

Database Design Project

Oracle Baseball League Store Database

Project Scenario:

You are a small consulting company specializing in database development. You have just been awarded the contract to develop a data model for a database application system for a small retail store called Oracle Baseball League (OBL).

The Oracle Baseball League store serves the entire surrounding community selling baseball kit. The OBL has two types of customer, there are individuals who purchase items like balls, cleats, gloves, shirts, screen printed t-shirts, and shorts. Additionally customers can represent a team when they purchase uniforms and equipment on behalf of the team.

Teams and individual customers are free to purchase any item from the inventory list, but teams get a discount on the list price depending on the number of players. When a customer places an order we record the order items for that order in our database.

OBL has a team of three sales representatives that officially only call on teams but have been known to handle individual customer complaints.

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

App Builder
SQL Workshop
Team Development
Gallery

SK

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↑
SQL Commands

Schema
WKSP_LAB

Language
SQL
Rows
10
Clear Command
Find Tables

Save
Run

A++

1
DESCRIBE orders

Results
Explain
Describe
Saved SQL
History

Object Type
TABLE
Object
ORDERS

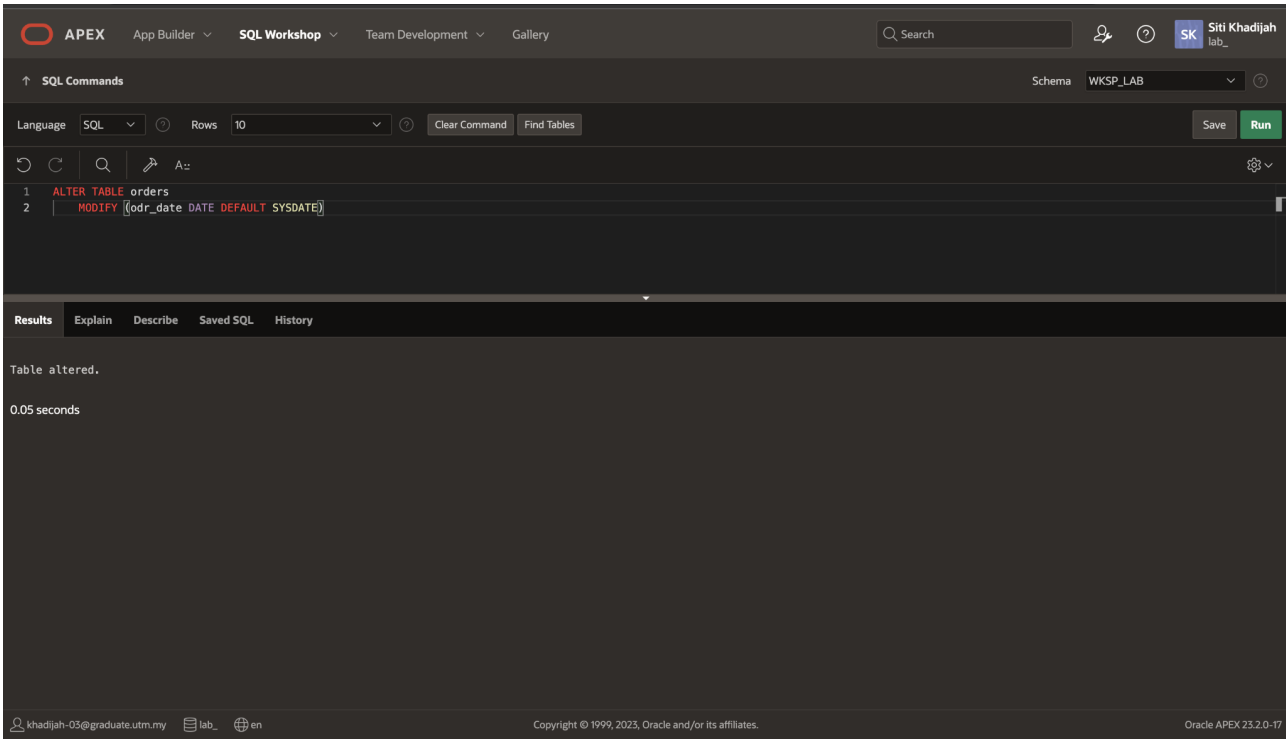
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
ORDERS	ID	VARCHAR2	9	-	-	1	-	-	-
	ODR_DATE	DATE	7	-	-	-	-	-	-
	ODR_TIME	DATE	7	-	-	-	-	-	-
	NUMBER_OF_UNITS	NUMBER	-	2	0	-	-	-	-
	CTR_NUMBER	VARCHAR2	6	-	-	-	-	-	-

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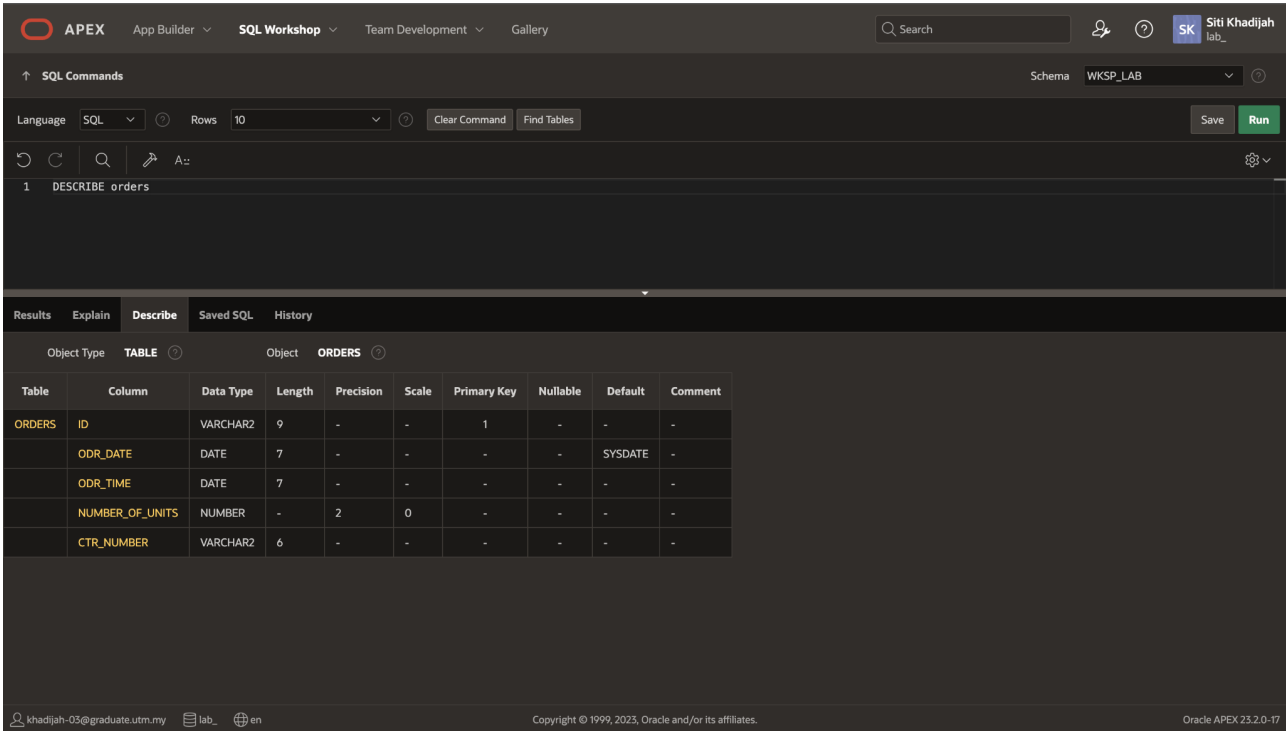
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2. **Task:** Add a default constraint that will use today's date to assign a value to the odr_date column of the orders table if no date is provided.

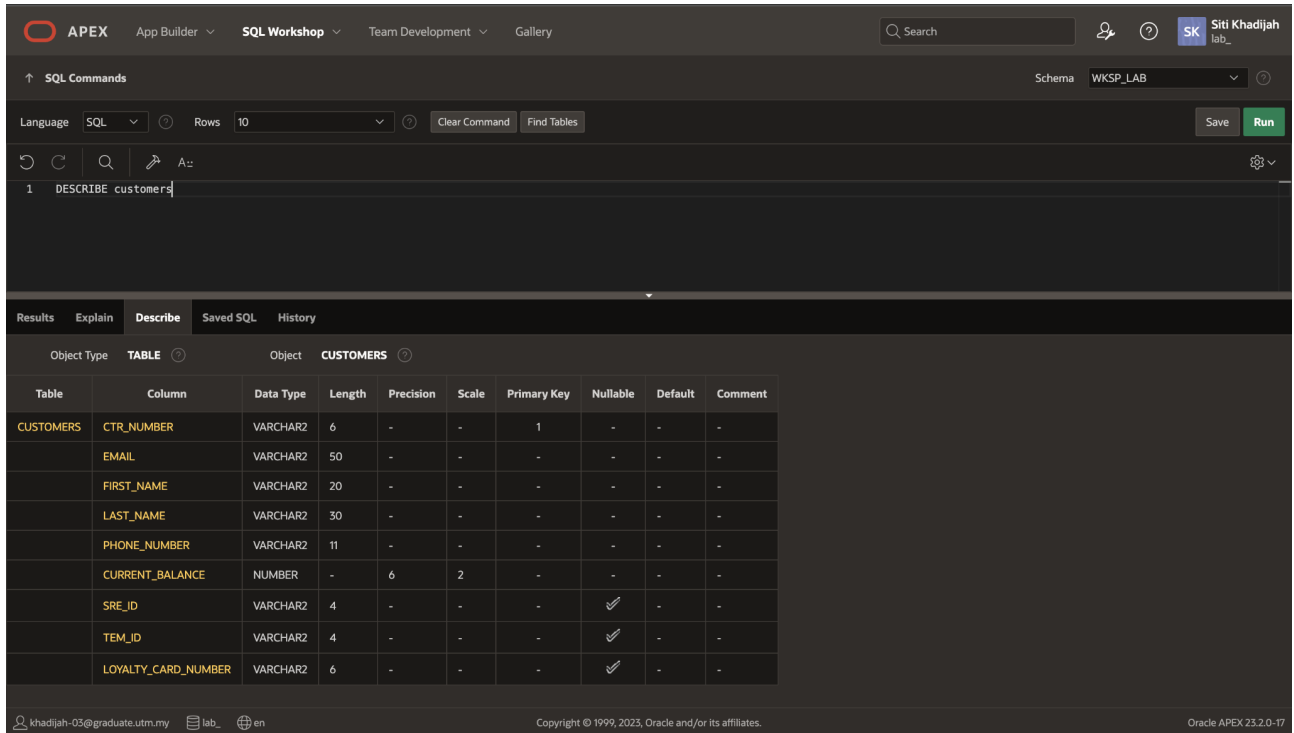


3. Run the DESCRIBE command again to verify the command was successful.



Adding a check constraint

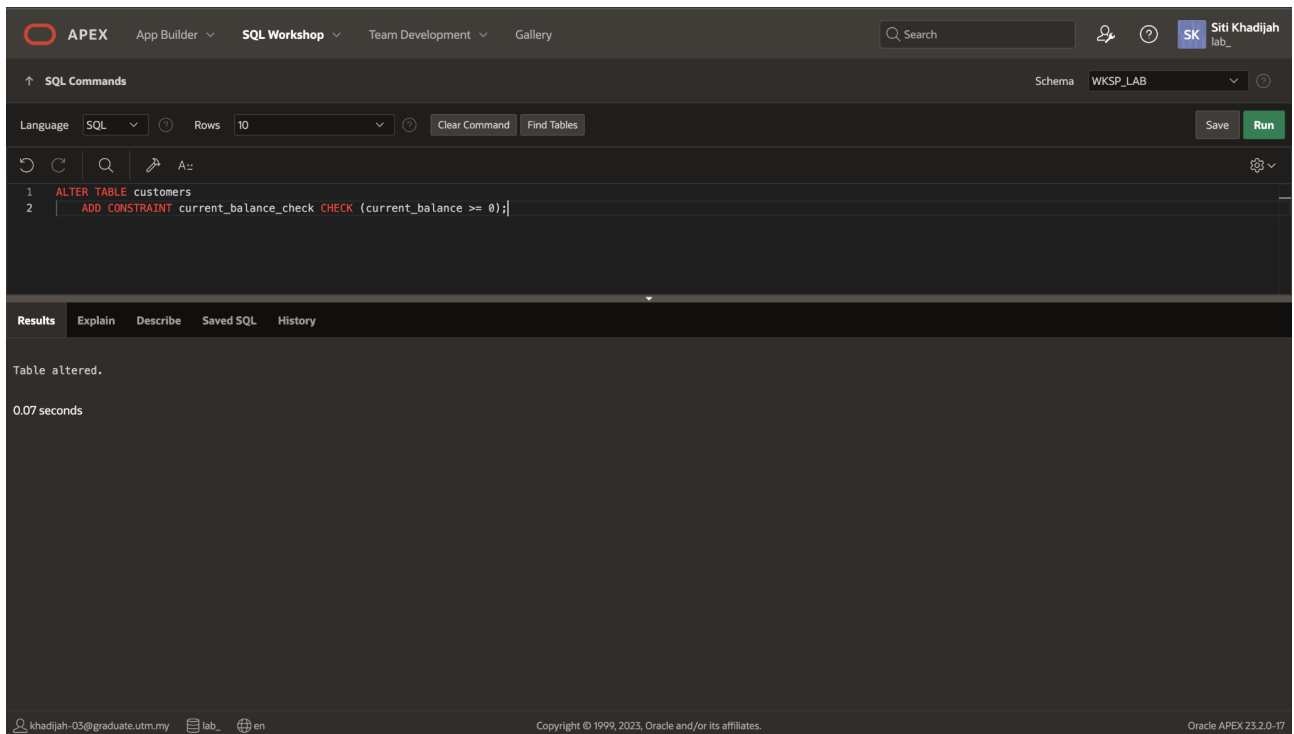
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, and the command `DESCRIBE customers` has been executed. The Results 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 `CURRENT_BALANCE` column is of type `NUMBER` with a precision of 6 and a scale of 2. The `SRE_ID`, `TEM_ID`, and `LOYALTY_CARD_NUMBER` columns are of type `VARCHAR2` with lengths of 4, 4, and 6 respectively. The `CURRENT_BALANCE` column has a check constraint.

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, and the command `ALTER TABLE customers ADD CONSTRAINT current_balance_check CHECK (current_balance >= 0);` has been executed. The Results tab is selected, displaying the message "Table altered." and the execution time "0.07 seconds".

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

Table altered.
0.07 seconds

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

APEX App Builder SQL Workshop Team Development Gallery

Search

SQL Commands Schema WKSP_LAB

Language SQL Rows 10 Clear Command Find Tables Save Run

```
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	-	-	-	✓	-	-

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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.

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 'Siti Khadijah lab.' are on the right. The left sidebar shows the 'Object Browser' with a tree view containing 'Tables', 'ORDERS', 'Views', 'Indexes', 'Sequences', 'Types', 'Packages', 'Procedures', 'Functions', 'Triggers', 'Database Links', 'Materialized Views', 'Synonyms', and 'SODA Collections'. The 'CUSTOMERS' table is selected under 'Tables'. The main panel displays the 'CUSTOMERS' table with tabs for 'Columns', 'Data', 'Indexes', 'Constraints', 'Grants', 'Statistics', 'Triggers', 'Dependencies', 'DDL', and 'Sample Queries'. The 'Constraints' tab is active, showing a table of constraints for the 'CUSTOMERS' table. The table has columns: 'Constraint', 'Type', 'Search Condition', 'Related Constraint', 'Columns', and 'Delete Rule'. The constraints listed are: 'CURRENT_BALANCE_CHECK' (Check, current_balance >= 0), 'SYS_C00148966790' (Check, 'CTR_NUMBER' IS NOT NULL), 'SYS_C00148966791' (Check, 'EMAIL' IS NOT NULL), 'SYS_C00148966792' (Check, 'FIRST_NAME' IS NOT NULL), 'SYS_C00148966793' (Check, 'LAST_NAME' IS NOT NULL), 'SYS_C00148966794' (Check, 'PHONE_NUMBER' IS NOT NULL), 'SYS_C00148966795' (Check, 'CURRENT_BALANCE' IS NOT NULL), 'CUSTOMER_PK' (Primary, CTR_NUMBER), 'CTR_EMAIL_UK' (Unique, EMAIL), and 'CTR_LCN_UK' (Unique, LOYALTY_CARD_NUMBER). The bottom status bar shows '1 cells selected' and '1 - 10 of 10'.

Constraint	Type	Search Condition	Related Constraint	Columns	Delete Rule
CURRENT_BALANCE_CHECK	Check	current_balance >= 0			
SYS_C00148966790	Check	"CTR_NUMBER" IS NOT NULL			
SYS_C00148966791	Check	"EMAIL" IS NOT NULL			
SYS_C00148966792	Check	"FIRST_NAME" IS NOT NULL			
SYS_C00148966793	Check	"LAST_NAME" IS NOT NULL			
SYS_C00148966794	Check	"PHONE_NUMBER" IS NOT NULL			
SYS_C00148966795	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.

APEX

App Builder

SQL Workshop

Team Development

Gallery

Search

SK

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SQL Commands

Schema WKSP_LAB

Language SQL

Rows 10

Clear Command

Find Tables

Save

Run

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	-	-	-	✓	-	-

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

APEX App Builder SQL Workshop Team Development Gallery

Search

Schema WKSP_LAB

Language SQL Rows 10 Clear Command Find Tables Save Run

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

Results Explain Describe Saved SQL History

Table altered.

0.07 seconds

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

APEX App Builder SQL Workshop Team Development Gallery

Search

Schema WKSP_LAB

Language SQL Rows 10 Clear Command Find Tables Save Run

```
1 DESCRIBE customers
```

Results Explain Describe Saved SQL History

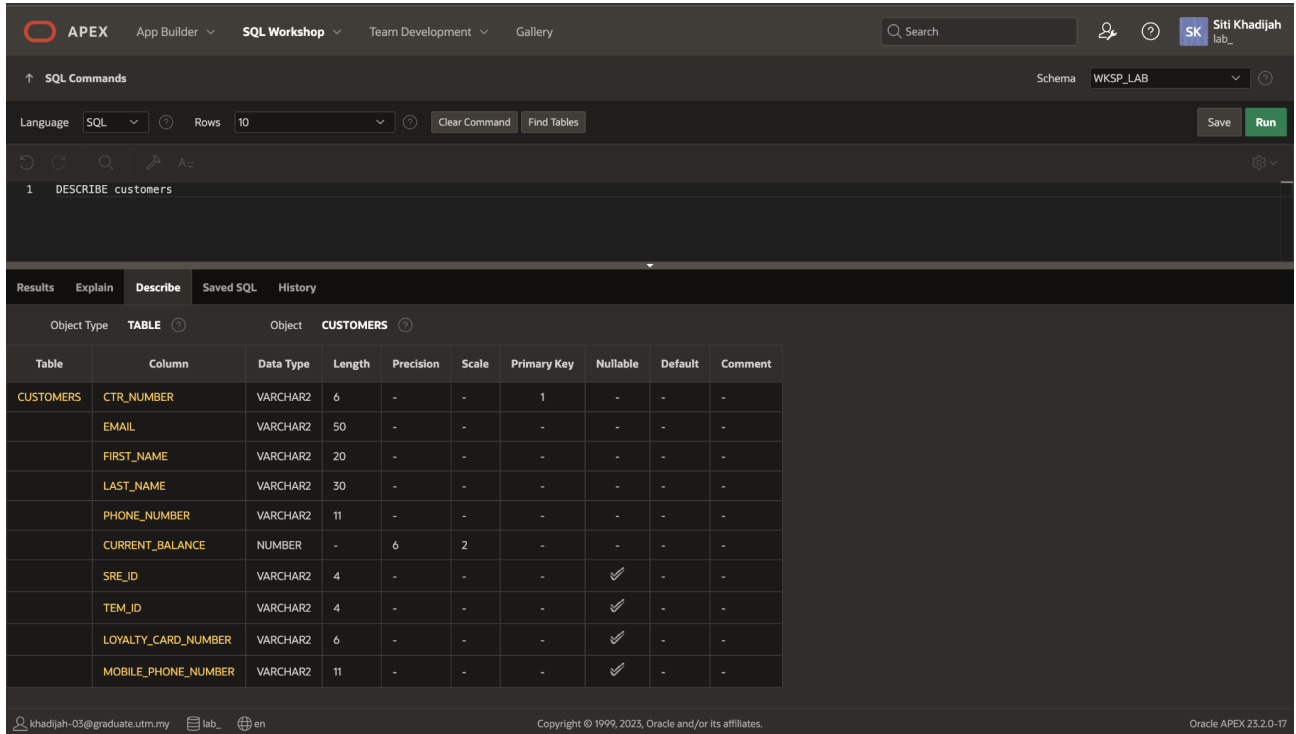
Object Type	TABLE	Object	CUSTOMERS						
Table	Column	Data Type	Length	Precision	Scale	Primary Key	Nullable	Default	Comment
CUSTOMERS	CTR_NUMBER	VARCHAR2	6	-	-	1	-	-	-
	EMAIL	VARCHAR2	50	-	-	-	-	-	-
	FIRST_NAME	VARCHAR2	20	-	-	-	-	-	-
	LAST_NAME	VARCHAR2	30	-	-	-	-	-	-
	PHONE_NUMBER	VARCHAR2	11	-	-	-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

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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.

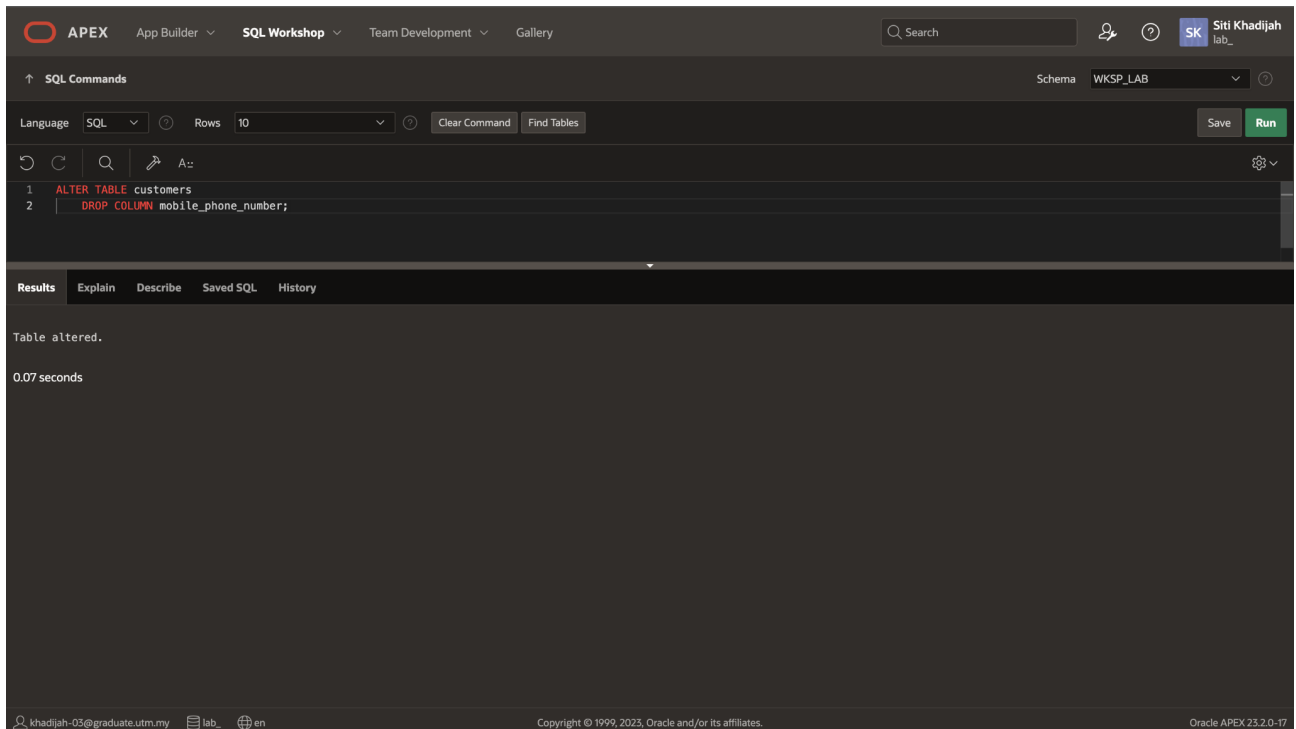
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, displaying the command `DESCRIBE customers`. The Results tab is selected, 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_PHONE_NUMBER`. The `CTR_NUMBER` column is the primary key. 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	-	-	-	✓	-	-

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



The screenshot shows the APEX SQL Workshop interface. The SQL Commands tab is active, displaying the command `ALTER TABLE customers DROP COLUMN mobile_phone_number;`. The Results tab is selected, showing the message "Table altered." and the execution time "0.07 seconds".

```
1 ALTER TABLE customers
2 DROP COLUMN mobile_phone_number;
```

Table altered.
0.07 seconds

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

The screenshot shows the Oracle APEX SQL Workshop interface. At the top, there's a navigation bar with 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'Siti Khadijah lab_...' are on the right. Below the navigation bar, the 'SQL Commands' section is active, showing a schema dropdown set to 'WKSP_LAB'. The command 'DESCRIBE customers' is entered in the SQL editor. The 'Run' button is highlighted in green. Below the editor, the 'Results' tab is selected, displaying 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	-	-	-	✓	-	-

At the bottom of the interface, there's a footer with the user 'khadijah-03@graduate.utm.my', a language selector set to 'en', and copyright information: 'Copyright © 1999, 2023, Oracle and/or its affiliates. Oracle APEX 23.2.0-17'.