



UTM
UNIVERSITI TEKNOLOGI MALAYSIA

SESSION 2023/2024, SEMESTER 3

SECD2523 - DATABASE

SECTION 10

SQL 1 : DDL

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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 CREATE TABLE statement

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?

0 - 99

6. What are the lowest and highest values that can be stored in the price column for the price_history table?

00000.00 - 99999.99

7. What are the 3 columns that make up the primary key for the price_history table?

I. itm_number

II. start_date

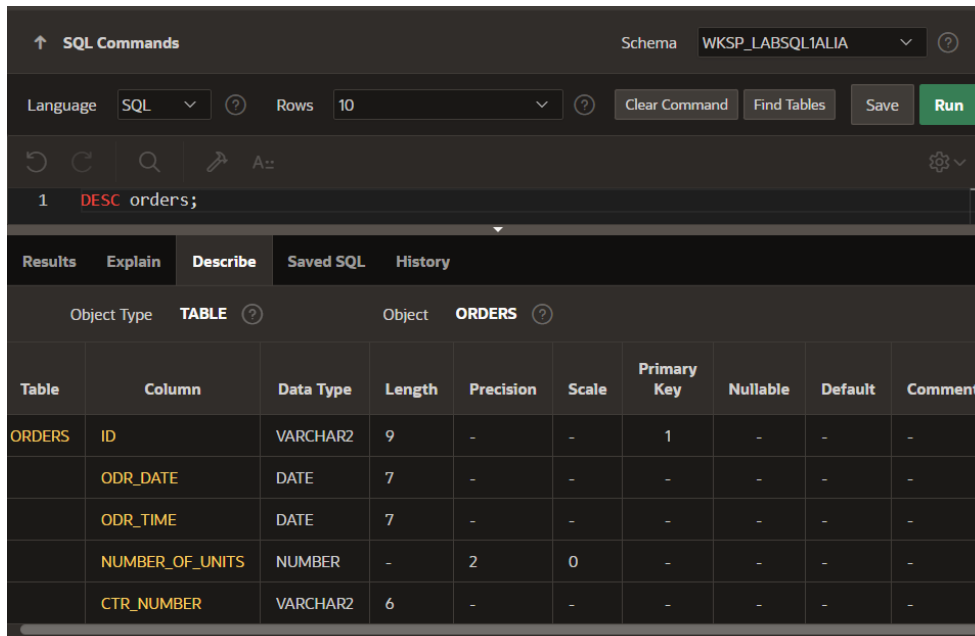
III. start_time

Part 2 : Updating Constraints

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

Modifying a column

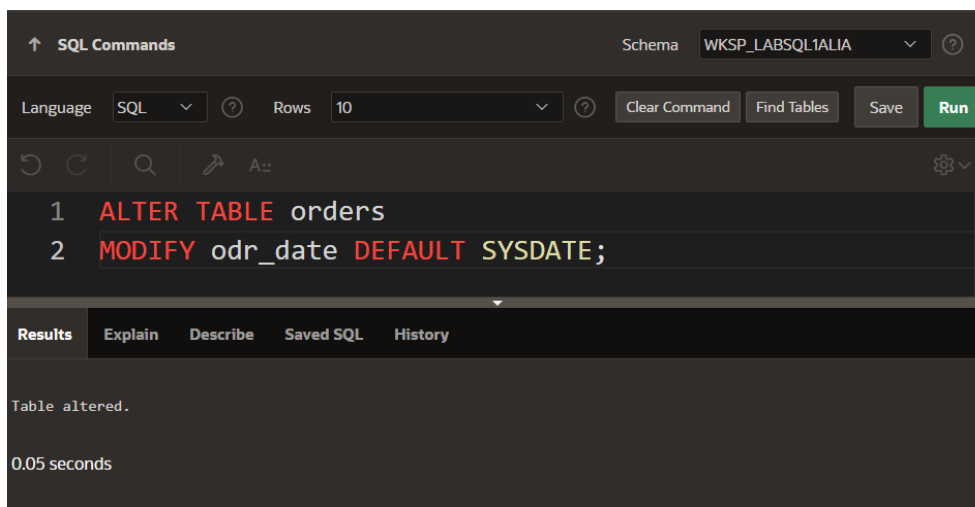
1. Run the DESCRIBE command on the orders table to view its structure.



The screenshot shows the SQL Commands interface with the command `DESC orders;` entered. 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.

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 SQL Commands interface with the command `ALTER TABLE orders MODIFY odr_date DEFAULT SYSDATE;` entered. The 'Results' tab is active, displaying the message 'Table altered.' and the execution time '0.05 seconds'.

```
1 ALTER TABLE orders
2 MODIFY odr_date DEFAULT SYSDATE;
```

Table altered.
0.05 seconds

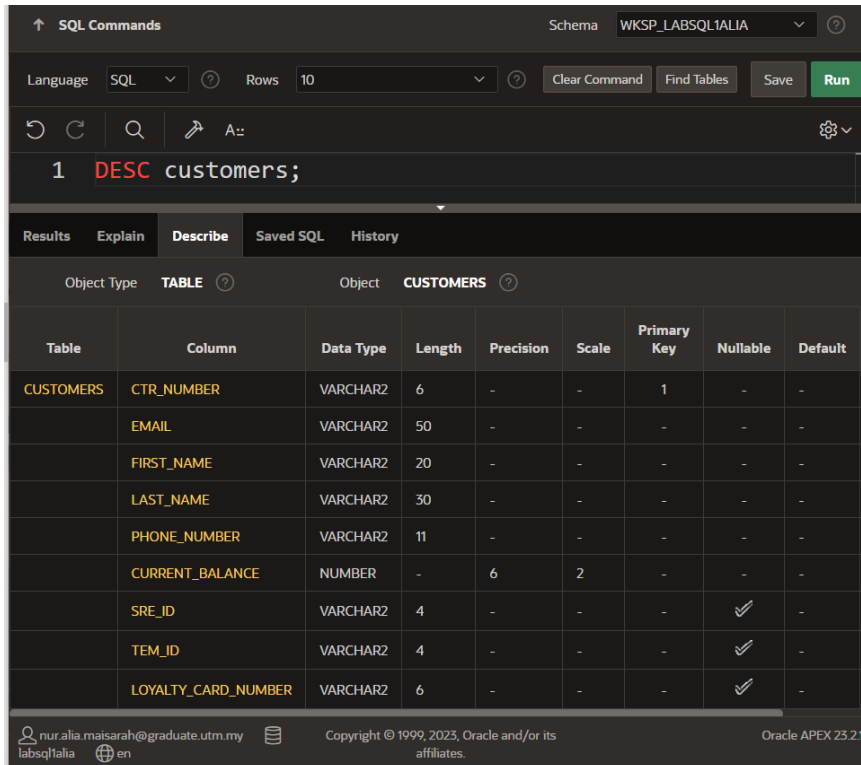
- Run the DESCRIBE command again to verify the command was successful.

The screenshot shows the SQL Developer interface. At the top, the 'SQL Commands' tab is active, with the schema set to 'WKSP_LABSQL1ALIA'. The command 'DESC orders;' is entered in the SQL editor. Below the editor, the 'Describe' tab is selected, displaying the structure of the 'ORDERS' table. The table has five columns: ID, ODR_DATE, ODR_TIME, NUMBER_OF_UNITS, and CTR_NUMBER. The 'ID' column is the primary key.

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

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

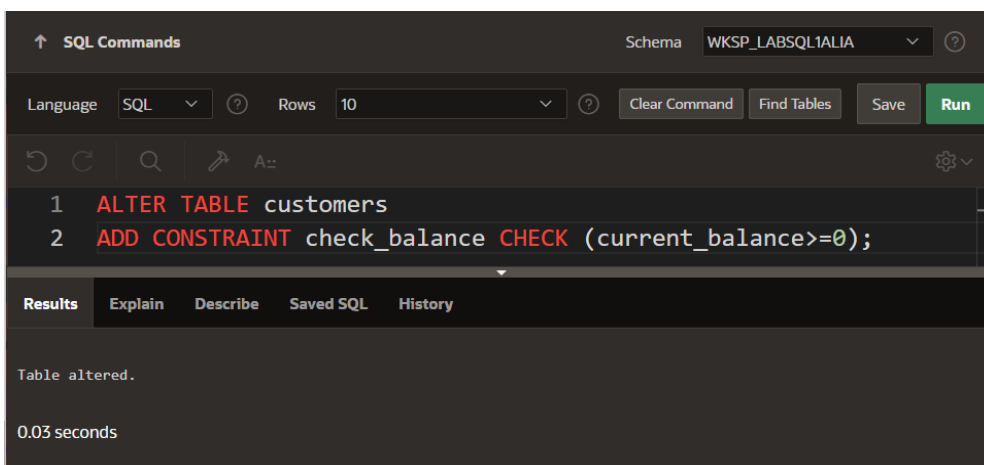


The screenshot shows the SQL Developer interface with the SQL Commands window. The command `DESC customers;` has been executed. The results are displayed in the 'Describe' tab, showing the structure of the **CUSTOMERS** table.

Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default
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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2. Task: Add a check constraint that will not allow the customers current balance to go below zero.



The screenshot shows the SQL Developer interface with the SQL Commands window. The command `ALTER TABLE customers ADD CONSTRAINT check_balance CHECK (current_balance >= 0);` has been executed. The results show 'Table altered.' and the execution time '0.03 seconds'.

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

Results: Table altered.
0.03 seconds

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

The screenshot shows the 'SQL Commands' window with the command `DESC customers;` entered. The 'Run' button is highlighted. Below the command, the 'Describe' tab is active, displaying the structure of the 'CUSTOMERS' table.

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	-	-	-	✓	-	-

- 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.

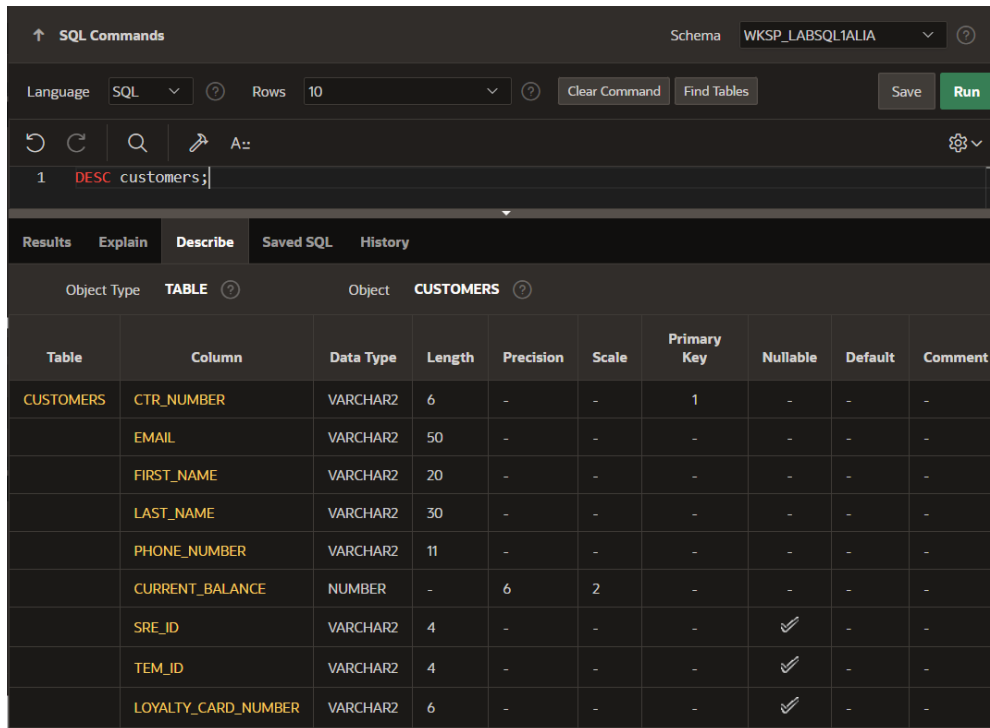
The screenshot shows the 'Object Browser' window with the 'CUSTOMERS' table selected. The 'Constraints' tab is active, displaying a list of constraints.

Constraint	Type	Search Condition	Related Constraint	Columns	Delete Rule
CHECK_BALANCE	Check	current_balance>=0			
SYS_C00150699466	Check	"CTR_NUMBER" IS NOT NULL			
SYS_C00150699467	Check	"EMAIL" IS NOT NULL			
SYS_C00150699468	Check	"FIRST_NAME" IS NOT NULL			
SYS_C00150699469	Check	"LAST_NAME" IS NOT NULL			
SYS_C00150699470	Check	"PHONE_NUMBER" IS NOT NULL			
SYS_C00150699471	Check	"CURRENT_BALANCE" IS NOT NULL			
CUSTOMER_PK	Primary			CTR_NUMBER	
CTR_EMAIL_UK	Unique			EMAIL	
CTR_LCN_UK	Unique			LOYALTY_CARD_NUMBER	

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.

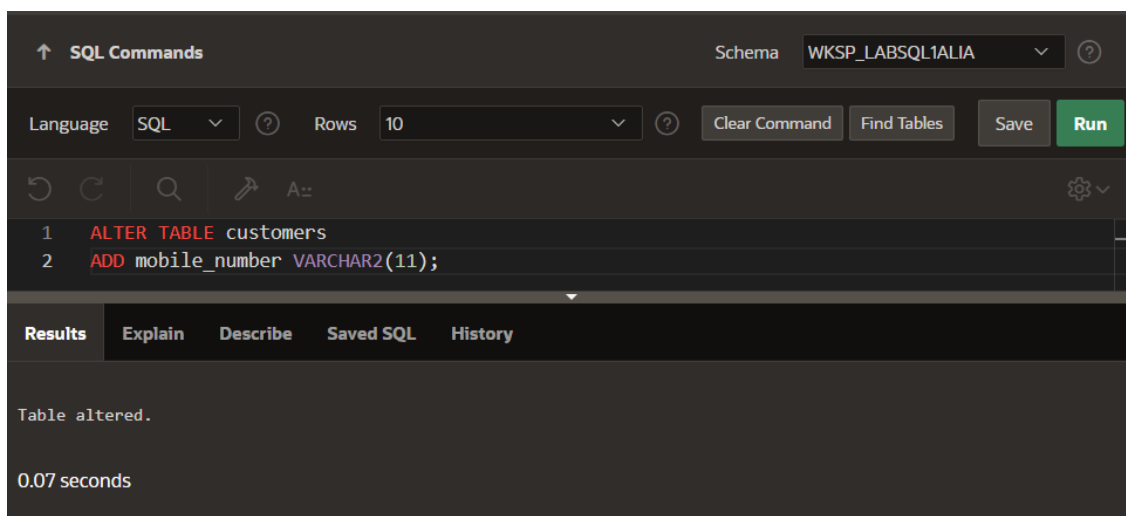
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows the SQL Developer interface with the 'SQL Commands' window. The 'Schema' is set to 'WKSP_LABSQL1ALIA'. The 'Language' is 'SQL' and 'Rows' is set to 10. The command entered is 'DESC customers;'. The 'Describe' tab is selected, showing the structure of the 'CUSTOMERS' table.

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 SQL Developer interface with the 'SQL Commands' window. The 'Schema' is set to 'WKSP_LABSQL1ALIA'. The 'Language' is 'SQL' and 'Rows' is set to 10. The command entered is 'ALTER TABLE customers ADD mobile_number VARCHAR2(11);'. The 'Results' tab is selected, showing the execution result.

Results	Explain	Describe	Saved SQL	History
Table altered.				
0.07 seconds				

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

SQL Commands

Schema: WKSP_LABSQLITALIA

Language: SQL Rows: 10 Clear Command Find Tables Save Run

1 DESC customers;

Results Explain Describe Saved SQL History

Object Type: TABLE Object: 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	-	-	-	✓	-	-
	MOBILE_NUMBER	VARCHAR2	11	-	-	-	✓	-	-

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labsqlitalia

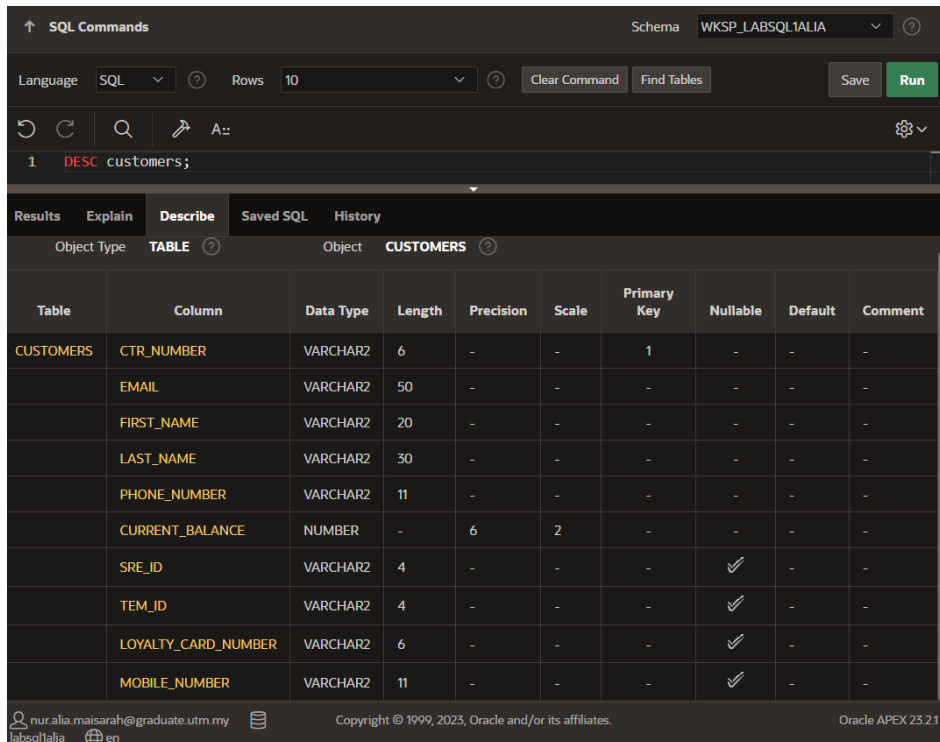
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Dropping a column

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.

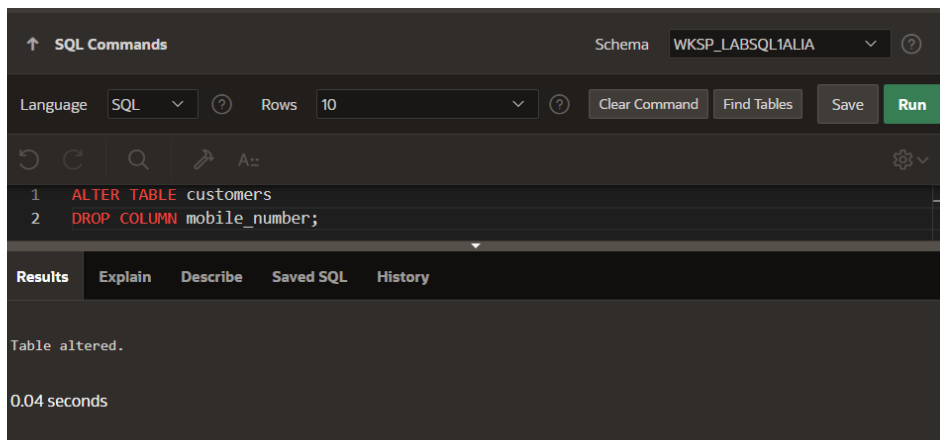
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows the SQL Developer interface with the SQL Commands window. The command `DESC customers;` has been executed. The Results tab is active, 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, LOYALTY_CARD_NUMBER, and MOBILE_NUMBER. The MOBILE_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_NUMBER	VARCHAR2	11	-	-	-	✓	-	-

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



The screenshot shows the SQL Developer interface with the SQL Commands window. The command `ALTER TABLE customers DROP COLUMN mobile_number;` has been executed. The Results tab is active, displaying the message "Table altered." and the execution time "0.04 seconds".

Results	Explain	Describe	Saved SQL	History
Table altered.				
0.04 seconds				

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

↑ SQL Commands

Schema WKSP_LABSQL1ALIA

Language SQL Rows 10 Clear Command Find Tables Save Run

1 DESC customers;

Results Explain Describe Saved SQL History

Object Type TABLE Object 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	-	-	-	✓	-	-