
Faculty of Computing

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SECD2523-08 : DATABASE

# Lab 2: DML 1

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Prepared by:


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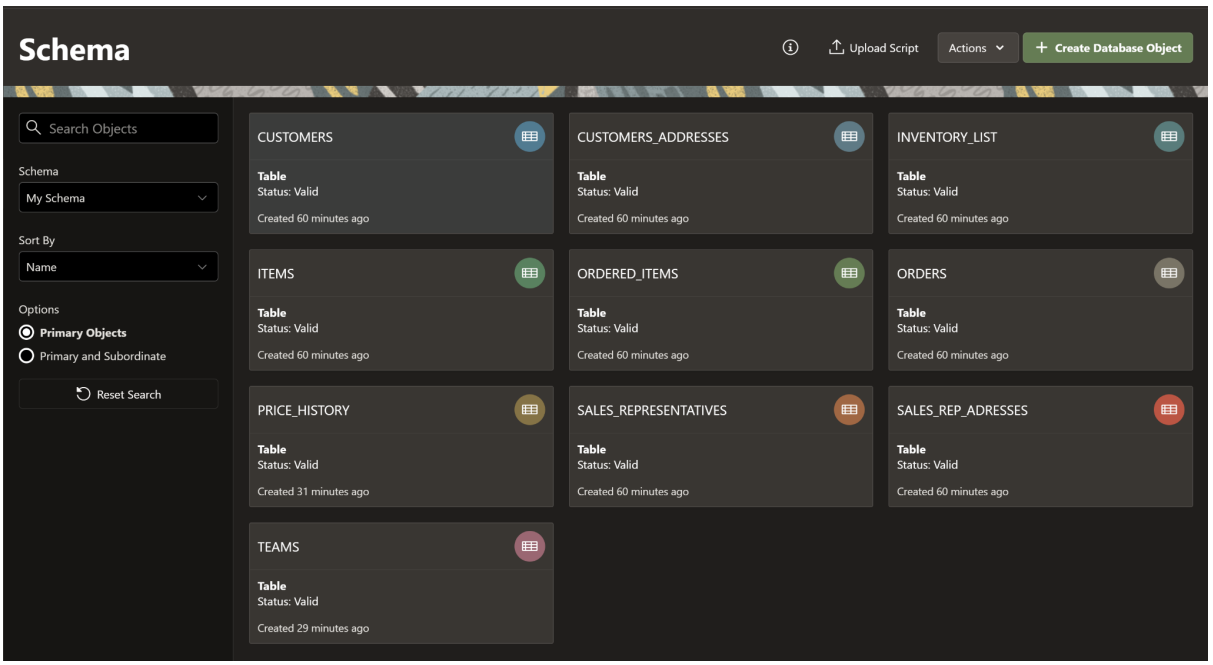
**Section 6 Lesson 4 Exercise 1: Data Manipulation Language**

**Part 1 : Running a script to populate the tables. You have to consider the order of the tables when populating them.**

1. Use the table mapping document and list the order that you would use to populate the tables.
    - Customers
    - Items
    - Customers_Addresses
    - Inventory_List
    - Items
    - Ordered_Items
    - Orders
    - Price_History
    - Sales_Representatives
    - Sales_Rep_Adresses
    - Teams



Statement 1

```
CREATE TABLE inventory_list (
    id VARCHAR2(11) NOT NULL,
    cost NUMBER(7,2) NOT NULL,
    units NUMBER(4) NOT NULL,
    CONSTRAINT inventory_list_pk PRIMARY KEY (id)
)
```

Table created.

Statement 2

```
CREATE TABLE items (
    itm_number VARCHAR2(10) NOT NULL,
        name VARCHAR2(20) NOT NULL,
    description VARCHAR2(50) NOT NULL,
    category VARCHAR2(25) NOT NULL,
    color VARCHAR2(15),
    "Size" CHAR (1),
    ilt_id VARCHAR2 (11) NOT NULL,
    CONSTRAINT item_pk PRIMARY KEY (itm_number)
)
```

Table created.

Statement 3

```
CREATE TABLE sales_representatives (
    id VARCHAR2(4) NOT NULL,
    email VARCHAR2(50) NOT NULL,
    first_name VARCHAR2(20) NOT NULL,
    last_name VARCHAR2(30) NOT NULL,
    phone_number VARCHAR2(11) NOT NULL,
    commission_rate NUMBER(2) NOT NULL,
    suvervisor_id VARCHAR2(4) NOT NULL,
    CONSTRAINT sales_representative_pk PRIMARY KEY (id),
    CONSTRAINT sre_email_uk UNIQUE (email)
)
```

```
Table created.
```

Statement 4

```
CREATE TABLE sales_rep_adresses (
    id VARCHAR2(4) NOT NULL,
    address_line_1 VARCHAR2(30) NOT NULL,
    address_line_2 VARCHAR2(30),
    city VARCHAR2(15) NOT NULL,
    zip_code VARCHAR2(7) NOT NULL,
    CONSTRAINT sales_rep_address_pk PRIMARY KEY (id)
)
```

```
Table created.
```

Statement 5

```
CREATE TABLE customers (
    ctr_number VARCHAR2(6) NOT NULL,
    email VARCHAR2(50) NOT NULL,
    first_name VARCHAR2(20) NOT NULL,
    last_name VARCHAR2(30) NOT NULL,
    phone_number VARCHAR2(11) NOT NULL,
    current_balance NUMBER(6,2) NOT NULL,
    sre_id VARCHAR2(4),
    tem_id VARCHAR2(4),
    loyalty_card_number VARCHAR2(6),
    CONSTRAINT customer_pk PRIMARY KEY (ctr_number), CONSTRAINT ctr_email_uk UNIQUE (email),
    CONSTRAINT ctr_lcn_uk UNIQUE (loyalty_card_number)
)
```

```
Table created.
```

Statement 6

```
CREATE TABLE customers_addresses (
    id VARCHAR2(8) NOT NULL,
    address_line_1 VARCHAR2(30) NOT NULL,
    address_line_2 VARCHAR2(30),
    city VARCHAR2(15) NOT NULL,
    zip_code VARCHAR2(7) NOT NULL,
    ctr_number VARCHAR2(6) NOT NULL,
        CONSTRAINT customer_address_pk PRIMARY KEY (id)
)
```

```
Table created.
```

Statement 7

```
CREATE TABLE orders (
    id VARCHAR2(9) NOT NULL,
    odr_date DATE NOT NULL,
    odr_time DATE NOT NULL,
    number_of_units NUMBER(2) NOT NULL,
    ctr_numebr VARCHAR2(6) NOT NULL,
    CONSTRAINT orders_pk PRIMARY KEY (id)
)
```

```
Table created.
```

Statement 8

```
CREATE TABLE ordered_items (
    quantity_ordered NUMBER(3) NOT NULL,
    quantity_shipped NUMBER(3) NOT NULL,
    itm_number VARCHAR2(10) NOT NULL,
    odr_id VARCHAR2(9) NOT NULL,
    CONSTRAINT ordered_item_pk PRIMARY KEY (itm_number, odr_id)
)
```

```
Table created.
```

Statement 9

```
ALTER TABLE customers ADD CONSTRAINT customer_sales_rep_fk FOREIGN KEY (sre_id)
REFERENCES sales_representatives (id)
```

```
Table altered.
```

Statement 10

```
ALTER TABLE customers ADD CONSTRAINT order_customer_fk FOREIGN KEY (ctr_number)
REFERENCES customers (ctr_number)
```

```
Table altered.
```

Statement 11

```
ALTER TABLE ordered_items ADD CONSTRAINT ordered_item_item_fk FOREIGN KEY (itm_number)
REFERENCES orders (id)
```

```
Table altered.
```

Statement 12

```
CREATE TABLE price_history (
    start_date DATE NOT NULL,
    start_time DATE NOT NULL,
    price NUMBER(7,2) NOT NULL,
    end_date DATE,
    end_time DATE,
    itm_number VARCHAR2(10) NOT NULL,
    CONSTRAINT price_history_pk PRIMARY KEY (itm_number, start_date,start_time),
    CONSTRAINT price_history_item_fk FOREIGN KEY (itm_number) REFERENCES items (itm_number)
)
```

```
Table created.
```

Statement 13

```
CREATE TABLE teams (
    id VARCHAR2(4) NOT NULL,
    name VARCHAR2(20) NOT NULL,
    number_of_players NUMBER(2) NOT NULL,
    discount NUMBER(2),
    CONSTRAINT team_pk PRIMARY KEY (id)
)
```

Table created.

Statement 14

```
ALTER TABLE CUSTOMERS_ADDRESSES ADD CONSTRAINT customer_address_customer_fk FOREIGN KEY (ctr_number)
REFERENCES customers (ctr_number)
```

Table altered.

Statement 15

```
ALTER TABLE sales_representatives ADD CONSTRAINT sales_rep_sales_rep_fk FOREIGN KEY (suvervisor_id) REFERENCES sales_representatives (id)
```

Table altered.

Statement 16

```
ALTER TABLE customers ADD CONSTRAINT customer_team_fk FOREIGN KEY (tem_id)
REFERENCES teams (id)
```

Table altered.

Statement 17

```
ALTER TABLE sales_rep_adresses ADD CONSTRAINT sales_rep_add_sales_rep_fk FOREIGN KEY (id)
REFERENCES sales_representatives (id)
```

Table altered.

Statement 18

```
CREATE OR REPLACE TRIGGER fkntm_orders BEFORE
        UPDATE OF ctr_numebr ON orders
BEGIN
        raise_application_error(
        -20225,
        'Non Transferable FK constraint on table orders is violated'
        );
END;
```

Trigger created.

2. Open the “sports data.sql” and look at the order the data is being added there, does your list match? This file can be found in the Section 6 Lesson 4 interaction (sports data.zip) and must first be extracted.

| ID | ODR_DATE | ODR_TIME | NUMBER_OF_UNITS | CTR_NUMBER |
|---|---|---|---|---|
| or0101250 | 17-APR-17 | 17-APR-17 | 10 | c00001 |
| or0101350 | 24-MAY-17 | 24-MAY-17 | 5 | c00001 |
| or0101425 | 28-MAY-17 | 28-MAY-17 | 18 | c00103 |
| or0101681 | 02-JUN-17 | 02-JUN-17 | 10 | c00001 |
| or0101750 | 18-JUN-17 | 18-JUN-17 | 1 | c01986 |

Yes, it’s matched

3. Run the “sports data.sql” script in APEX to populate your tables
4. Check that no errors occurred when you ran the script.

SQL Worksheet

```
1  INSERT INTO inventory_list (id, cost, units)
2  VALUES('il010230124', 2.5, 100);
3
4  INSERT INTO inventory_list (id, cost, units)
5  VALUES('il010230125', 7.99, 250);
6
7  INSERT INTO inventory_list (id, cost, units)
8  VALUES('il010230126', 5.24, 87);
9
10 INSERT INTO inventory_list (id, cost, units)
11 VALUES('il010230127', 18.95, 65);
12
13 INSERT INTO inventory_list (id, cost, units)
14 VALUES('il010230128', 97.46, 8);
```

```
1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.

1 row(s) inserted.
```

## Part 2- Inserting rows to the system

1. Add a new team to the system

| id | name | Number_of_players | discount |
|---|---|---|---|
| t004 | Jets | 10 | 5 |

SQL Worksheet

```
1  INSERT INTO teams(id, name, Number_of_players, discount) VALUES ('t004', 'Jets', '10', '5')
```

```
1 row(s) inserted.
```

| ID | NAME | NUMBER_OF_PLAYERS | DISCOUNT |
|---|---|---|---|
| t001 | Rockets | 25 | 10 |
| t002 | Celtics | 42 | 20 |
| t003 | Rovers | 8 | - |
| t004 | Jets | 10 | 5 |

2. Add a new Customer with the following details to the system

| ctr number | email | First name | Last name | Phone number | Current balance | Loyalty card number | tem id | sre id |
|---|---|---|---|---|---|---|---|---|
| c02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | -5 | lc4587 | | |

SQL Worksheet

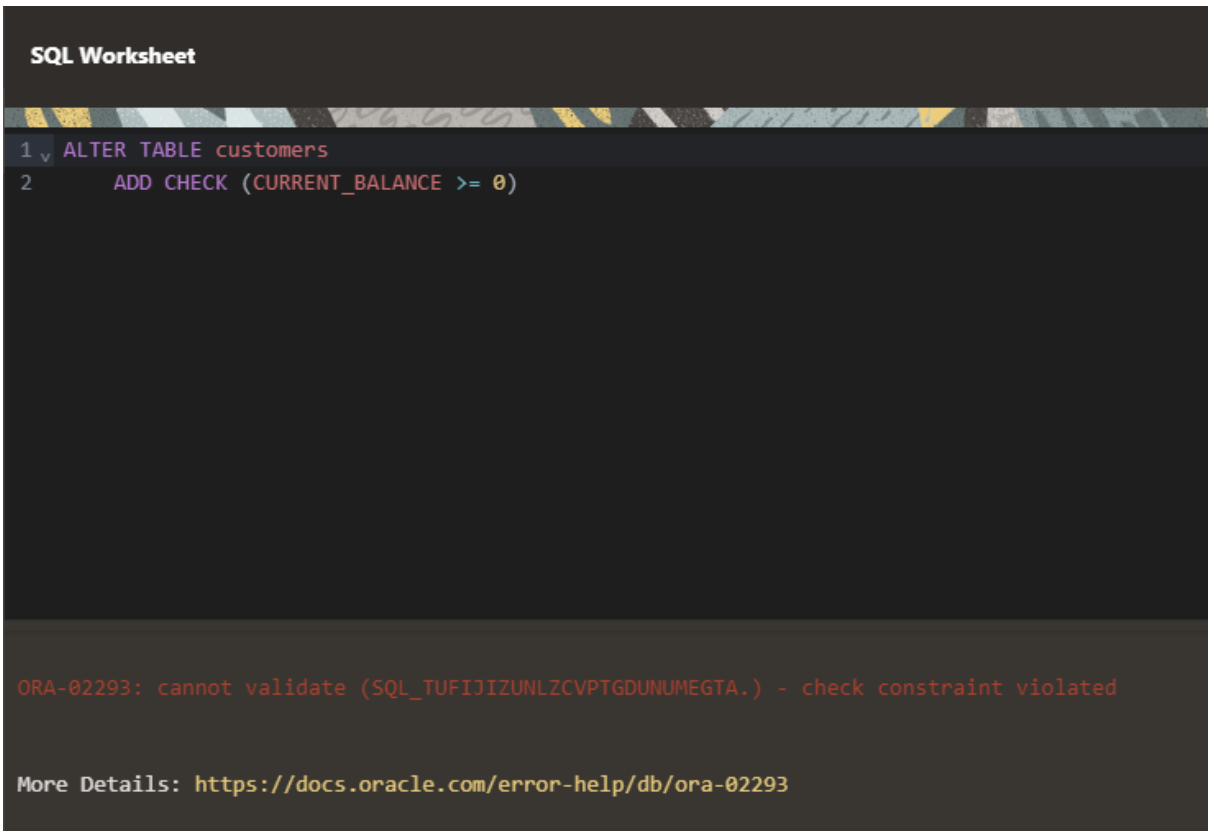
```
1 INSERT INTO customers (ctr_number, email, first_name, last_name, phone_number, current_balance, loyalty_card_number)
2 VALUES ('c02001','brianrog@hootech.com','Brian','Rogers','01654564898','-5','lc4587')
```

```
1 row(s) inserted.
```

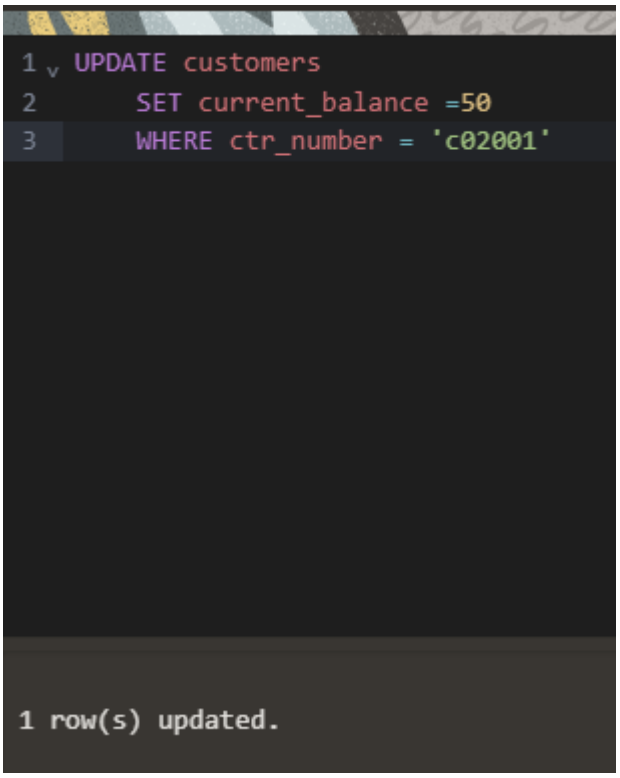
| CTR_NUMBER | EMAIL | FIRST_NAME | LAST_NAME | PHONE_NUMBER | CURRENT_BALANCE | SRE_ID | TEM_ID | LOYALTY_CARD_NUMBER |
|---|---|---|---|---|---|---|---|---|
| c02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | -5 | - | - | lc4587 |
| c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 01234567898 | 150 | sr01 | t001 | - |
| c00012 | Jjones@freemail.com | Jennifer | Jones | 01505214598 | 0 | - | - | lc1015 |
| c00101 | unknown@here.com | John | Doe | 03216547808 | 987.5 | sr01 | t002 | - |
| c00103 | MurciaA@globaltech.com | Andrew | Murcia | 07715246890 | 85 | - | - | lc2341 |
| c01986 | margal87@delphiview.com | Maria | Galant | 01442736589 | 125.65 | sr03 | t003 | - |

3. This information violates the check constraint that the current balance must not be less than zero. Change the current balance to 50 and rerun the query.

a) Information Violates




b) Change the current balance to 50




c) Data update

SQL Worksheet

```
select
    "CTR_NUMBER",
    "EMAIL",
    "FIRST_NAME",
    "LAST_NAME",
    "PHONE_NUMBER",
    "CURRENT_BALANCE",
    "SRE_ID",
    "TEM_ID",
    "LOYALTY_CARD_NUMBER"
from "CUSTOMERS";
```

| CTR_NUMBER | EMAIL | FIRST_NAME | LAST_NAME | PHONE_NUMBER | CURRENT_BALANCE | SRE_ID | TEM_ID | LOYALTY_CARD_NUMBER |
|---|---|---|---|---|---|---|---|---|
| c02001 | brianrog@hootech.com | Brian | Rogers | 01654564898 | 50 | - | - | lc4587 |
| c00001 | bob.thornberry@heatmail.com | Robert | Thornberry | 01234567898 | 150 | sr01 | t001 | - |
| c00012 | Jjones@freemail.com | Jennifer | Jones | 01505214598 | 0 | - | - | lc1015 |
| c00101 | unknown@here.com | John | Doe | 03216547808 | 987.5 | sr01 | t002 | - |
| c00103 | MurciaA@globaltech.com | Andrew | Murcia | 07715246890 | 85 | - | - | lc2341 |
| c01986 | margal87@delphiview.com | Maria | Galant | 01442736589 | 125.65 | sr03 | t003 | - |

**Section 6 Lesson 4 Exercise 2: Data Manipulation Language**

**Use DML operations to manage database tables (S6L4 Objective 2)**

**Part 1- Updating rows to the system**

1. Run the following query to view the content of the price_history table:

   SELECT start_date, TO_CHAR (start_time, 'HH24:MI:SS'), price, end_date, TO_CHAR (end_time, 'HH24:MI')

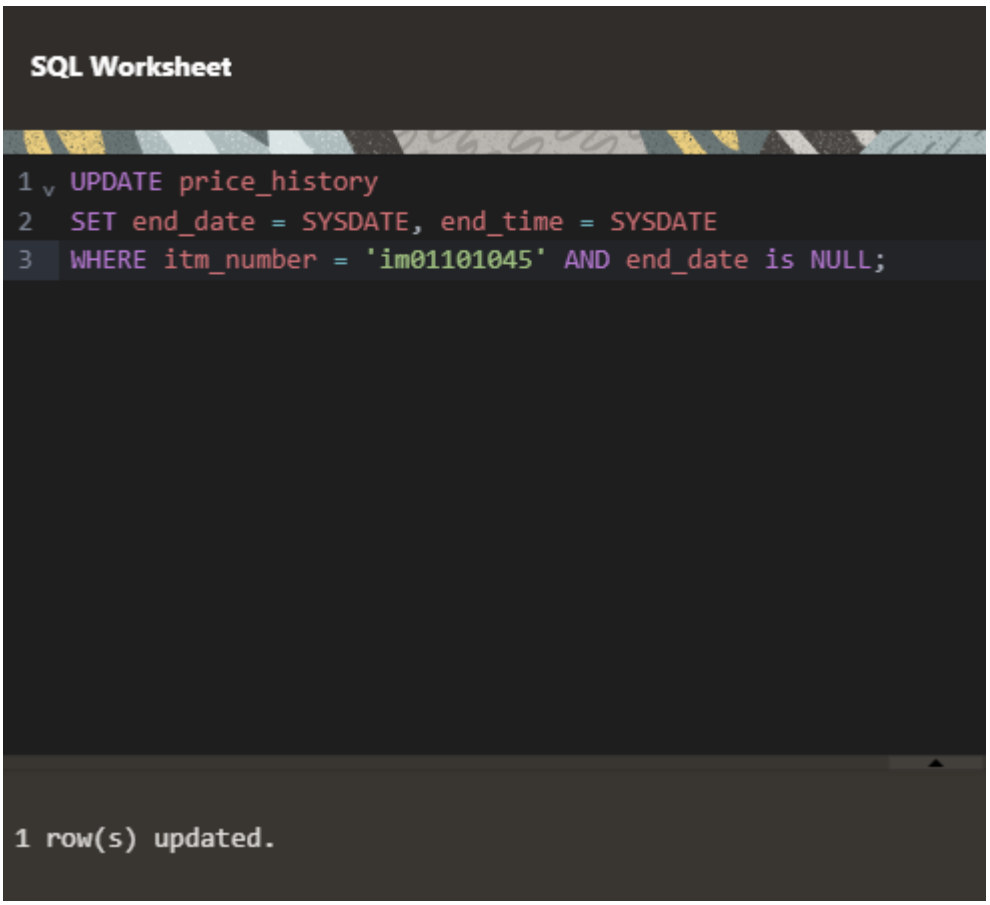
   FROM price_history;

SQL Worksheet

```
1 SELECT start_date, TO_CHAR (start_time, 'HH24:MI:SS'), price, end_date, TO_CHAR (end_time, 'HH24:MI')
2 FROM price_history;
3
```

| START_DATE | TO_CHAR(START_TIME,'HH24:MI:SS') | PRICE | END_DATE | TO_CHAR(END_TIME,'HH24:MI') |
|---|---|---|---|---|
| 17-JUN-17 | 09:00:00 | 4.99 | - | - |
| 25-NOV-16 | 09:00:00 | 14.99 | 25-JAN-17 | 17:00 |
| 25-JAN-17 | 17:01:00 | 8.99 | 25-JAN-17 | 19:00 |
| 26-JAN-17 | 09:00:00 | 15.99 | - | - |
| 12-FEB-17 | 12:30:00 | 7.99 | - | - |
| 25-APR-17 | 10:10:10 | 24.99 | - | - |
| 31-MAY-17 | 16:35:30 | 149 | - | - |

2. Obl is going to update the price of the premium bat so you will need to write a query that will close off the current price by adding the system date values to the end_date and end_time fields. To run this query you will need to both match the item number and identify that the end date is null. This ensures that you are updating the latest price.



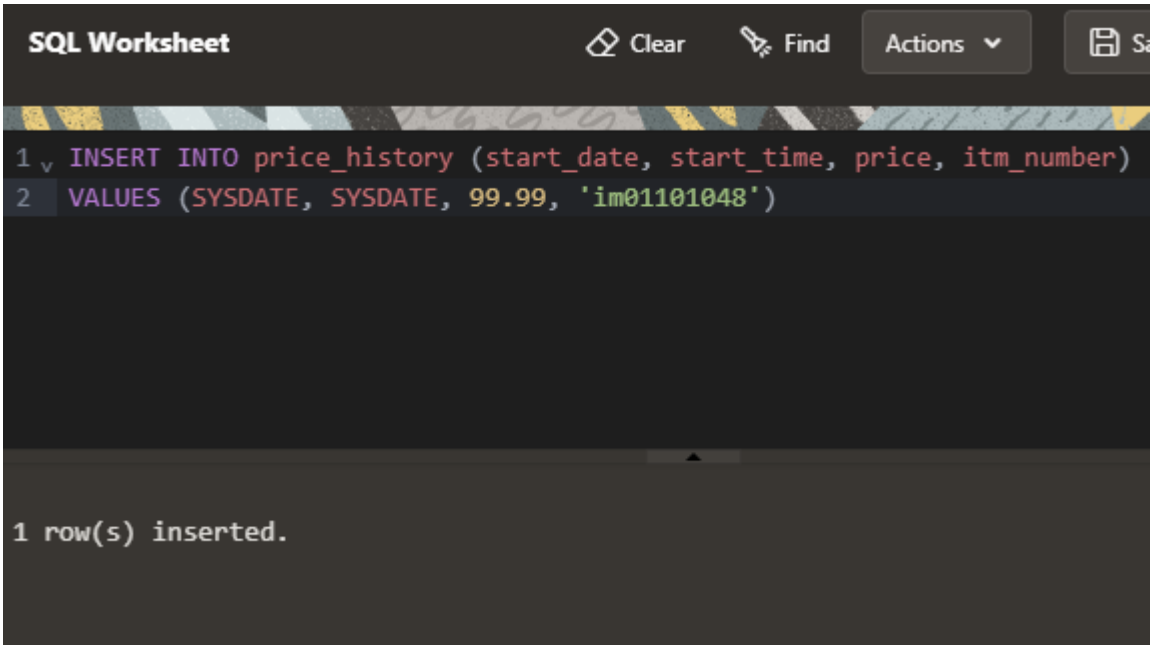

3. Rerun the select statement on the price_history table to ensure that the statement has been executed.

SQL Worksheet

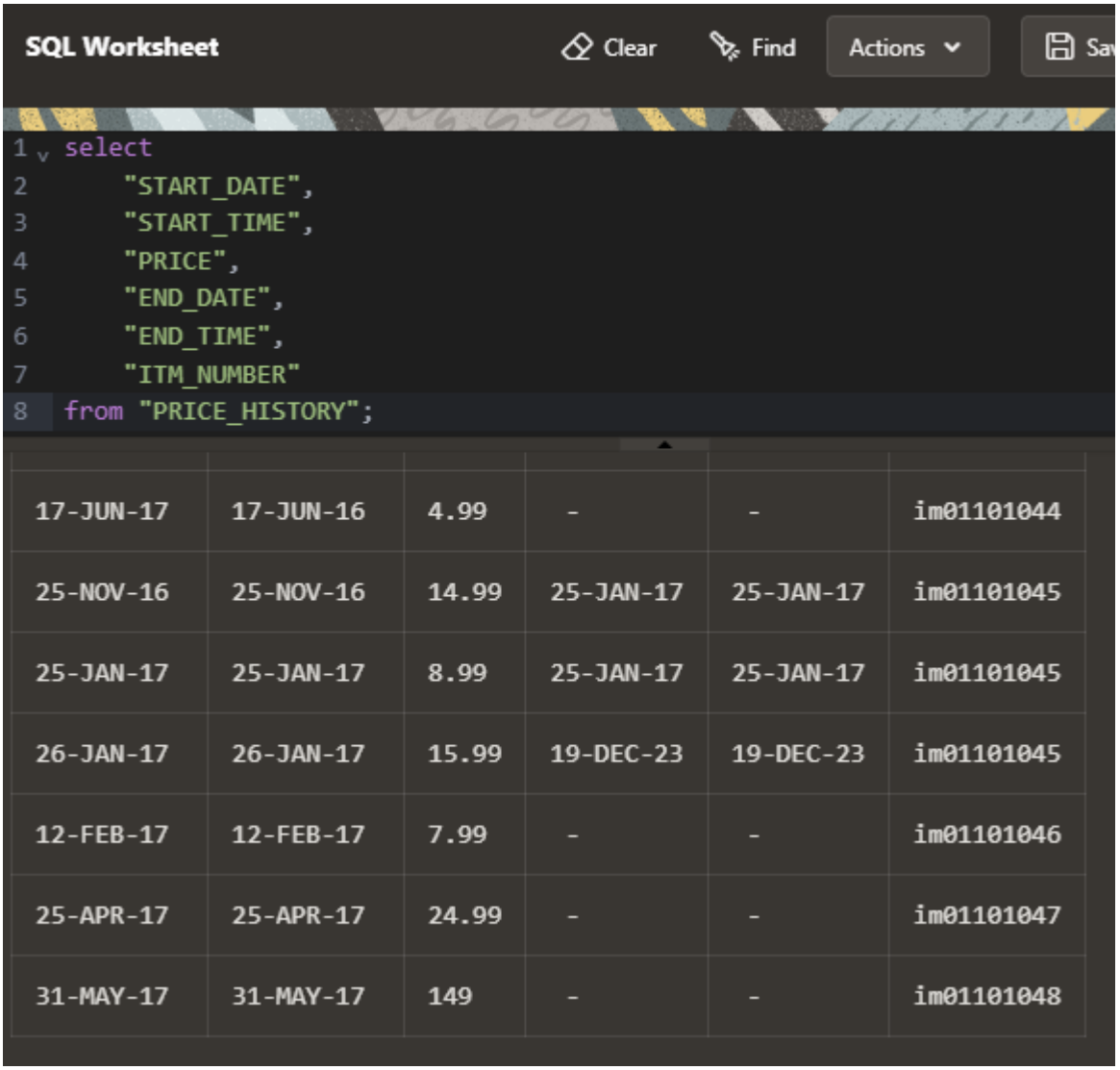
```
select
    "START_DATE",
    "START_TIME",
    "PRICE",
    "END_DATE",
    "END_TIME",
    "ITM_NUMBER"
from "PRICE_HISTORY";
```

| START_DATE | START_TIME | PRICE | END_DATE | END_TIME | ITM_NUMBER |
|---|---|---|---|---|---|
| 17-JUN-17 | 17-JUN-16 | 4.99 | - | - | im01101044 |
| 25-NOV-16 | 25-NOV-16 | 14.99 | 25-JAN-17 | 25-JAN-17 | im01101045 |
| 25-JAN-17 | 25-JAN-17 | 8.99 | 25-JAN-17 | 25-JAN-17 | im01101045 |
| 26-JAN-17 | 26-JAN-17 | 15.99 | 19-DEC-23 | 19-DEC-23 | im01101045 |
| 12-FEB-17 | 12-FEB-17 | 7.99 | - | - | im01101046 |
| 25-APR-17 | 25-APR-17 | 24.99 | - | - | im01101047 |
| 31-MAY-17 | 31-MAY-17 | 149 | - | - | im01101048 |

4. Insert a new row that will use the current date and time to set the new price of the premium bat to be 99.99.

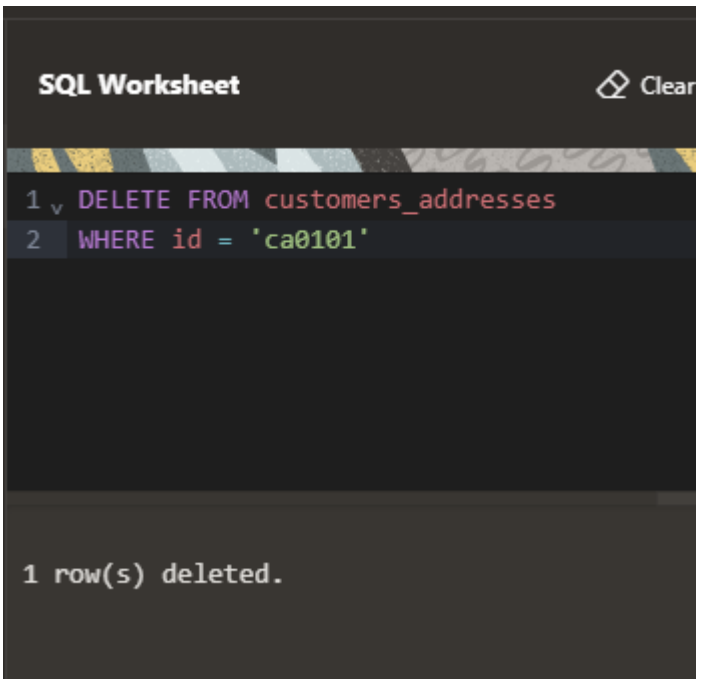



5. Rerun the select statement on the price_history table to ensure that the statement has been executed.




**Part 2: Deleting rows from the system**

1. Bob Thornberry has contacted Obl to ask that the 83 Barrhill Drive address be removed from the system as he can longer receive parcels at this address. Write a SQL statement that will remove this address from the system.




2. Run a select statement on the customers_addresses table to ensure that the statement has been executed.

SQL Worksheet

Clear Find

```
select
    "ID",
    "ADDRESS_LINE_1",
    "ADDRESS_LINE_2",
    "CITY",
    "ZIP_CODE",
    "CTR_NUMBER"
from "CUSTOMERS_ADDRESSES";
```

| ID | ADDRESS_LINE_1 | ADDRESS_LINE_2 | CITY | ZIP_CODE | CTR_NUMBER |
|---|---|---|---|---|---|
| ca0102 | 17 Gartsquare Road | Starford | Liverpool | LP89JHK | c00001 |
| ca0103 | 54 Ropehill Crescent | Georgetown | Star | ST45AGV | c00101 |
| ca0104 | 36 Watercress Lane | - | Jump | JP23YTH | c01986 |
| ca0105 | 63 Acacia Drive | Skins | Liverpool | LP83JHR | c00001 |