



# UTM

UNIVERSITI TEKNOLOGI MALAYSIA

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**SECD2523 - DATABASE**

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**SQL1 - DDL**

**2023/2024**

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SUBMISSION DATE: 5/11/2023

## 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.

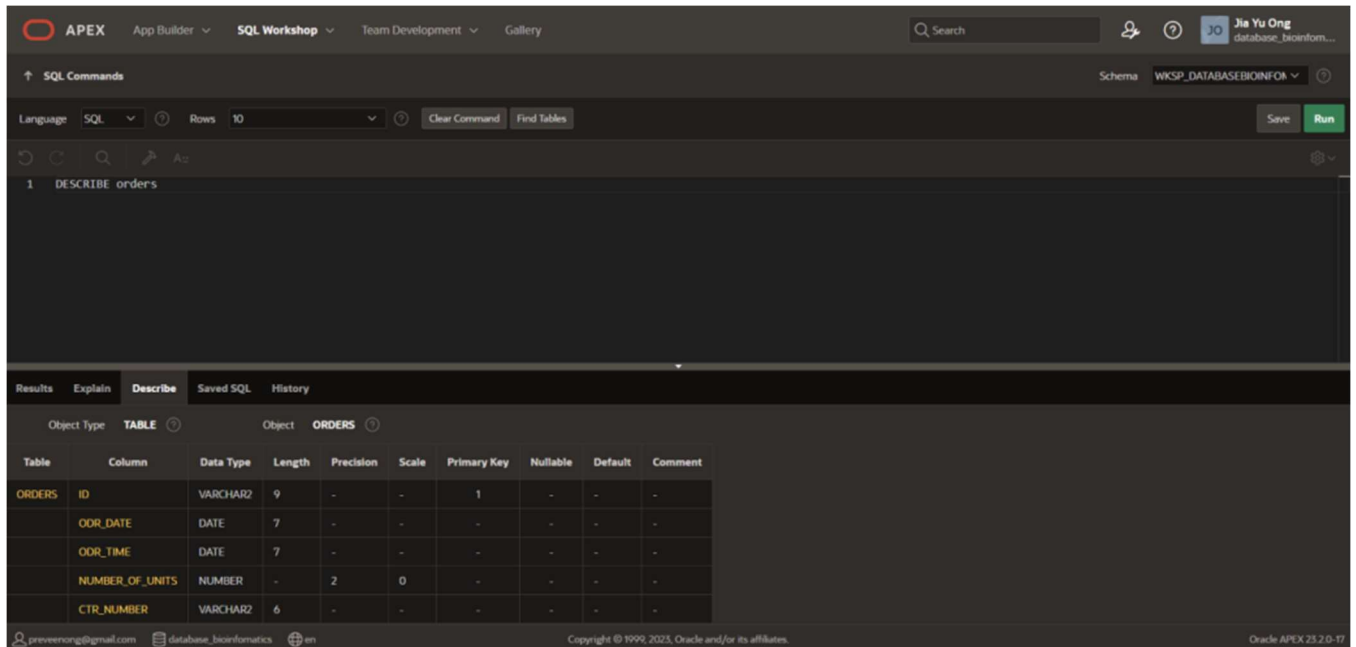
1. How many tables have been created using the CREATE TABLE statement?  
10 tables
2. How many columns are created for the price history table?  
6 columns
3. What statement is used to enforce the constraint that the category column of the items table must have a value?  
NOT NULL
4. What is the name 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

## Part 2 : Updating Constraints

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

### Modifying a column

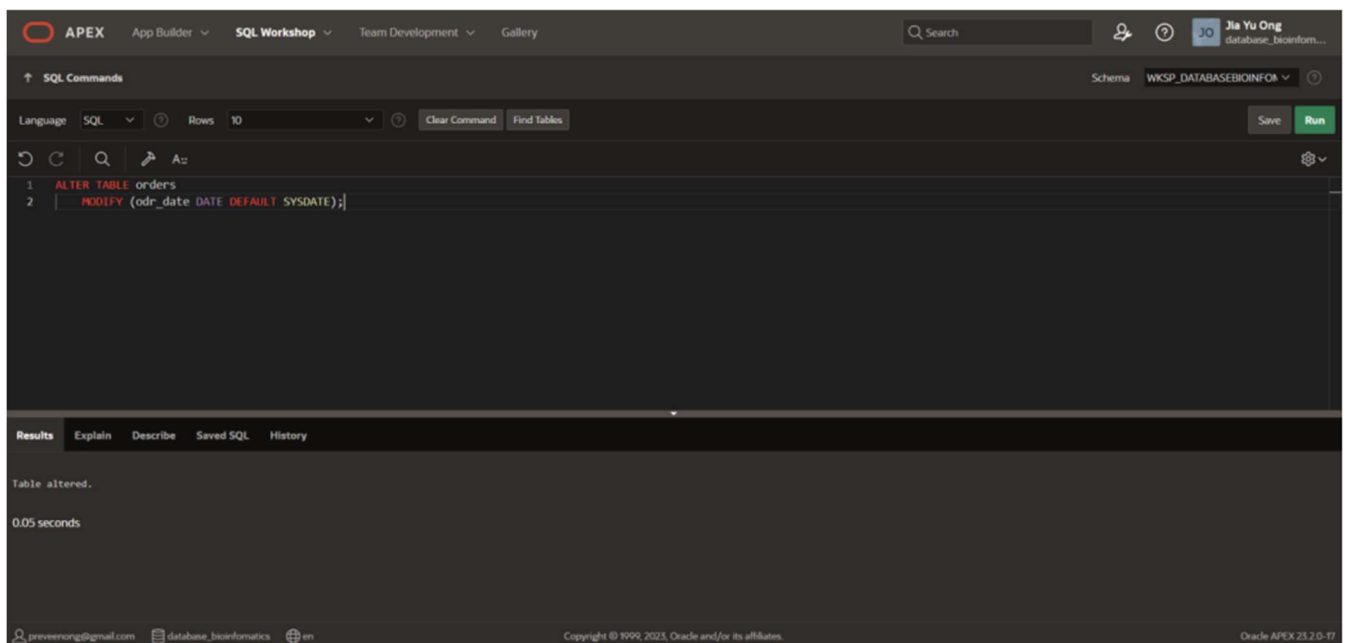
1. Run the DESCRIBE command on the orders table to view its structure.



The screenshot shows the APEX SQL Workshop interface. The 'SQL Commands' tab is active, and the 'DESCRIBE orders' command 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
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' tab is active, and the 'ALTER TABLE orders MODIFY (odr\_date DATE DEFAULT SYSDATE);' command 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
ORDERS	ID	VARCHAR2	9	-	-	1	-	-	-
	ODR_DATE	DATE	7	-	-	-	-	-	-
	ODR_TIME	DATE	7	-	-	-	-	-	-
	NUMBER_OF_UNITS	NUMBER	-	2	0	-	-	-	-
	CTR_NUMBER	VARCHAR2	6	-	-	-	-	-	-

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

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 'Jia Yu Ong' are on the right. The 'SQL Commands' section shows a command: `1 DESCRIBE orders;`. The 'Results' tab is active, displaying the structure of the **ORDERS** table.

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

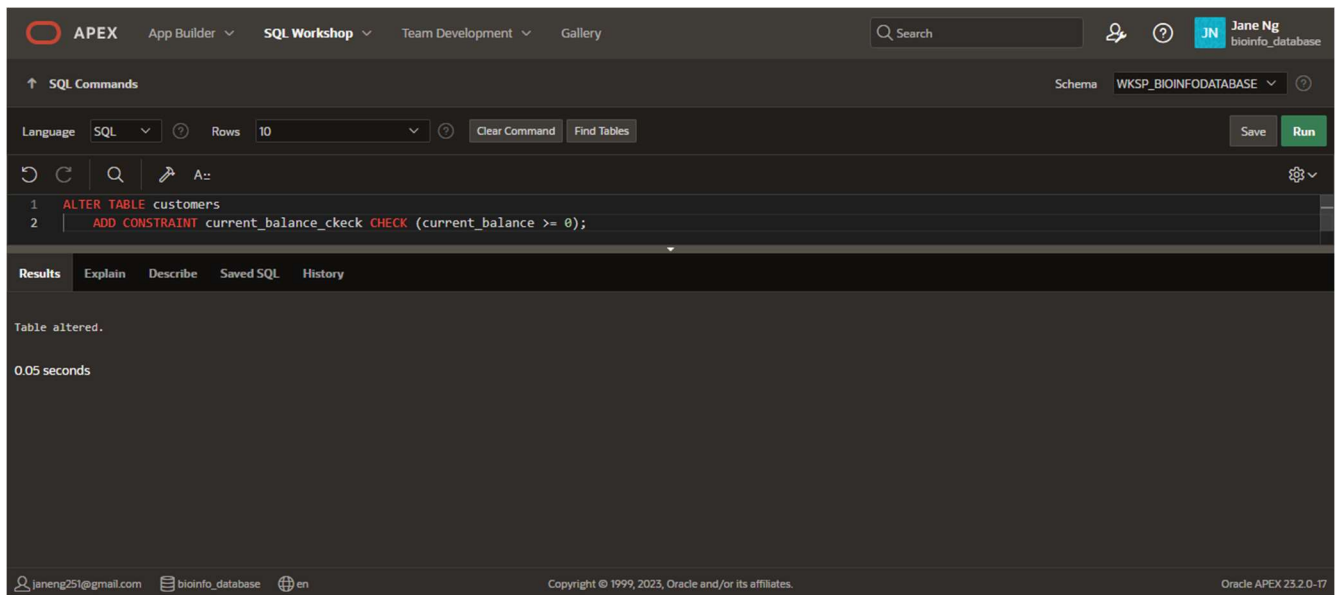
## Adding a check constraint

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

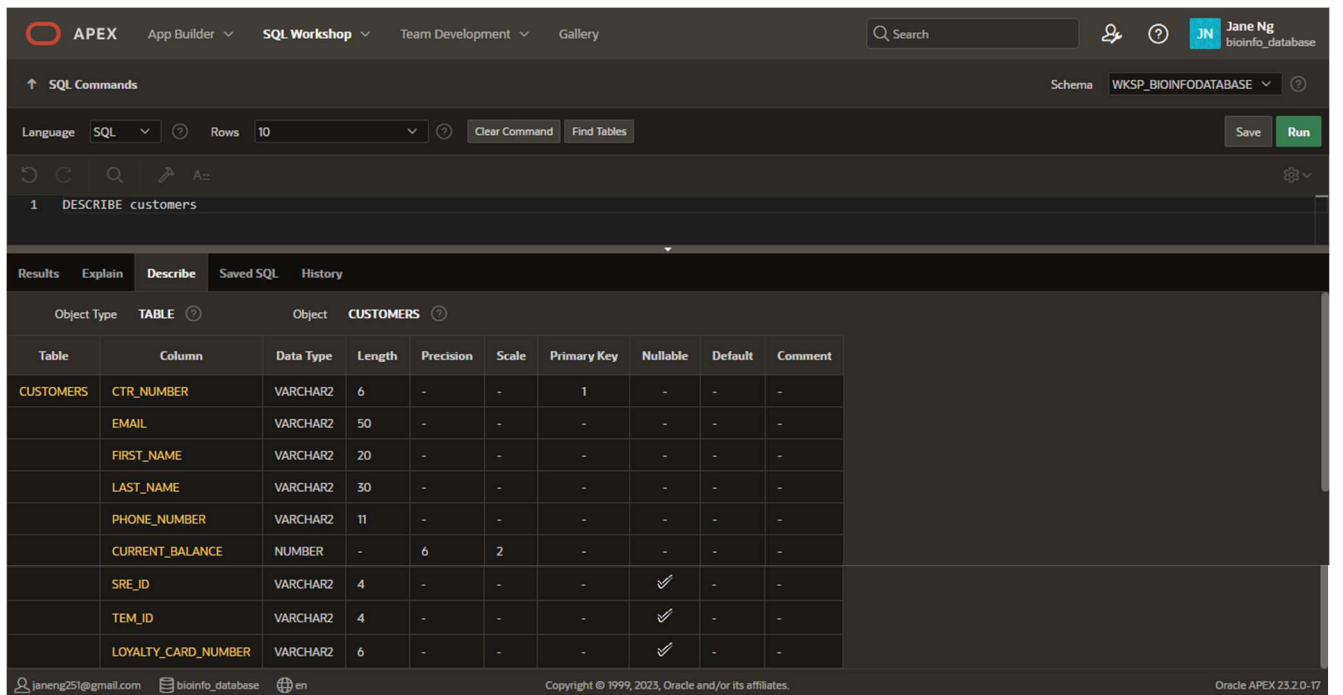
The screenshot shows the Oracle APEX SQL Workshop interface. The top navigation bar includes 'APEX', 'App Builder', 'SQL Workshop', 'Team Development', and 'Gallery'. A search bar and user profile 'Jane Ng' are on the right. The 'SQL Commands' section shows a command: `1 DESCRIBE customers`. The 'Results' 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	-	-	-	✓	-	-	

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.
- Go to the Object Browser
  - Select the customers table.
  - Click on the CONSTRAINTS tab.
  - You will see your constraint here.

**Object Browser**

Search: Type to filter...

**Tables**

- CUSTOMERS
- CUSTOMERS\_ADDRESSES
- INVENTORY\_LIST
- ITEMS
- ORDERED\_ITEMS
- ORDERS
- PRICE\_HISTORY
- SALES\_REPRESENTATIVES
- SALES\_REP\_ADDRESSES
- TEAMS

**Views**

**Indexes**

**Sequences**

**Types**

**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
CURRENT_BALANCE_CKECK	Check	current_balance >= 0			
SYS_C00148803825	Check	"CTR_NUMBER" IS NOT NULL			
SYS_C00148803826	Check	"EMAIL" IS NOT NULL			
SYS_C00148803827	Check	"FIRST_NAME" IS NOT NULL			
SYS_C00148803828	Check	"LAST_NAME" IS NOT NULL			
SYS_C00148803829	Check	"PHONE_NUMBER" IS NOT NULL			
SYS_C00148803830	Check	"CURRENT_BALANCE" IS NOT NULL			
CUSTOMER_SALES_REP_FK	Foreign		SALES_REPRESENTATIVE_PK...	SRE_ID	NO AC

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.

**SQL Commands**

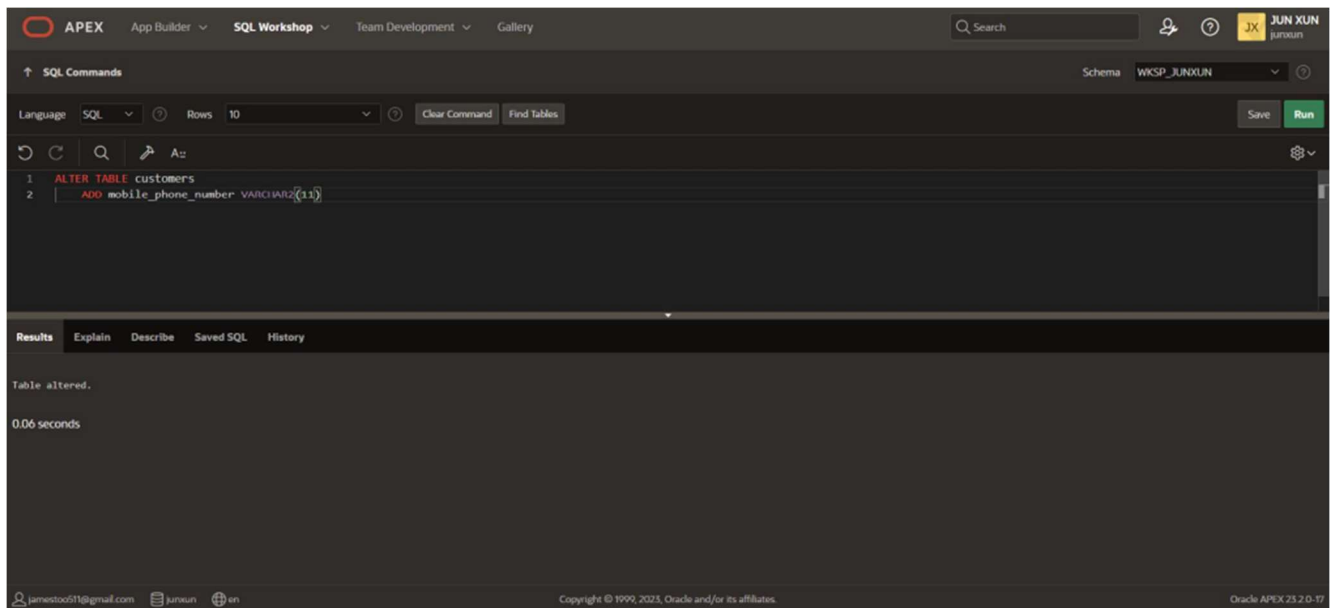
Language: SQL Rows: 10 Clear Command Find Tables Save Run

```
1 DESCRIBE customers
2
```

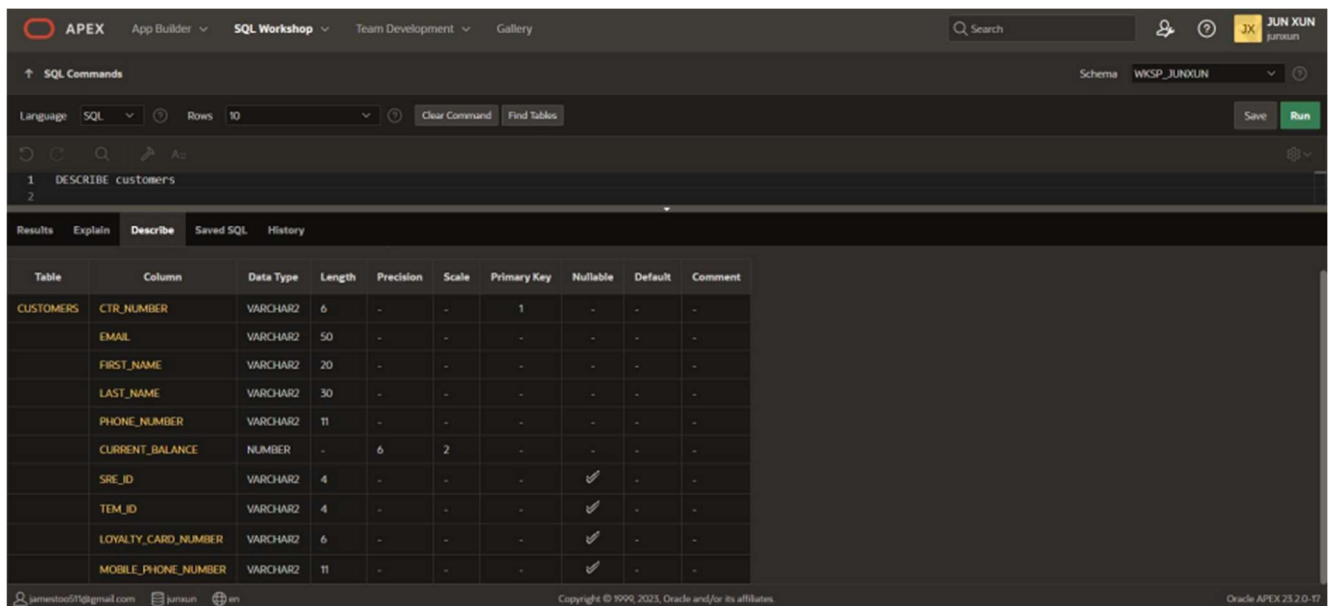
**Results** Explain **Describe** Saved SQL History

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



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

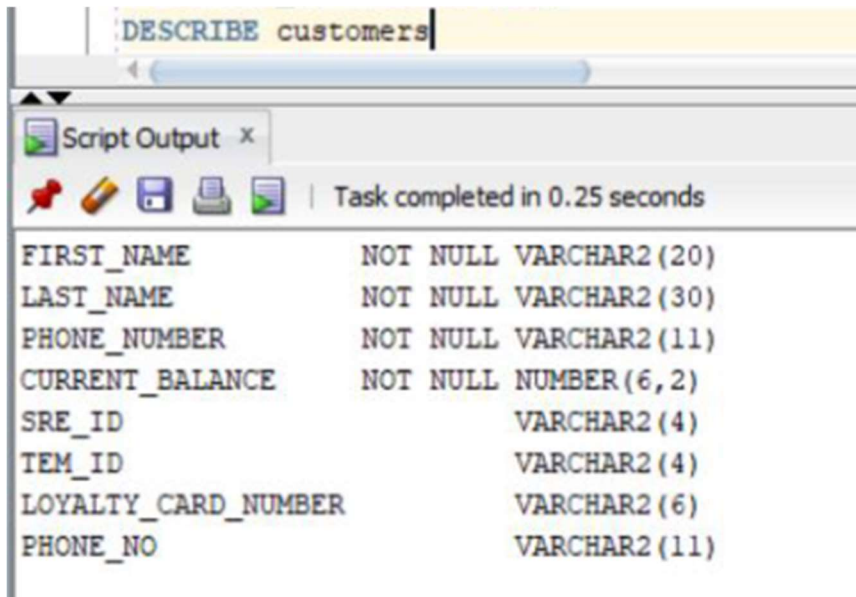




## Dropping a column

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.

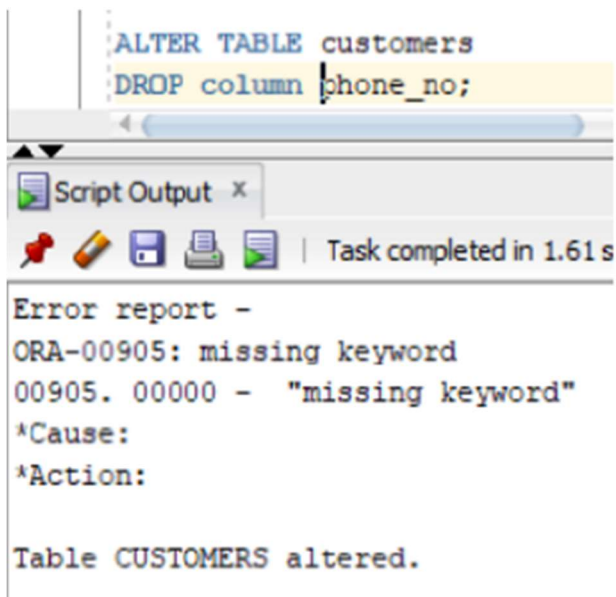
1. Run the DESCRIBE command on the customers table to view its structure.



The screenshot shows a SQL Developer window with the command `DESCRIBE customers` entered in the script editor. Below the editor, the 'Script Output' pane displays the table structure for the `CUSTOMERS` table. The output is as follows:

Column Name	Nullability	Data Type
FIRST_NAME	NOT NULL	VARCHAR2(20)
LAST_NAME	NOT NULL	VARCHAR2(30)
PHONE_NUMBER	NOT NULL	VARCHAR2(11)
CURRENT_BALANCE	NOT NULL	NUMBER(6,2)
SRE_ID		VARCHAR2(4)
TEM_ID		VARCHAR2(4)
LOYALTY_CARD_NUMBER		VARCHAR2(6)
PHONE_NO		VARCHAR2(11)

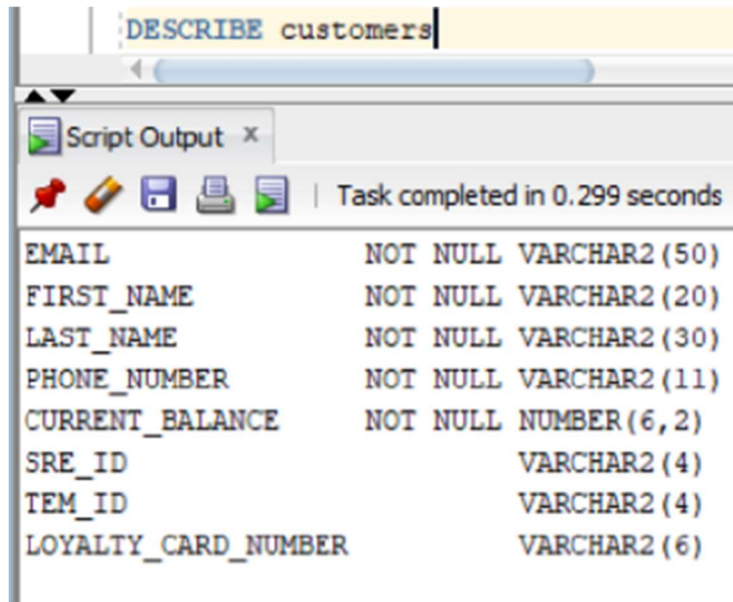
2. **Task:** Drop the column that was created to store the mobile phone number.



The screenshot shows a SQL Developer window with the command `ALTER TABLE customers DROP column phone_no;` entered in the script editor. Below the editor, the 'Script Output' pane displays the error report and the successful execution of the command.

```
Error report -  
ORA-00905: missing keyword  
00905. 00000 - "missing keyword"  
*Cause:  
*Action:  
  
Table CUSTOMERS altered.
```

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



The screenshot shows a SQL IDE interface. At the top, a text editor contains the command `DESCRIBE customers`. Below the editor is a 'Script Output' window. It features a toolbar with icons for a pin, a pencil, a save icon, a print icon, and a document icon. To the right of the toolbar, it says 'Task completed in 0.299 seconds'. The main area of the 'Script Output' window displays the following table structure:

EMAIL	NOT NULL VARCHAR2 (50)
FIRST_NAME	NOT NULL VARCHAR2 (20)
LAST_NAME	NOT NULL VARCHAR2 (30)
PHONE_NUMBER	NOT NULL VARCHAR2 (11)
CURRENT_BALANCE	NOT NULL NUMBER (6, 2)
SRE_ID	VARCHAR2 (4)
TEM_ID	VARCHAR2 (4)
LOYALTY_CARD_NUMBER	VARCHAR2 (6)