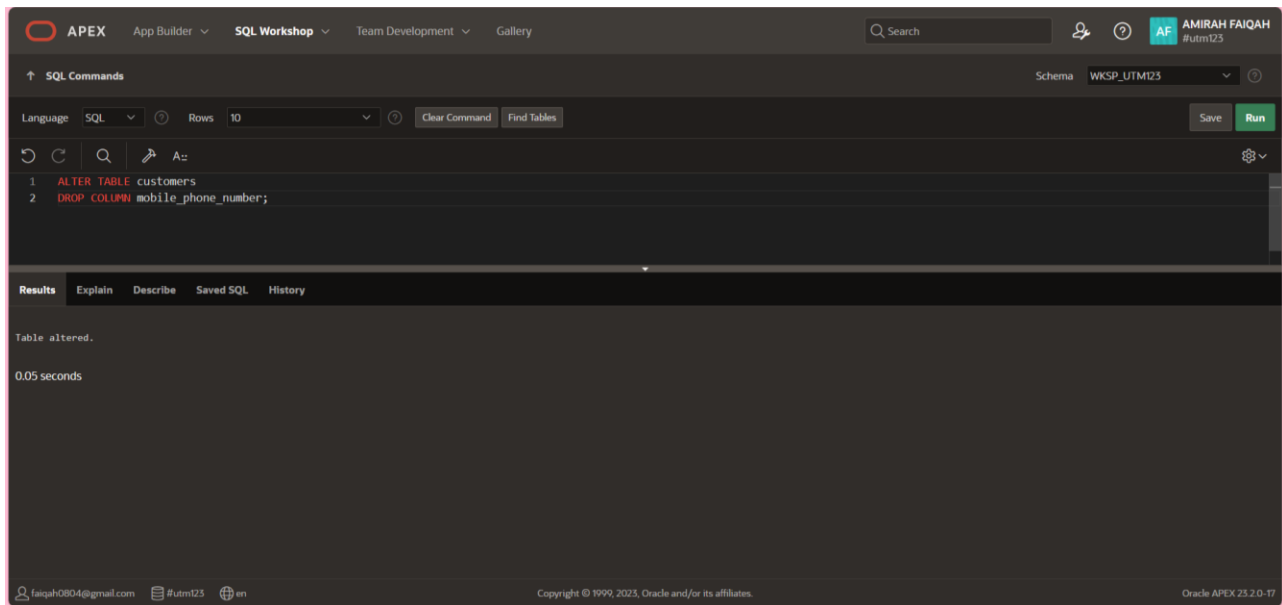
The client has decided that they don't need the mobile number column as most customers only provide a single contact number and that is already catered for with the existing phone_number column.

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

This screenshot is identical to the one above, showing the APEX SQL Workshop interface with the 'DESCRIBE customers' command results. The table structure for 'CUSTOMERS' is displayed, including the 'MOBILE_PHONE_NUMBER' column which is highlighted in yellow.

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_PHONE_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.

