



SECD2523 - DATABASE

SEMESTER 1/20232024

SECTION 08

LAB 1 - DDL

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|--------------|------------|
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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

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?

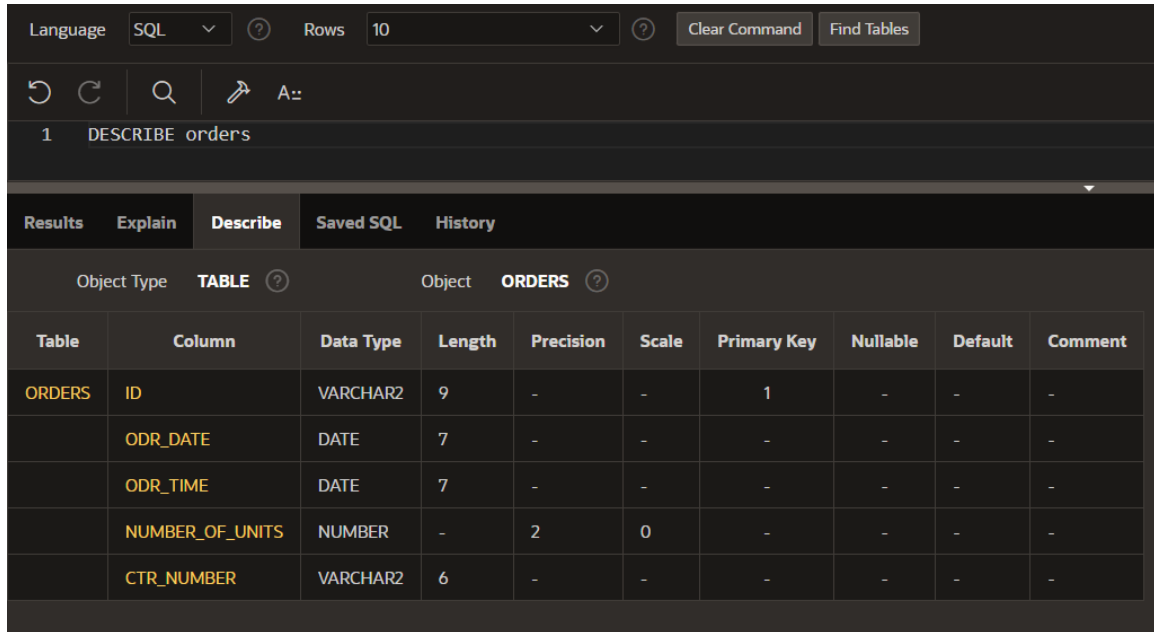
itm_number, start_date, start_time

Part 2 : Updating Constraints

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

Modifying a column

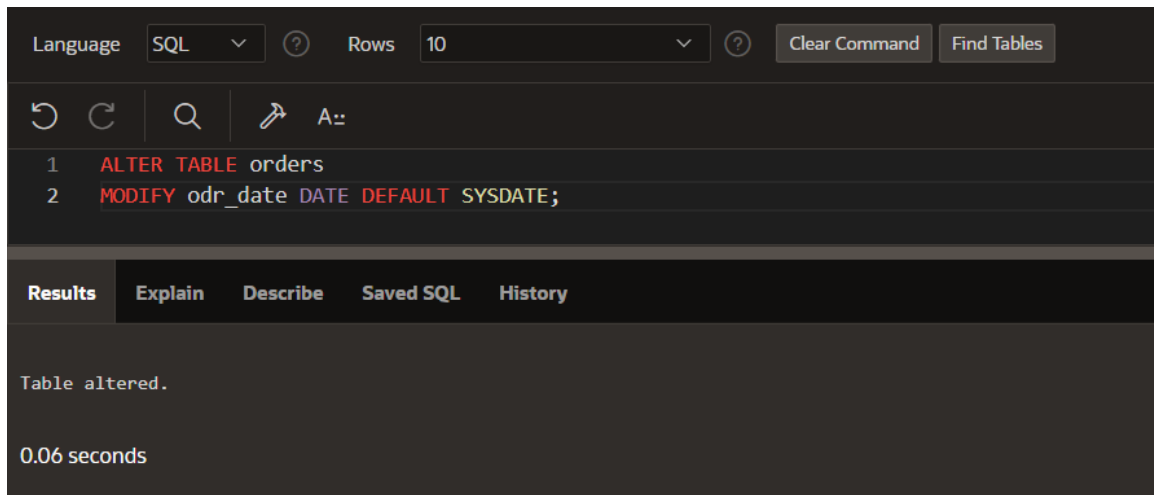
1. Run the DESCRIBE command on the orders table to view its structure.



The screenshot shows the APEX SQL environment interface. At the top, there are controls for Language (SQL), Rows (10), and buttons for Clear Command and Find Tables. Below this is a command input area with a refresh icon, a search icon, and a command prompt icon, followed by the command: 1 DESCRIBE orders. The results are displayed in a table with tabs for Results, Explain, Describe, Saved SQL, and History. The Describe tab is active, showing the structure of the 'orders' table. The table has columns: Table, Column, Data Type, Length, Precision, Scale, Primary Key, Nullable, Default, and Comment. The data rows show the following details:

| 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 environment interface. At the top, there are controls for Language (SQL), Rows (10), and buttons for Clear Command and Find Tables. Below this is a command input area with a refresh icon, a search icon, and a command prompt icon, followed by the command: 1 ALTER TABLE orders 2 MODIFY odr_date DATE DEFAULT SYSDATE;. The results are displayed in a table with tabs for Results, Explain, Describe, Saved SQL, and History. The Results tab is active, showing the message: Table altered. Below this, the execution time is shown as 0.06 seconds.

| Results | Explain | Describe | Saved SQL | History |
|----------------|---------|----------|-----------|---------|
| Table altered. | | | | |
| 0.06 seconds | | | | |

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

The screenshot shows the SQL Developer interface with the command `DESCRIBE orders` entered in the SQL window. The interface includes a top bar with 'Language' set to 'SQL', 'Rows' set to '10', and buttons for 'Clear Command' and 'Find Tables'. Below the command window, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Describe' tab is active, displaying the structure of the 'ORDERS' table. The table has 10 columns: Table, Column, Data Type, Length, Precision, Scale, Primary Key, Nullable, Default, and Comment. The data for the 'ORDERS' table is as follows:

| 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 SQL Developer interface with the command `DESCRIBE customers` entered in the SQL window. The interface includes a top bar with 'Language' set to 'SQL', 'Rows' set to '10', and buttons for 'Clear Command' and 'Find Tables'. Below the command window, there are tabs for 'Results', 'Explain', 'Describe', 'Saved SQL', and 'History'. The 'Describe' tab is active, displaying 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 data for the 'CUSTOMERS' table is as follows:

| 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 | - | - | - | ✓ | - | - |

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

Language: SQL ? Rows: 10 ? Clear Command Find Tables

1 ALTER TABLE customers
2 ADD CONSTRAINT check|current_balance
3 CHECK(current_balance >= 0);

Results Explain Describe Saved SQL History

Table altered.

0.04 seconds

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

Language: SQL ? Rows: 10 ? Clear Command Find Tables

1 DESCRIBE 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 | - | - | - | ✓ | - | - |

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.

| CUSTOMERS | | | | | | | | | |
|--|---------|-------------------------------|-------------------------------|---------------------|-------------|----------|--------------|--------------|----------------|
| Columns | Data | Indexes | Constraints | Grants | Statistics | Triggers | Dependencies | DDL | Sample Queries |
| + Create Drop Enable Disable Refresh | | | | | | | | | |
| Constraint | Type | Search Condition | Related Constraint | Columns | Delete Rule | Status | Last Change | Index | Invalid |
| CHECK_CURRENT_BALANCE | Check | current_balance >= 0 | | | | ENABLED | 12/16/2023 | | |
| SYS_C0005792851 | Check | "CTR_NUMBER" IS NOT NULL | | | | ENABLED | 12/16/2023 | | |
| SYS_C0005792852 | Check | "EMAIL" IS NOT NULL | | | | ENABLED | 12/16/2023 | | |
| SYS_C0005792853 | Check | "FIRST_NAME" IS NOT NULL | | | | ENABLED | 12/16/2023 | | |
| SYS_C0005792854 | Check | "LAST_NAME" IS NOT NULL | | | | ENABLED | 12/16/2023 | | |
| SYS_C0005792855 | Check | "PHONE_NUMBER" IS NOT NULL | | | | ENABLED | 12/16/2023 | | |
| SYS_C0005792856 | Check | "CURRENT_BALANCE" IS NOT NULL | | | | ENABLED | 12/16/2023 | | |
| CUSTOMER_SALES_REP_FK | Foreign | | SALES_REPRESENTATIVE_PK (...) | SRE_ID | NO ACTION | ENABLED | 12/16/2023 | | |
| CUSTOMER_TEAM_FK | Foreign | | TEAM_PK (WSP_KESSEIDATAB... | TEM_ID | NO ACTION | ENABLED | 12/16/2023 | | |
| CUSTOMER_PK | Primary | | | CTR_NUMBER | | ENABLED | 12/16/2023 | CUSTOMER_PK | |
| CTR_EMAIL_UK | Unique | | | EMAIL | | ENABLED | 12/16/2023 | CTR_EMAIL_UK | |
| CTR_LCN_UK | Unique | | | LOYALTY_CARD_NUMBER | | ENABLED | 12/16/2023 | 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.

LanguageSQLRows10Clear CommandFind Tables

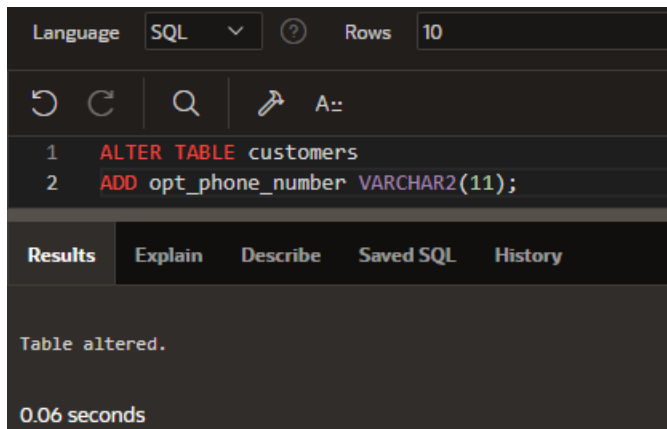
1DESCRIBEcustomers

ResultsExplainDescribeSaved SQLHistory

Object TypeTABLEObjectCUSTOMERS

| 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 | - | - | - | ✓ | - | - |

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



Language SQL Rows 10

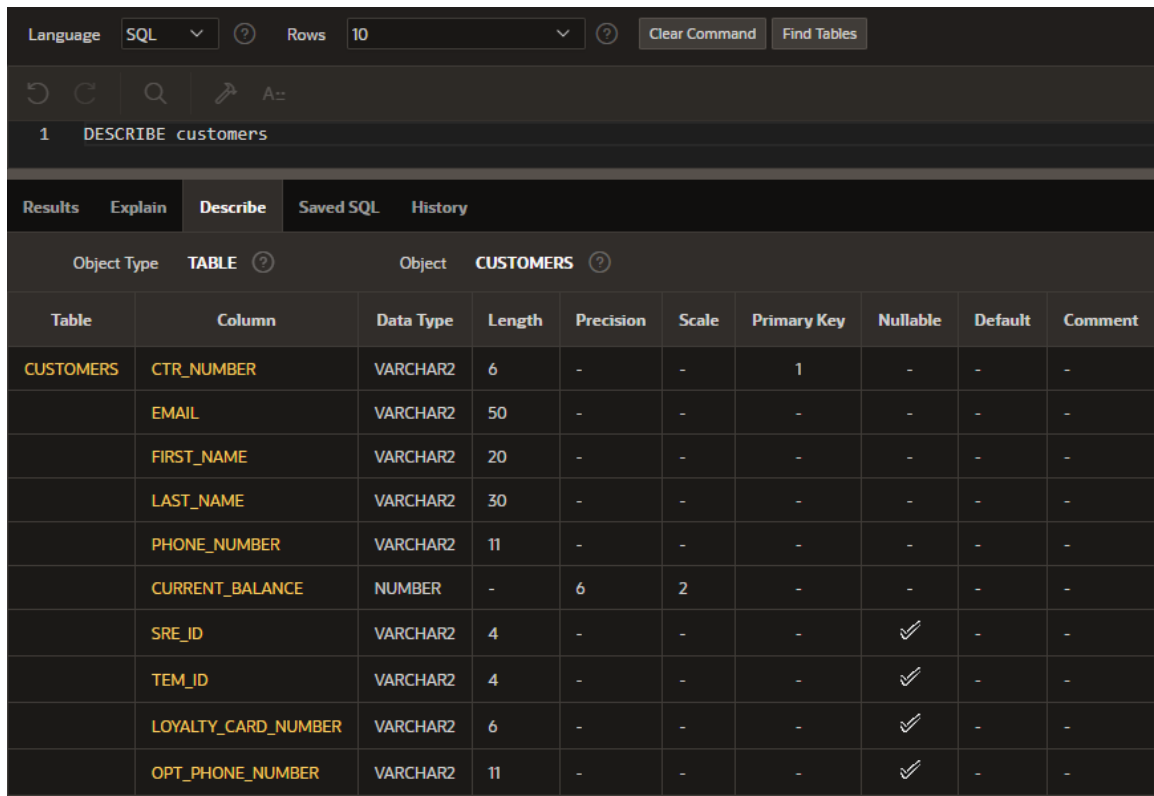
```
1 ALTER TABLE customers
2 ADD opt_phone_number VARCHAR2(11);
```

Results Explain Describe Saved SQL History

Table altered.

0.06 seconds

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



Language SQL Rows 10 Clear Command Find Tables

```
1 DESCRIBE customers
```

Results Explain Describe Saved SQL History

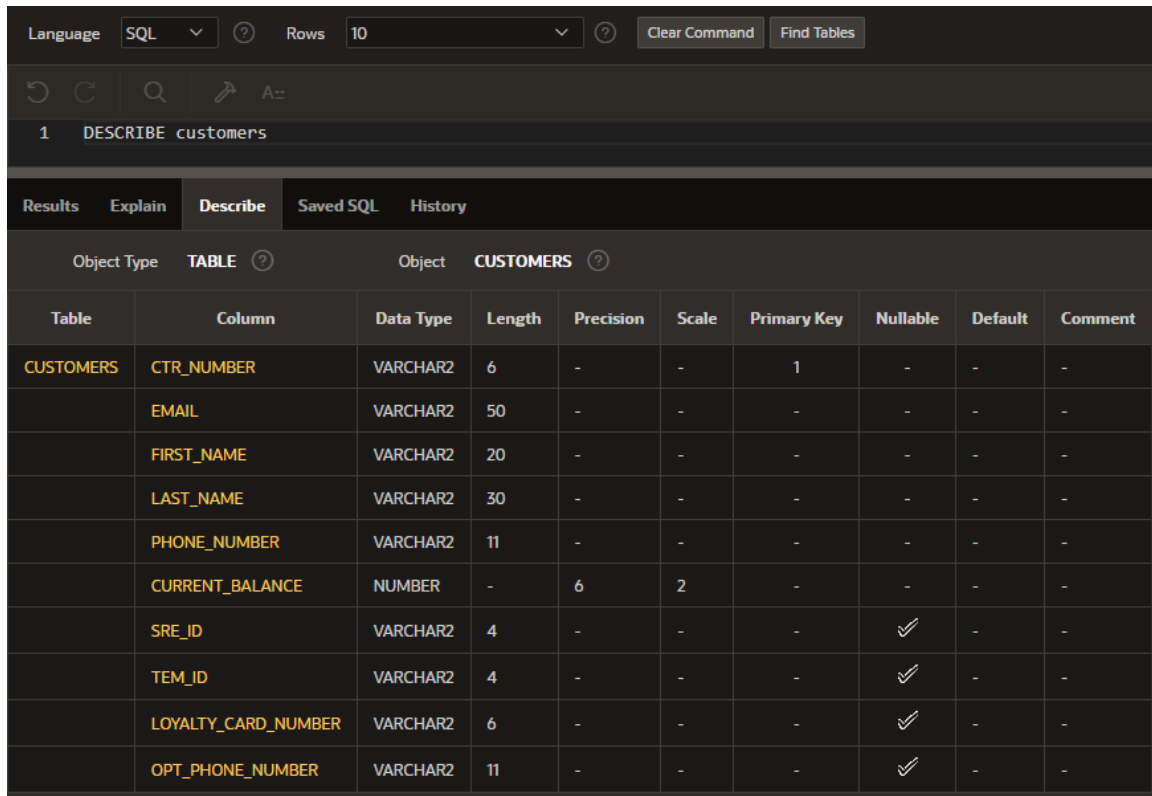
Object Type TABLE Object CUSTOMERS

| 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 | - | - | - | ✓ | - | - |
| | OPT_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.

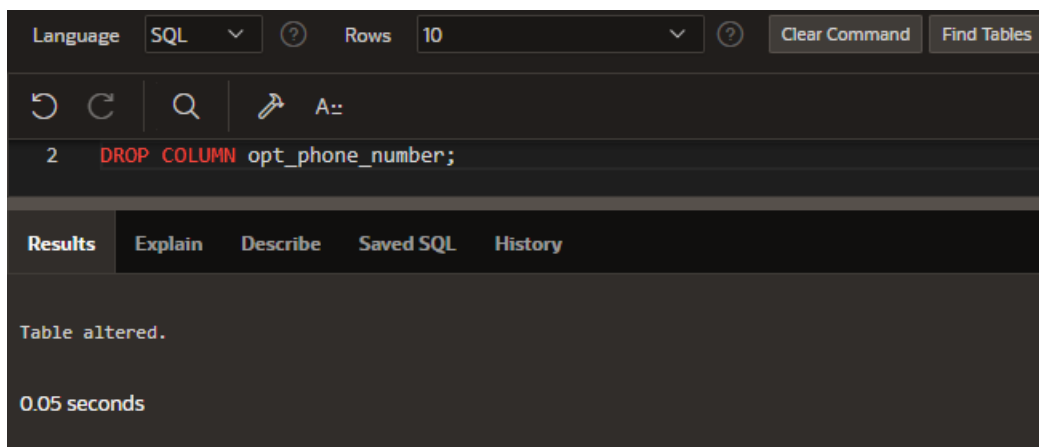
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows a database client interface with a dark theme. At the top, there's a header bar with 'Language' set to 'SQL', 'Rows' set to '10', and buttons for 'Clear Command' and 'Find Tables'. Below this is a toolbar with icons for refresh, undo, redo, search, and a text input field containing 'A:'. The main area shows the command '1 DESCRIBE customers' entered. Below the command bar, there are tabs for 'Results', 'Explain', 'Describe' (which is selected), 'Saved SQL', and 'History'. The 'Describe' tab displays the structure of the 'CUSTOMERS' table. It shows columns: CTR_NUMBER, EMAIL, FIRST_NAME, LAST_NAME, PHONE_NUMBER, CURRENT_BALANCE, SRE_ID, TEM_ID, LOYALTY_CARD_NUMBER, and OPT_PHONE_NUMBER. Each column has its data type, length, precision, scale, primary key status, nullable status, default value, and comment.

| 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 | - | - | - | ✓ | - | - |
| | OPT_PHONE_NUMBER | VARCHAR2 | 11 | - | - | - | ✓ | - | - |

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



The screenshot shows the same database client interface. The command bar now shows '2 DROP COLUMN opt_phone_number;'. The 'Results' tab is selected, and it displays the message 'Table altered.' followed by the execution time '0.05 seconds'.

| Results | Explain | Describe | Saved SQL | History |
|----------------|---------|----------|-----------|---------|
| Table altered. | | | | |
| 0.05 seconds | | | | |

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

LanguageSQLRows10

Clear CommandFind Tables

1DESCRIBE customers

ResultsExplainDescribeSaved SQLHistory

Object TypeTABLEObjectCUSTOMERS

| 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 | - | - | - | ✓✓ | - | - |