Lab 1: SQL1 Data Definition Language – Use DDL to build and maintain database tables

SECD2523 – 06 Database

Universiti Teknologi Malaysia

Objective:

1. To identify the steps needed to create database tables

2. To understand the purpose of data definition language (DDL)

3. To identify the DDL operations needed to build and maintain a database's table

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PART 1: Reading information from a script

In this part of exercise, we will use the "obl Sports.ddl" file to consolidate our 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 in total;

   - 'inventory_list'
   - 'items'
   - 'price_history'
   - 'sales_representatives'
   - 'sales_rep_addresses'
   - 'teams'
   - 'customers'
   - 'customers_addresses'
   - 'orders'
   - 'ordered_items'

2. How many columns are created for the price history table?

   6 columns are created for the price_history table which is;

   - 'start_date'
   - 'start_time'
   - 'price'
   - 'end_date'
   - 'end'
   - 'itm_number'

3. What statement is used to enforce the constraint that the category column of the items table must have a value?

   The **'NOT NULL'** statement in the 'VARCHAR(25) NOT NULL' line is used to enforce the constraint that the 'category' column of the 'items' table must have value.

4. What is the name of the foreign key constraint between the customers and customer addresses tables?
   - 'ctr_number' is the column that serves as the foreign key between these two tables.
   - On the other hand, **'customer_address_customer_fk'** is the name given as the foreign key constraint.

5. What are the lowest and highest values that can be stored in the commission_rate column for the sales_representatives table?
   The 'NUMBER(2)' statement defined in the table indicates that lowest and highest values that can be stored in the 'commission_rate' column for the 'sales_representatives' table is ranging from **-99 to 99.**

6. What are the lowest and highest values that can be stored in the price column for the price_history table?
   The 'NUMBER(7,2)' statement defined in the table indicates that the lowest and highest values that can be stored in the 'price' column for the 'price_history' table is ranging from **-9999999.99 to 9999999.99**

7. What are the 3 columns that make up the primary key for the price_history table?
   The 3 columns that make up the primary key for the 'price_history' table includes;
   - 'itm_number'
   - 'start_date'
   - 'start_time'

Part 2: Updating Constraint

In this part of exercise, we are going to learn about how to build and maintain the database's tables.

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

Modifying a column

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

```
1  DESCRIBE orders;
```

TABLE ORDERS

Column	Null?	Type
ID	NOT NULL	VARCHAR2(9)
ODR_DATE	NOT NULL	DATE
ODR_TIME	NOT NULL	DATE
NUMBER_OF_UNITS	NOT NULL	NUMBER(2,0)
CTR_NUMBER	NOT NULL	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.

```
1  ALTER TABLE orders
2  MODIFY odr_date DATE DEFAULT SYSDATE;
3
```

```
Table altered.
```

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

```
1  DESCRIBE orders;
```

TABLE ORDERS

Column	Null?	Type
ID	NOT NULL	VARCHAR2(9)
ODR_DATE	NOT NULL	DATE
ODR_TIME	NOT NULL	DATE
NUMBER_OF_UNITS	NOT NULL	NUMBER(2,0)
CTR_NUMBER	NOT NULL	VARCHAR2(6)

Adding a check constraint

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

Column	Null?	Type
CTR_NUMBER	NOT NULL	VARCHAR2(6)
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)

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

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

```
Table altered.
```

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

Column	Null?	Type
CTR_NUMBER	NOT NULL	VARCHAR2(6)
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)

4. A check constraint is not shown in the results of a describe command.

a. Go to the Object Browser

b. Select the customer's table.

c. Click on the CONSTRAINTS tab.

d. You will see your constraint here.

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.

Column	Null?	Type
CTR_NUMBER	NOT NULL	VARCHAR2(6)
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)

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

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

```
Table altered.
```

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

Column	Type	Length	Precision	Scale	Nullable
CTR_NUMBER	VARCHAR2	6			No
EMAIL	VARCHAR2	50			No
FIRST_NAME	VARCHAR2	20			No
LAST_NAME	VARCHAR2	30			No
PHONE_NUMBER	VARCHAR2	11			No
CURRENT_BALANCE	NUMBER	22	6	2	No
SRE_ID	VARCHAR2	4			Yes
TEM_ID	VARCHAR2	4			Yes
LOYALTY_CARD_NUMBER	VARCHAR2	6			Yes
MOBILE_NUMBER	VARCHAR2	11			Yes

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.

Column	Type	Length	Precision	Scale	Nullable
CTR_NUMBER	VARCHAR2	6			No
EMAIL	VARCHAR2	50			No
FIRST_NAME	VARCHAR2	20			No
LAST_NAME	VARCHAR2	30			No
PHONE_NUMBER	VARCHAR2	11			No
CURRENT_BALANCE	NUMBER	22	6	2	No
SRE_ID	VARCHAR2	4			Yes
TEM_ID	VARCHAR2	4			Yes
LOYALTY_CARD_NUMBER	VARCHAR2	6			Yes
MOBILE_NUMBER	VARCHAR2	11			Yes

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

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

```
Table altered.
```

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

Table **CUSTOMERS**

Column	Type	Length	Precision	Scale	Nullable
CTR_NUMBER	VARCHAR2	6			No
EMAIL	VARCHAR2	50			No
FIRST_NAME	VARCHAR2	20			No
LAST_NAME	VARCHAR2	30			No
PHONE_NUMBER	VARCHAR2	11			No
CURRENT_BALANCE	NUMBER	22	6	2	No
SRE_ID	VARCHAR2	4			Yes
TEM_ID	VARCHAR2	4			Yes
LOYALTY_CARD_NUMBER	VARCHAR2	6			Yes