Varsity College - School of IT

Advanced Databased (ADDB7311) Assignment 2

Bachelor of Computer Science in Application Development

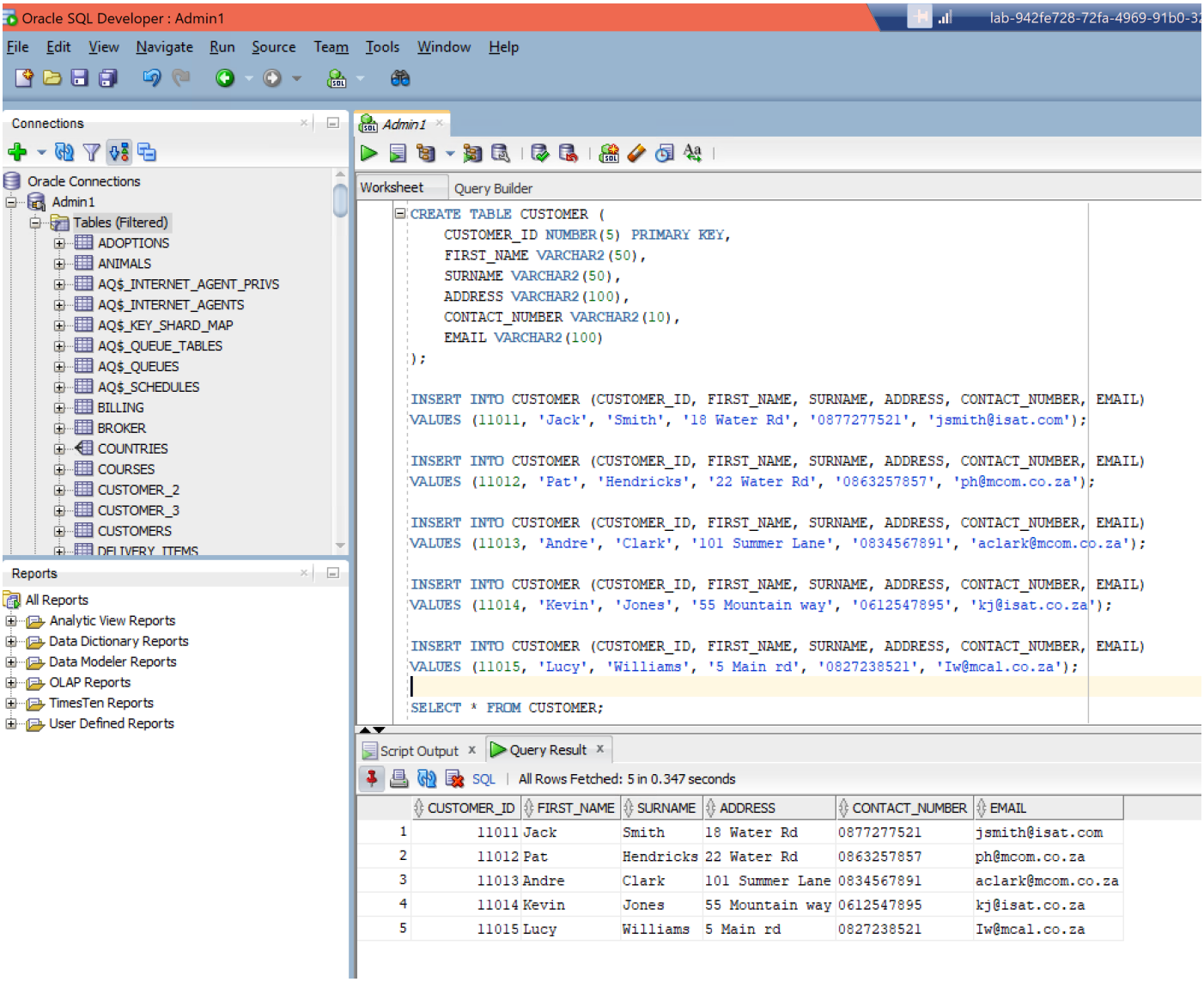
Submitted by:
Cameron Chetty - ST10251759

October 07, 2024

QUESTION 1

Schema for Creating Tables and Insert Scripts

```
-- Customer Table
CREATE TABLE CUSTOMER (
    CUSTOMER_ID NUMBER(5) PRIMARY KEY,
    FIRST_NAME VARCHAR2(50),
    SURNAME VARCHAR2(50),
    ADDRESS VARCHAR2(100),
    CONTACT_NUMBER VARCHAR2(10),
    EMAIL VARCHAR2(100)
);


INSERT INTO CUSTOMER (CUSTOMER_ID, FIRST_NAME, SURNAME, ADDRESS,
CONTACT_NUMBER, EMAIL)
VALUES (11011, 'Jack', 'Smith', '18 Water Rd', '0877277521', 'jsmith@isat.com');


INSERT INTO CUSTOMER (CUSTOMER_ID, FIRST_NAME, SURNAME, ADDRESS,
CONTACT_NUMBER, EMAIL)
VALUES (11012, 'Pat', 'Hendricks', '22 Water Rd', '0863257857', 'ph@mcom.co.za');


INSERT INTO CUSTOMER (CUSTOMER_ID, FIRST_NAME, SURNAME, ADDRESS,
CONTACT_NUMBER, EMAIL)
VALUES (11013, 'Andre', 'Clark', '101 Summer Lane', '0834567891', 'aclark@mcom.co.za');


INSERT INTO CUSTOMER (CUSTOMER_ID, FIRST_NAME, SURNAME, ADDRESS,
CONTACT_NUMBER, EMAIL)
VALUES (11014, 'Kevin', 'Jones', '55 Mountain way', '0612547895', 'kj@isat.co.za');


INSERT INTO CUSTOMER (CUSTOMER_ID, FIRST_NAME, SURNAME, ADDRESS,
CONTACT_NUMBER, EMAIL)
VALUES (11015, 'Lucy', 'Williams', '5 Main rd', '0827238521', 'Iw@mcal.co.za');
```




```
-- Employee Table
CREATE TABLE EMPLOYEE (
    EMPLOYEE_ID VARCHAR2(10) PRIMARY KEY,
    FIRST_NAME VARCHAR2(50),
    SURNAME VARCHAR2(50),
    CONTACT_NUMBER VARCHAR2(10),
    ADDRESS VARCHAR2(100),
    EMAIL VARCHAR2(100)
);
INSERT INTO EMPLOYEE (EMPLOYEE_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER,
ADDRESS, EMAIL)
VALUES ('emp101', 'Jeff', 'Davis', '0877272510', '10 main road', 'jand@isat.com');
```

INSERT INTO EMPLOYEE (EMPLOYEE_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, ADDRESS, EMAIL)

VALUES ('emp102', 'Kevin', 'Marks', '0837377522', '18 water road', 'km@isat.com');

INSERT INTO EMPLOYEE (EMPLOYEE_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, ADDRESS, EMAIL)

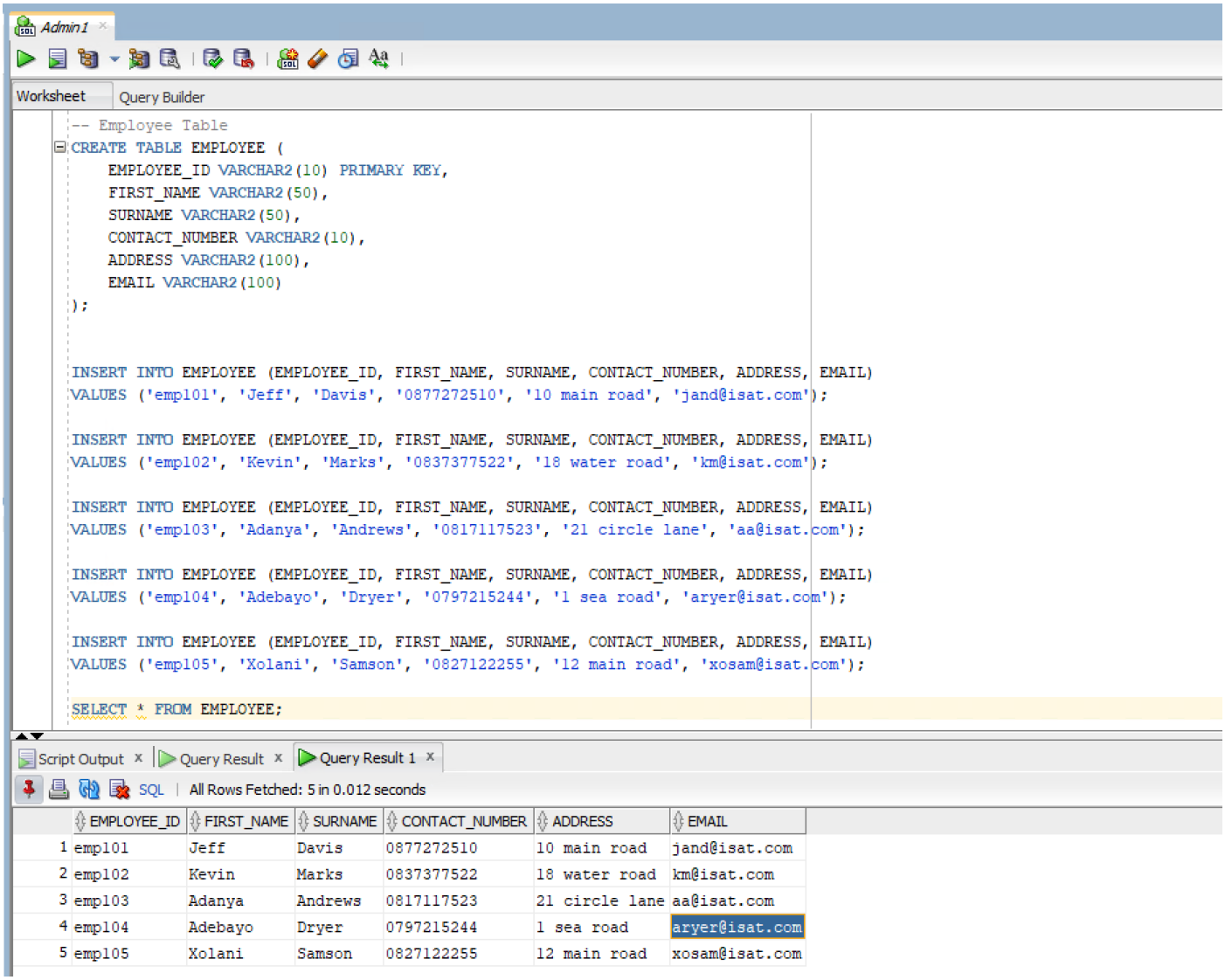
VALUES ('emp103', 'Adanya', 'Andrews', '0817117523', '21 circle lane', 'aa@isat.com');

INSERT INTO EMPLOYEE (EMPLOYEE_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, ADDRESS, EMAIL)

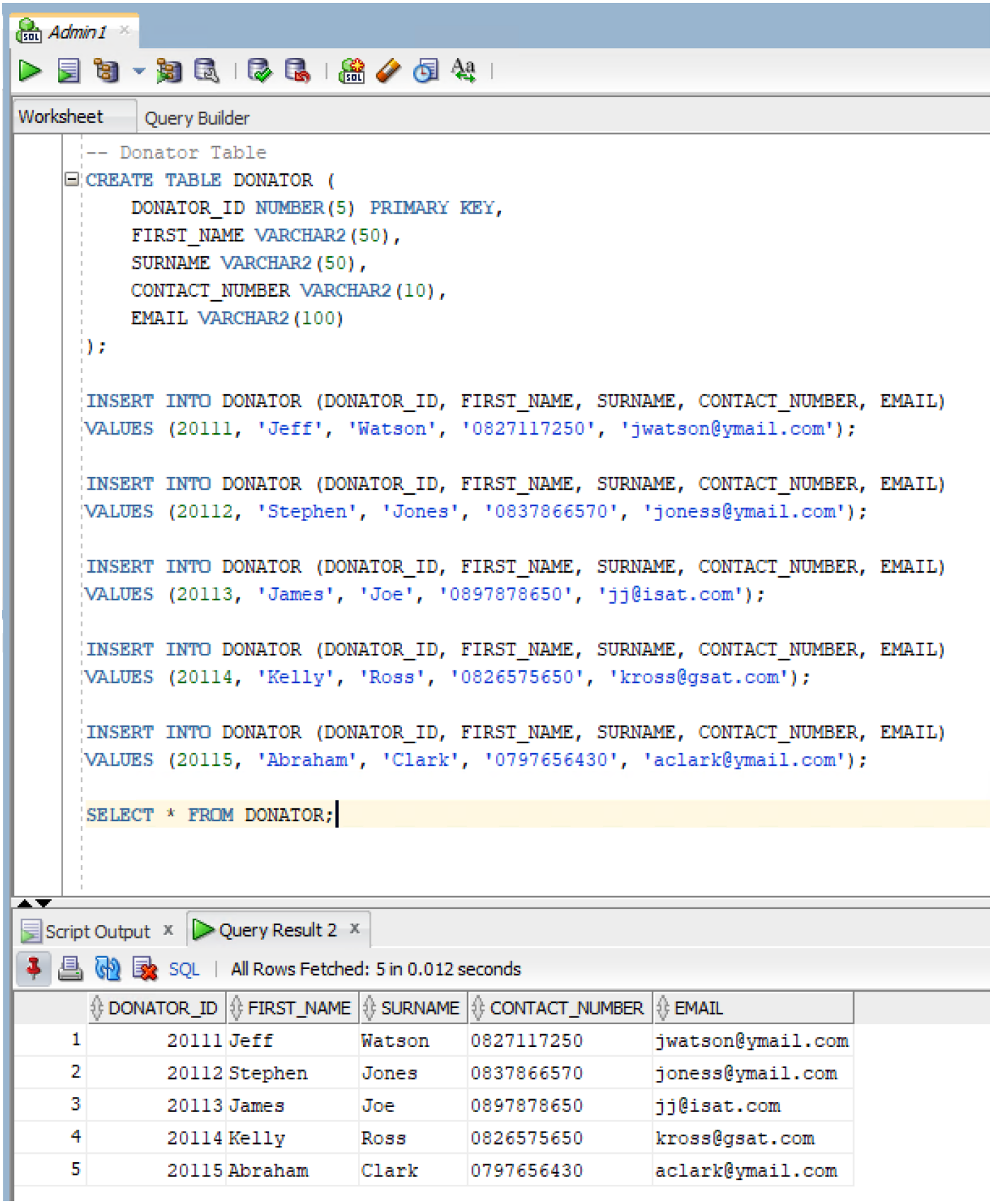
VALUES ('emp104', 'Adebayo', 'Dryer', '0797215244', '1 sea road', 'aryer@isat.com');

INSERT INTO EMPLOYEE (EMPLOYEE_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, ADDRESS, EMAIL)

VALUES ('emp105', 'Xolani', 'Samson', '0827122255', '12 main road', 'xosam@isat.com');



```
-- Donator Table
CREATE TABLE DONATOR (
    DONATOR_ID NUMBER(5) PRIMARY KEY,
    FIRST_NAME VARCHAR2(50),
    SURNAME VARCHAR2(50),
    CONTACT_NUMBER VARCHAR2(10),
    EMAIL VARCHAR2(100)
);


INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER,
EMAIL)
VALUES (20111, 'Jeff', 'Watson', '0827117250', 'jwatson@ymail.com');


INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER,
EMAIL)
VALUES (20112, 'Stephen', 'Jones', '0837866570', 'joness@ymail.com');


INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER,
EMAIL)
VALUES (20113, 'James', 'Joe', '0897878650', 'jj@isat.com');


INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER,
EMAIL)
VALUES (20114, 'Kelly', 'Ross', '0826575650', 'kross@gsat.com');


INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER,
EMAIL)
VALUES (20115, 'Abraham', 'Clark', '0797656430', 'aclark@ymail.com');
```

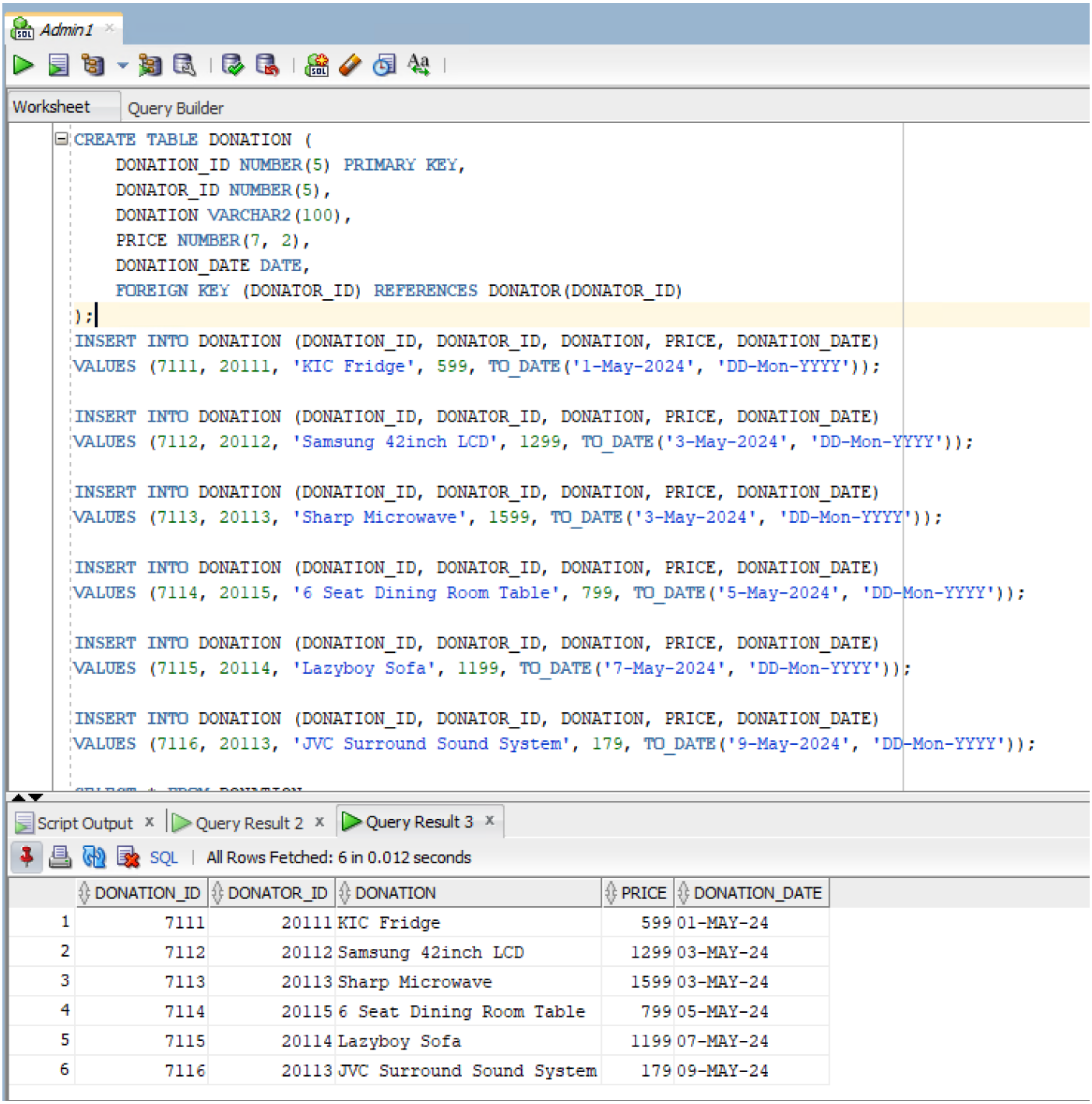


```
-- Donator Table
CREATE TABLE DONATOR (
    DONATOR_ID NUMBER(5) PRIMARY KEY,
    FIRST_NAME VARCHAR2(50),
    SURNAME VARCHAR2(50),
    CONTACT_NUMBER VARCHAR2(10),
    EMAIL VARCHAR2(100)
);

INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, EMAIL)
VALUES (20111, 'Jeff', 'Watson', '0827117250', 'jwatson@ymail.com');

INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, EMAIL)
VALUES (20112, 'Stephen', 'Jones', '0837866570', 'joness@ymail.com');

INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, EMAIL)
VALUES (20113, 'James', 'Joe', '0897878650', 'jj@isat.com');

INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, EMAIL)
VALUES (20114, 'Kelly', 'Ross', '0826575650', 'kross@gsat.com');

INSERT INTO DONATOR (DONATOR_ID, FIRST_NAME, SURNAME, CONTACT_NUMBER, EMAIL)
VALUES (20115, 'Abraham', 'Clark', '0797656430', 'aclark@ymail.com');

SELECT * FROM DONATOR;
```

All Rows Fetched: 5 in 0.012 seconds

	DONATOR_ID	FIRST_NAME	SURNAME	CONTACT_NUMBER	EMAIL
1	20111	Jeff	Watson	0827117250	jwatson@ymail.com
2	20112	Stephen	Jones	0837866570	joness@ymail.com
3	20113	James	Joe	0897878650	jj@isat.com
4	20114	Kelly	Ross	0826575650	kross@gsat.com
5	20115	Abraham	Clark	0797656430	aclark@ymail.com

```
-- Donation Table
CREATE TABLE DONATION (
    DONATION_ID NUMBER(5) PRIMARY KEY,
    DONATOR_ID NUMBER(5),
    DONATION VARCHAR2(100),
    PRICE NUMBER(7, 2),
    DONATION_DATE DATE,
    FOREIGN KEY (DONATOR_ID) REFERENCES DONATOR(DONATOR_ID)
);


INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE,
DONATION_DATE)
VALUES (7111, 20111, 'KIC Fridge', 599, TO_DATE('1-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE,
DONATION_DATE)
VALUES (7112, 20112, 'Samsung 42inch LCD', 1299, TO_DATE('3-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE,
DONATION_DATE)
VALUES (7113, 20113, 'Sharp Microwave', 1599, TO_DATE('3-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE,
DONATION_DATE)
VALUES (7114, 20115, '6 Seat Dining Room Table', 799, TO_DATE('5-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE,
DONATION_DATE)
VALUES (7115, 20114, 'Lazyboy Sofa', 1199, TO_DATE('7-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE,
DONATION_DATE)
VALUES (7116, 20113, 'JVC Surround Sound System', 179, TO_DATE('9-May-2024', 'DD-Mon-YYYY'));
```



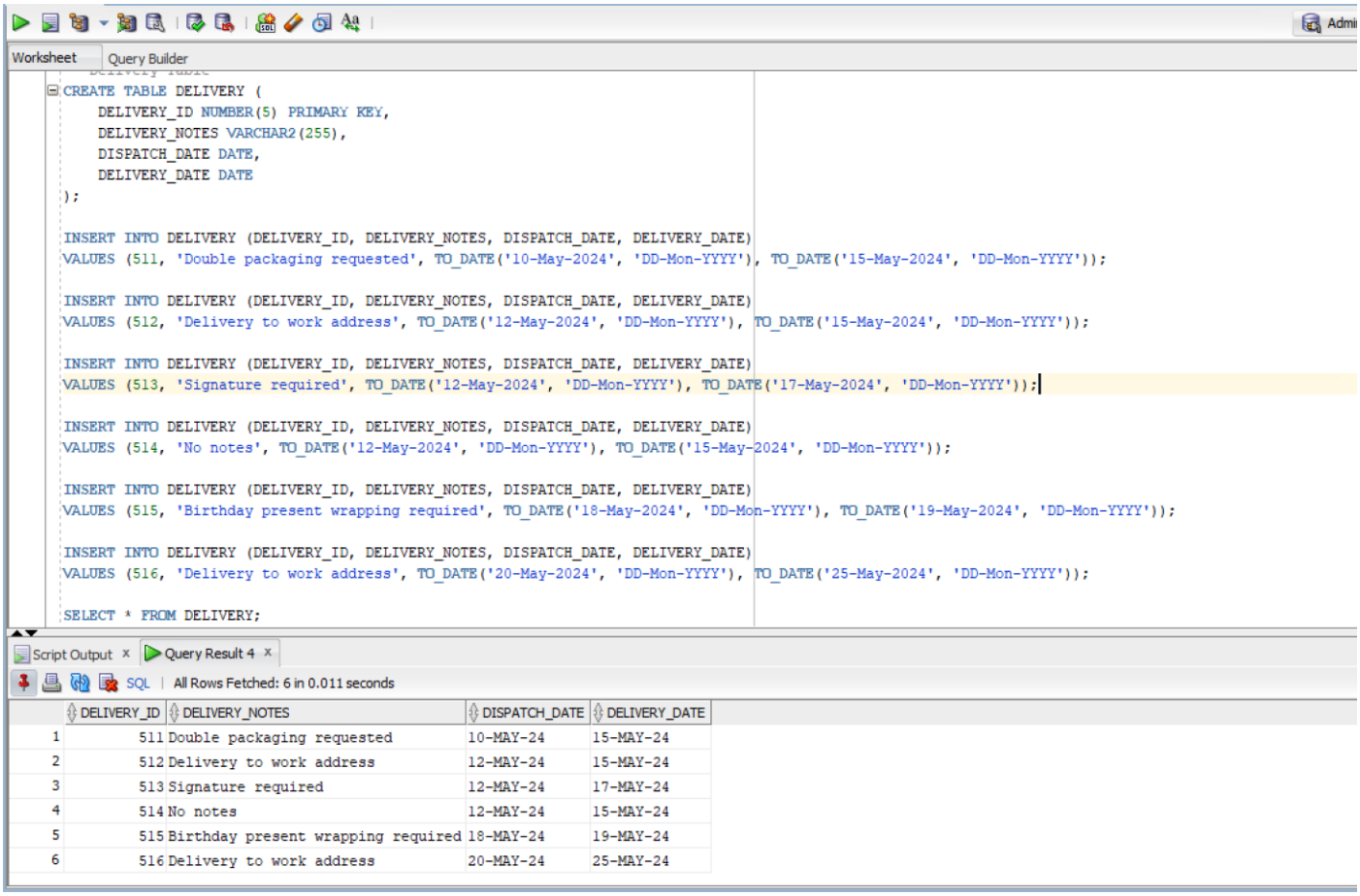
```
CREATE TABLE DONATION (
    DONATION_ID NUMBER(5) PRIMARY KEY,
    DONATOR_ID NUMBER(5),
    DONATION VARCHAR2(100),
    PRICE NUMBER(7, 2),
    DONATION_DATE DATE,
    FOREIGN KEY (DONATOR_ID) REFERENCES DONATOR(DONATOR_ID)
);
INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE, DONATION_DATE)
VALUES (7111, 20111, 'KIC Fridge', 599, TO_DATE('1-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE, DONATION_DATE)
VALUES (7112, 20112, 'Samsung 42inch LCD', 1299, TO_DATE('3-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE, DONATION_DATE)
VALUES (7113, 20113, 'Sharp Microwave', 1599, TO_DATE('3-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE, DONATION_DATE)
VALUES (7114, 20115, '6 Seat Dining Room Table', 799, TO_DATE('5-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE, DONATION_DATE)
VALUES (7115, 20114, 'Lazyboy Sofa', 1199, TO_DATE('7-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DONATION (DONATION_ID, DONATOR_ID, DONATION, PRICE, DONATION_DATE)
VALUES (7116, 20113, 'JVC Surround Sound System', 179, TO_DATE('9-May-2024', 'DD-Mon-YYYY'));
```

All Rows Fetched: 6 in 0.012 seconds

	DONATION_ID	DONATOR_ID	DONATION	PRICE	DONATION_DATE
1	7111	20111	KIC Fridge	599	01-MAY-24
2	7112	20112	Samsung 42inch LCD	1299	03-MAY-24
3	7113	20113	Sharp Microwave	1599	03-MAY-24
4	7114	20115	6 Seat Dining Room Table	799	05-MAY-24
5	7115	20114	Lazyboy Sofa	1199	07-MAY-24
6	7116	20113	JVC Surround Sound System	179	09-MAY-24

```
-- Delivery Table
CREATE TABLE DELIVERY (
    DELIVERY_ID NUMBER(5) PRIMARY KEY,
    DELIVERY_NOTES VARCHAR2(255),
    DISPATCH_DATE DATE,
    DELIVERY_DATE DATE
);
```

```
INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE,
DELIVERY_DATE)

VALUES (511, 'Double packaging requested', TO_DATE('10-May-2024', 'DD-Mon-YYYY'),
TO_DATE('15-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE,
DELIVERY_DATE)

VALUES (512, 'Delivery to work address', TO_DATE('12-May-2024', 'DD-Mon-YYYY'), TO_DATE('15-
May-2024', 'DD-Mon-YYYY'));


INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE,
DELIVERY_DATE)

VALUES (513, 'Signature required', TO_DATE('12-May-2024', 'DD-Mon-YYYY'), TO_DATE('17-May-
2024', 'DD-Mon-YYYY'));


INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE,
DELIVERY_DATE)

VALUES (514, 'No notes', TO_DATE('12-May-2024', 'DD-Mon-YYYY'), TO_DATE('15-May-2024', 'DD-
Mon-YYYY'));


INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE,
DELIVERY_DATE)

VALUES (515, 'Birthday present wrapping required', TO_DATE('18-May-2024', 'DD-Mon-YYYY'),
TO_DATE('19-May-2024', 'DD-Mon-YYYY'));


INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE,
DELIVERY_DATE)

VALUES (516, 'Delivery to work address', TO_DATE('20-May-2024', 'DD-Mon-YYYY'), TO_DATE('25-
May-2024', 'DD-Mon-YYYY'));
```



```
CREATE TABLE DELIVERY (
    DELIVERY_ID NUMBER(5) PRIMARY KEY,
    DELIVERY_NOTES VARCHAR2(255),
    DISPATCH_DATE DATE,
    DELIVERY_DATE DATE
);

INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE, DELIVERY_DATE)
VALUES (511, 'Double packaging requested', TO_DATE('10-May-2024', 'DD-Mon-YYYY'), TO_DATE('15-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE, DELIVERY_DATE)
VALUES (512, 'Delivery to work address', TO_DATE('12-May-2024', 'DD-Mon-YYYY'), TO_DATE('15-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE, DELIVERY_DATE)
VALUES (513, 'Signature required', TO_DATE('12-May-2024', 'DD-Mon-YYYY'), TO_DATE('17-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE, DELIVERY_DATE)
VALUES (514, 'No notes', TO_DATE('12-May-2024', 'DD-Mon-YYYY'), TO_DATE('15-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE, DELIVERY_DATE)
VALUES (515, 'Birthday present wrapping required', TO_DATE('18-May-2024', 'DD-Mon-YYYY'), TO_DATE('19-May-2024', 'DD-Mon-YYYY'));

INSERT INTO DELIVERY (DELIVERY_ID, DELIVERY_NOTES, DISPATCH_DATE, DELIVERY_DATE)
VALUES (516, 'Delivery to work address', TO_DATE('20-May-2024', 'DD-Mon-YYYY'), TO_DATE('25-May-2024', 'DD-Mon-YYYY'));

SELECT * FROM DELIVERY;
```

All Rows Fetched: 6 in 0.011 seconds

	DELIVERY_ID	DELIVERY_NOTES	DISPATCH_DATE	DELIVERY_DATE
1	511	Double packaging requested	10-MAY-24	15-MAY-24
2	512	Delivery to work address	12-MAY-24	15-MAY-24
3	513	Signature required	12-MAY-24	17-MAY-24
4	514	No notes	12-MAY-24	15-MAY-24
5	515	Birthday present wrapping required	18-MAY-24	19-MAY-24
6	516	Delivery to work address	20-MAY-24	25-MAY-24

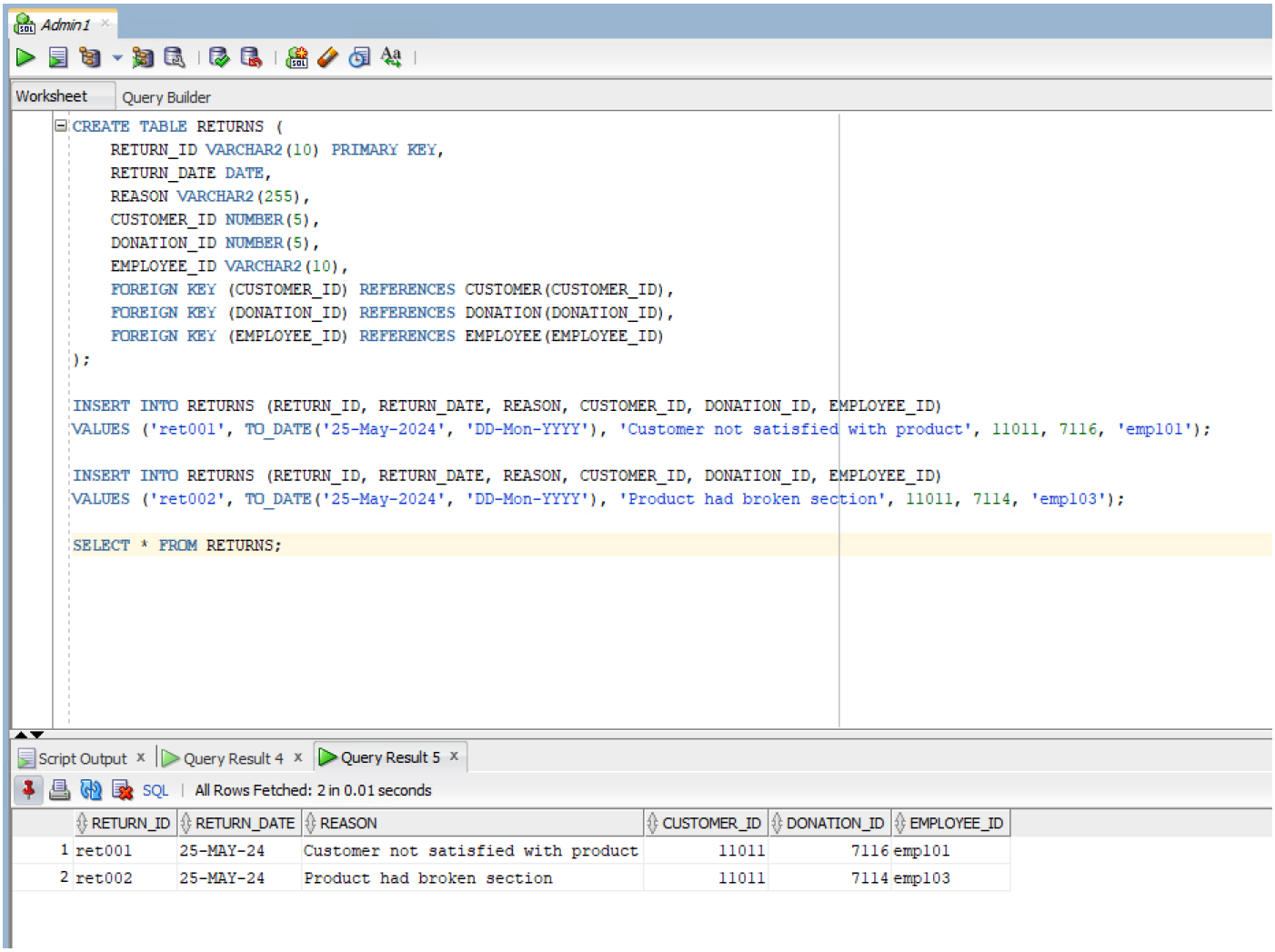
-- Returns Table

```
CREATE TABLE RETURNS (
    RETURN_ID VARCHAR2(10) PRIMARY KEY,
    RETURN_DATE DATE,
    REASON VARCHAR2(255),
    CUSTOMER_ID NUMBER(5),
    DONATION_ID NUMBER(5),
    EMPLOYEE_ID VARCHAR2(10),
    FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMER(CUSTOMER_ID),
    FOREIGN KEY (DONATION_ID) REFERENCES DONATION(DONATION_ID),
    FOREIGN KEY (EMPLOYEE_ID) REFERENCES EMPLOYEE(EMPLOYEE_ID)
);
```

```
INSERT INTO RETURNS (RETURN_ID, RETURN_DATE, REASON, CUSTOMER_ID,
DONATION_ID, EMPLOYEE_ID)
VALUES ('ret001', TO_DATE('25-May-2024', 'DD-Mon-YYYY'), 'Customer not satisfied with product',
11011, 7116, 'emp101');
```

INSERT INTO RETURNS (RETURN_ID, RETURN_DATE, REASON, CUSTOMER_ID, DONATION_ID, EMPLOYEE_ID)

VALUES ('ret002', TO_DATE('25-May-2024', 'DD-Mon-YYYY'), 'Product had broken section', 11011, 7114, 'emp103');



-- Invoice Table

CREATE TABLE INVOICE (

INVOICE_NUM NUMBER(5) PRIMARY KEY,

CUSTOMER_ID NUMBER(5),

INVOICE_DATE DATE,

EMPLOYEE_ID VARCHAR2(10),

DONATION_ID NUMBER(5),

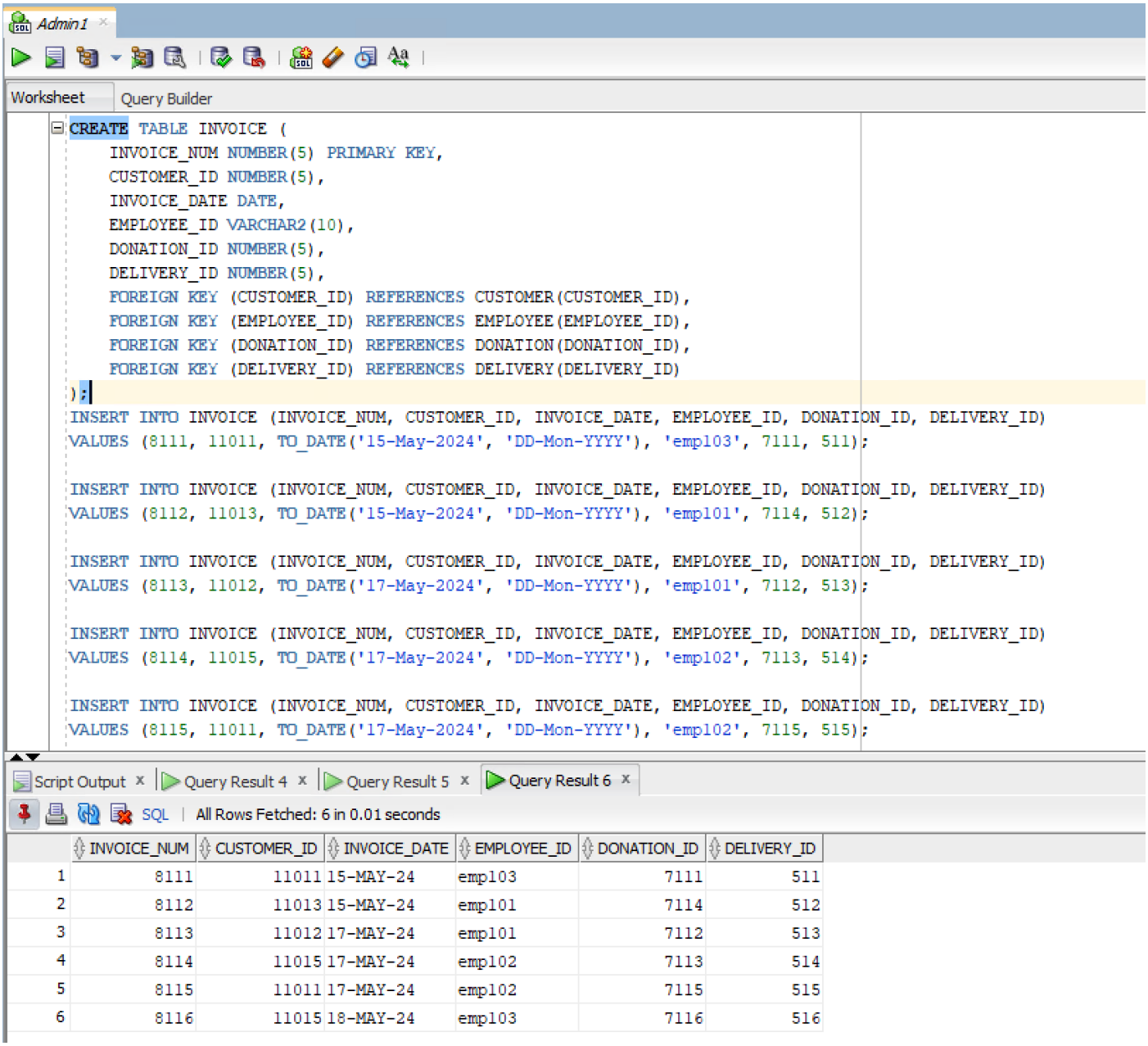
DELIVERY_ID NUMBER(5),

FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMER(CUSTOMER_ID),

FOREIGN KEY (EMPLOYEE_ID) REFERENCES EMPLOYEE(EMPLOYEE_ID),

FOREIGN KEY (DONATION_ID) REFERENCES DONATION(DONATION_ID),

```
    FOREIGN KEY (DELIVERY_ID) REFERENCES DELIVERY(DELIVERY_ID)
);


INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID,
DONATION_ID, DELIVERY_ID)
VALUES (8111, 11011, TO_DATE('15-May-2024', 'DD-Mon-YYYY'), 'emp103', 7111, 511);


INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID,
DONATION_ID, DELIVERY_ID)
VALUES (8112, 11013, TO_DATE('15-May-2024', 'DD-Mon-YYYY'), 'emp101', 7114, 512);


INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID,
DONATION_ID, DELIVERY_ID)
VALUES (8113, 11012, TO_DATE('17-May-2024', 'DD-Mon-YYYY'), 'emp101', 7112, 513);


INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID,
DONATION_ID, DELIVERY_ID)
VALUES (8114, 11015, TO_DATE('17-May-2024', 'DD-Mon-YYYY'), 'emp102', 7113, 514);


INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID,
DONATION_ID, DELIVERY_ID)
VALUES (8115, 11011, TO_DATE('17-May-2024', 'DD-Mon-YYYY'), 'emp102', 7115, 515);


INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID,
DONATION_ID, DELIVERY_ID)
VALUES (8116, 11015, TO_DATE('18-May-2024', 'DD-Mon-YYYY'), 'emp103', 7116, 516);
```



```
CREATE TABLE INVOICE (
    INVOICE_NUM NUMBER(5) PRIMARY KEY,
    CUSTOMER_ID NUMBER(5),
    INVOICE_DATE DATE,
    EMPLOYEE_ID VARCHAR2(10),
    DONATION_ID NUMBER(5),
    DELIVERY_ID NUMBER(5),
    FOREIGN KEY (CUSTOMER_ID) REFERENCES CUSTOMER(CUSTOMER_ID),
    FOREIGN KEY (EMPLOYEE_ID) REFERENCES EMPLOYEE(EMPLOYEE_ID),
    FOREIGN KEY (DONATION_ID) REFERENCES DONATION(DONATION_ID),
    FOREIGN KEY (DELIVERY_ID) REFERENCES DELIVERY(DELIVERY_ID)
);
INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID, DONATION_ID, DELIVERY_ID)
VALUES (8111, 11011, TO_DATE('15-May-2024', 'DD-Mon-YYYY'), 'emp103', 7111, 511);

INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID, DONATION_ID, DELIVERY_ID)
VALUES (8112, 11013, TO_DATE('15-May-2024', 'DD-Mon-YYYY'), 'emp101', 7114, 512);

INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID, DONATION_ID, DELIVERY_ID)
VALUES (8113, 11012, TO_DATE('17-May-2024', 'DD-Mon-YYYY'), 'emp101', 7112, 513);

INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID, DONATION_ID, DELIVERY_ID)
VALUES (8114, 11015, TO_DATE('17-May-2024', 'DD-Mon-YYYY'), 'emp102', 7113, 514);

INSERT INTO INVOICE (INVOICE_NUM, CUSTOMER_ID, INVOICE_DATE, EMPLOYEE_ID, DONATION_ID, DELIVERY_ID)
VALUES (8115, 11011, TO_DATE('17-May-2024', 'DD-Mon-YYYY'), 'emp102', 7115, 515);
```

All Rows Fetched: 6 in 0.01 seconds

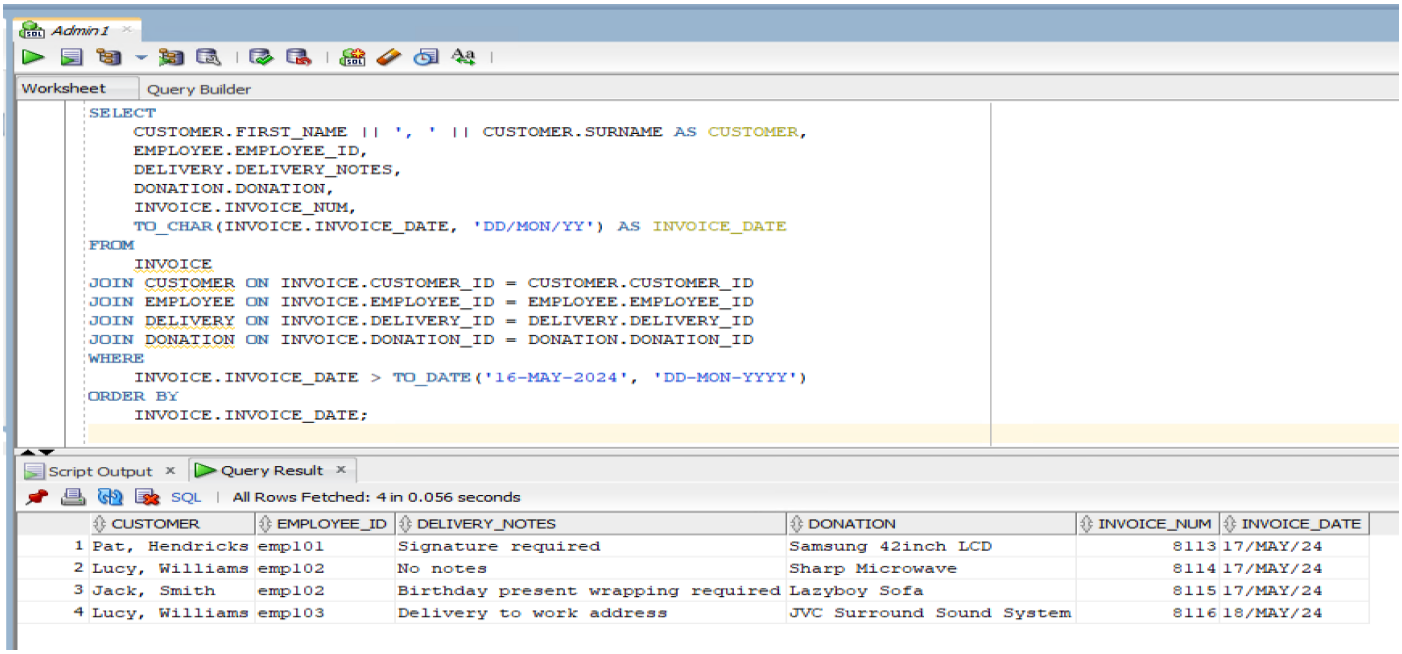
	INVOICE_NUM	CUSTOMER_ID	INVOICE_DATE	EMPLOYEE_ID	DONATION_ID	DELIVERY_ID
1	8111	11011	15-MAY-24	emp103	7111	511
2	8112	11013	15-MAY-24	emp101	7114	512
3	8113	11012	17-MAY-24	emp101	7112	513
4	8114	11015	17-MAY-24	emp102	7113	514
5	8115	11011	17-MAY-24	emp102	7115	515
6	8116	11015	18-MAY-24	emp103	7116	516

QUESTION 2

Code for SQL

```
SELECT
    CUSTOMER.FIRST_NAME || ', ' || CUSTOMER.SURNAME AS CUSTOMER,
    EMPLOYEE.EMPLOYEE_ID,
    DELIVERY.DELIVERY_NOTES,
    DONATION.DONATION,
    INVOICE.INVOICE_NUM,
    TO_CHAR(INVOICE.INVOICE_DATE, 'DD/MON/YY') AS INVOICE_DATE
FROM
    INVOICE
JOIN CUSTOMER ON INVOICE.CUSTOMER_ID = CUSTOMER.CUSTOMER_ID
JOIN EMPLOYEE ON INVOICE.EMPLOYEE_ID = EMPLOYEE.EMPLOYEE_ID
JOIN DELIVERY ON INVOICE.DELIVERY_ID = DELIVERY.DELIVERY_ID
JOIN DONATION ON INVOICE.DONATION_ID = DONATION.DONATION_ID
WHERE
    INVOICE.INVOICE_DATE > TO_DATE('16-MAY-2024', 'DD-MON-YYYY')
ORDER BY
    INVOICE.INVOICE_DATE;
```

Screenshots of executing the Code



QUESTION 3

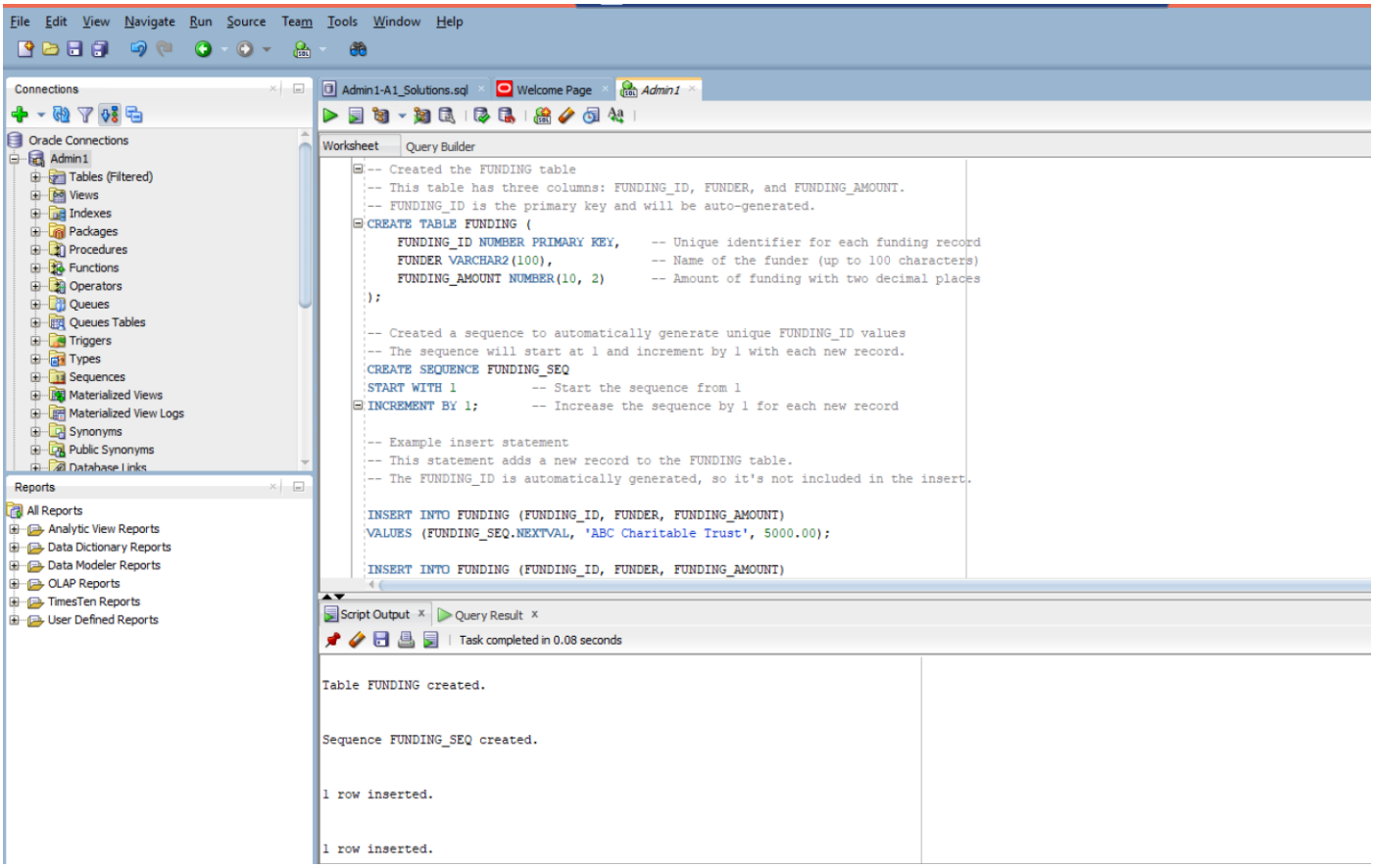
Code for SQL

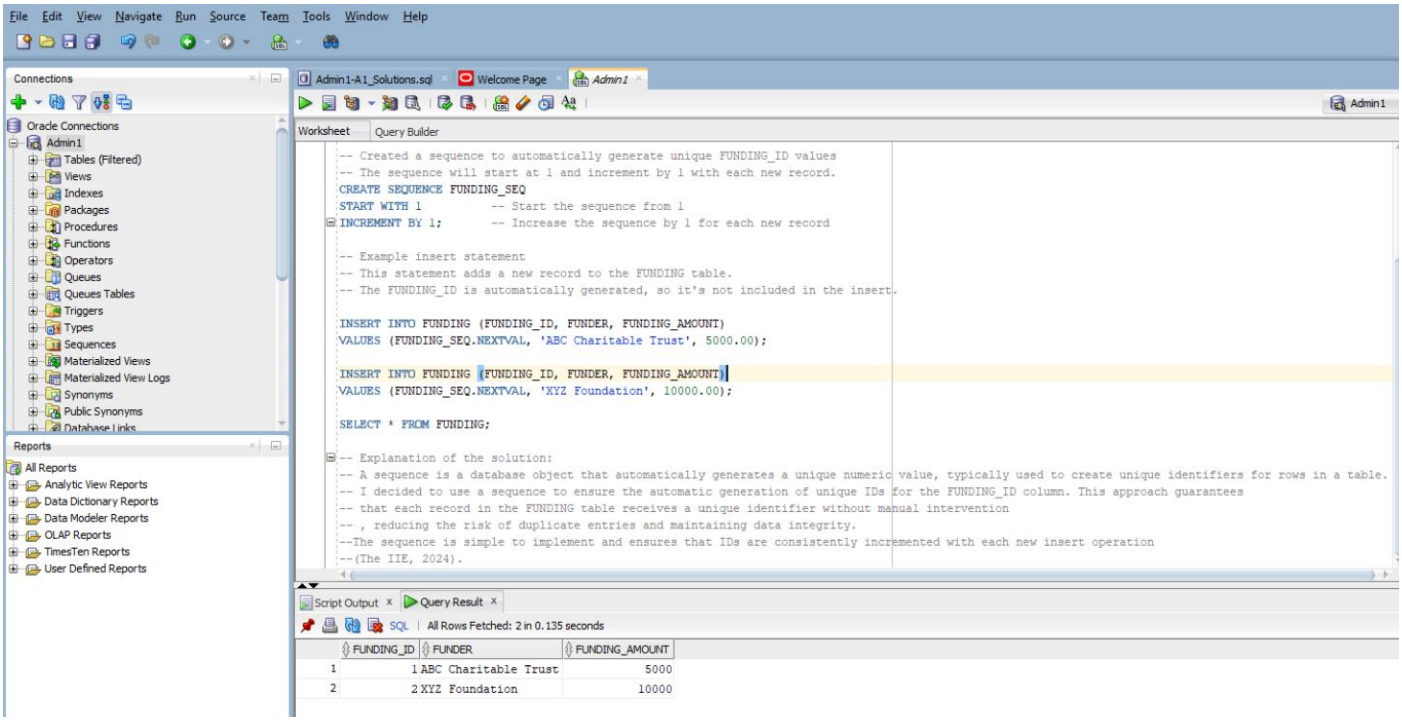
```
-- Created the FUNDING table
-- This table has three columns: FUNDING_ID, FUNDER, and FUNDING_AMOUNT.
-- FUNDING_ID is the primary key and will be auto-generated.
CREATE TABLE FUNDING (
    FUNDING_ID NUMBER PRIMARY KEY,    -- Unique identifier for each funding record
    FUNDER VARCHAR2(100),             -- Name of the funder (up to 100 characters)
    FUNDING_AMOUNT NUMBER(10, 2)      -- Amount of funding with two decimal places
);
-- Created a sequence to automatically generate unique FUNDING_ID values
-- The sequence will start at 1 and increment by 1 with each new record.
CREATE SEQUENCE FUNDING_SEQ
START WITH 1          -- Start the sequence from 1
INCREMENT BY 1;       -- Increase the sequence by 1 for each new record
-- Example insert statement
-- This statement adds a new record to the FUNDING table.
-- The FUNDING_ID is automatically generated, so it's not included in the insert.
INSERT INTO FUNDING (FUNDING_ID, FUNDER, FUNDING_AMOUNT)
VALUES (FUNDING_SEQ.NEXTVAL, 'ABC Charitable Trust', 5000.00);

INSERT INTO FUNDING (FUNDING_ID, FUNDER, FUNDING_AMOUNT)
VALUES (FUNDING_SEQ.NEXTVAL, 'XYZ Foundation', 10000.00);

SELECT * FROM FUNDING;

-- Explanation of the solution:
-- A sequence is a database object that automatically generates a unique numeric value, typically used to create unique identifiers for rows in a table.
-- I decided to use a sequence to ensure the automatic generation of unique IDs for the FUNDING_ID column. This approach guarantees
-- that each record in the FUNDING table receives a unique identifier without manual intervention
-- , reducing the risk of duplicate entries and maintaining data integrity.
```

--The sequence is simple to implement and ensures that IDs are consistently incremented with each new insert operation

--(The IIE, 2024).

Screenshots of executing the Code



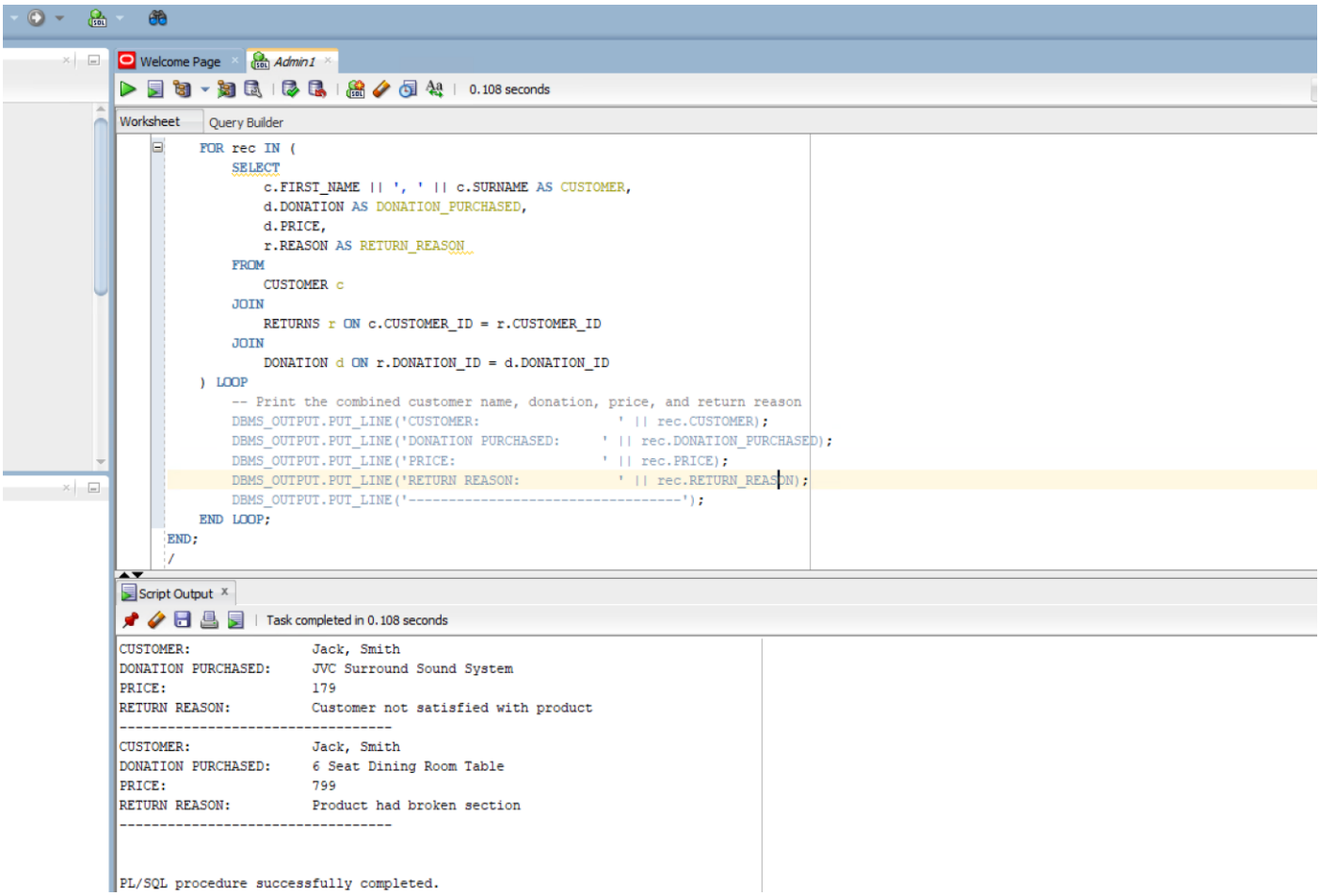


QUESTION 4

Code for SQL

```
SET SERVEROUTPUT ON;
BEGIN
        FOR rec IN (
        SELECT
        c.FIRST_NAME || ', ' || c.SURNAME AS CUSTOMER,
        d.DONATION AS DONATION_PURCHASED,
        d.PRICE,
        r.REASON AS RETURN_REASON
        FROM
        CUSTOMER c
        JOIN
        RETURNS r ON c.CUSTOMER_ID = r.CUSTOMER_ID
        JOIN
        DONATION d ON r.DONATION_ID = d.DONATION_ID
        ) LOOP
        -- Print the combined customer name, donation, price, and return reason
        DBMS_OUTPUT.PUT_LINE('CUSTOMER:          ' || rec.CUSTOMER);
        DBMS_OUTPUT.PUT_LINE('DONATION PURCHASED:    ' ||
rec.DONATION_PURCHASED);
        DBMS_OUTPUT.PUT_LINE('PRICE:             ' || rec.PRICE);
        DBMS_OUTPUT.PUT_LINE('RETURN REASON:         ' || rec.RETURN_REASON);
    DBMS_OUTPUT.PUT_LINE('---------------------------------');
        END LOOP;
END;
/
```

Screenshots of executing the Code



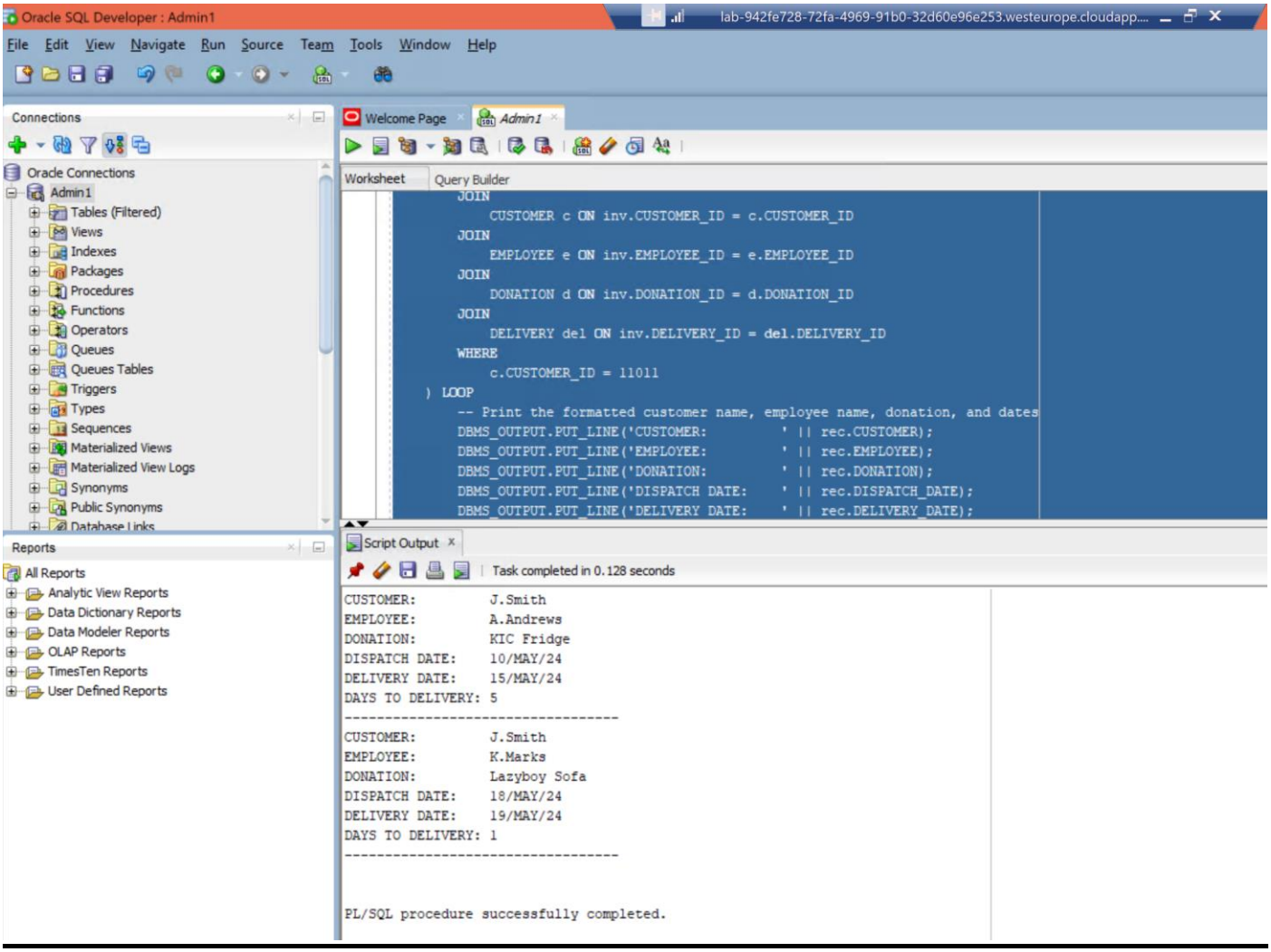
QUESTION 5

Code for SQL

```
SET SERVEROUTPUT ON;
BEGIN
  FOR rec IN (
    SELECT
      SUBSTR(c.FIRST_NAME, 1, 1) || '.' || c.SURNAME AS CUSTOMER,
      SUBSTR(e.FIRST_NAME, 1, 1) || '.' || e.SURNAME AS EMPLOYEE,
      d.DONATION AS DONATION,
      TO_CHAR(del.DISPATCH_DATE, 'DD/MON/YY') AS DISPATCH_DATE,
      TO_CHAR(del.DELIVERY_DATE, 'DD/MON/YY') AS DELIVERY_DATE,
      (del.DELIVERY_DATE - del.DISPATCH_DATE) AS DAYS_TO_DELIVERY
    FROM
      INVOICE inv
    JOIN
      CUSTOMER c ON inv.CUSTOMER_ID = c.CUSTOMER_ID
    JOIN
      EMPLOYEE e ON inv.EMPLOYEE_ID = e.EMPLOYEE_ID
    JOIN
      DONATION d ON inv.DONATION_ID = d.DONATION_ID
    JOIN
      DELIVERY del ON inv.DELIVERY_ID = del.DELIVERY_ID
    WHERE
      c.CUSTOMER_ID = 11011
  ) LOOP
    -- Print the formatted customer name, employee name, donation, and dates
    DBMS_OUTPUT.PUT_LINE('CUSTOMER:       ' || rec.CUSTOMER);
    DBMS_OUTPUT.PUT_LINE('EMPLOYEE:       ' || rec.EMPLOYEE);
    DBMS_OUTPUT.PUT_LINE('DONATION:       ' || rec.DONATION);
    DBMS_OUTPUT.PUT_LINE('DISPATCH DATE:  ' || rec.DISPATCH_DATE);
    DBMS_OUTPUT.PUT_LINE('DELIVERY DATE:  ' || rec.DELIVERY_DATE);
    DBMS_OUTPUT.PUT_LINE('DAYS TO DELIVERY: ' || rec.DAYS_TO_DELIVERY);
```

```
    DBMS_OUTPUT.PUT_LINE('---------------------------------');
  END LOOP;
END;
/
```

Screenshots of executing the Code

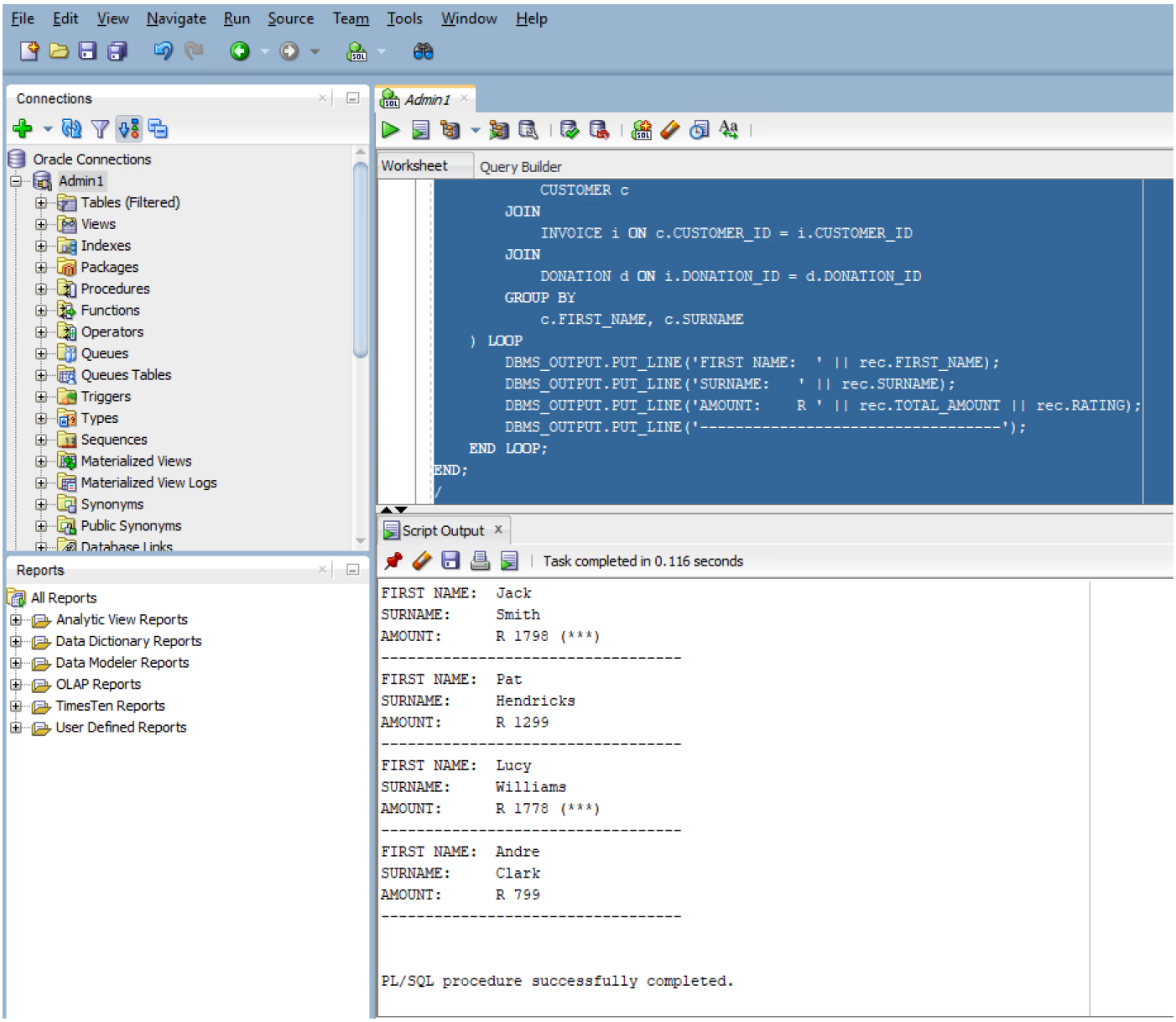


QUESTION 6

Code for SQL

```
SET SERVEROUTPUT ON;
BEGIN
        FOR rec IN (
        SELECT
        c.FIRST_NAME,
        c.SURNAME,
        SUM(d.PRICE) AS TOTAL_AMOUNT,
        CASE
        WHEN SUM(d.PRICE) >= 1500 THEN ' (***)'
        ELSE ''
        END AS RATING
        FROM
        CUSTOMER c
        JOIN
        INVOICE i ON c.CUSTOMER_ID = i.CUSTOMER_ID
        JOIN
        DONATION d ON i.DONATION_ID = d.DONATION_ID
        GROUP BY
        c.FIRST_NAME, c.SURNAME
        ) LOOP
        DBMS_OUTPUT.PUT_LINE('FIRST NAME:  ' || rec.FIRST_NAME);
        DBMS_OUTPUT.PUT_LINE('SURNAME:          ' || rec.SURNAME);
        DBMS_OUTPUT.PUT_LINE('AMOUNT:    R ' || rec.TOTAL_AMOUNT || rec.RATING);
    DBMS_OUTPUT.PUT_LINE('---------------------------------');
        END LOOP;
END;
/
```

Screenshots of executing the Code



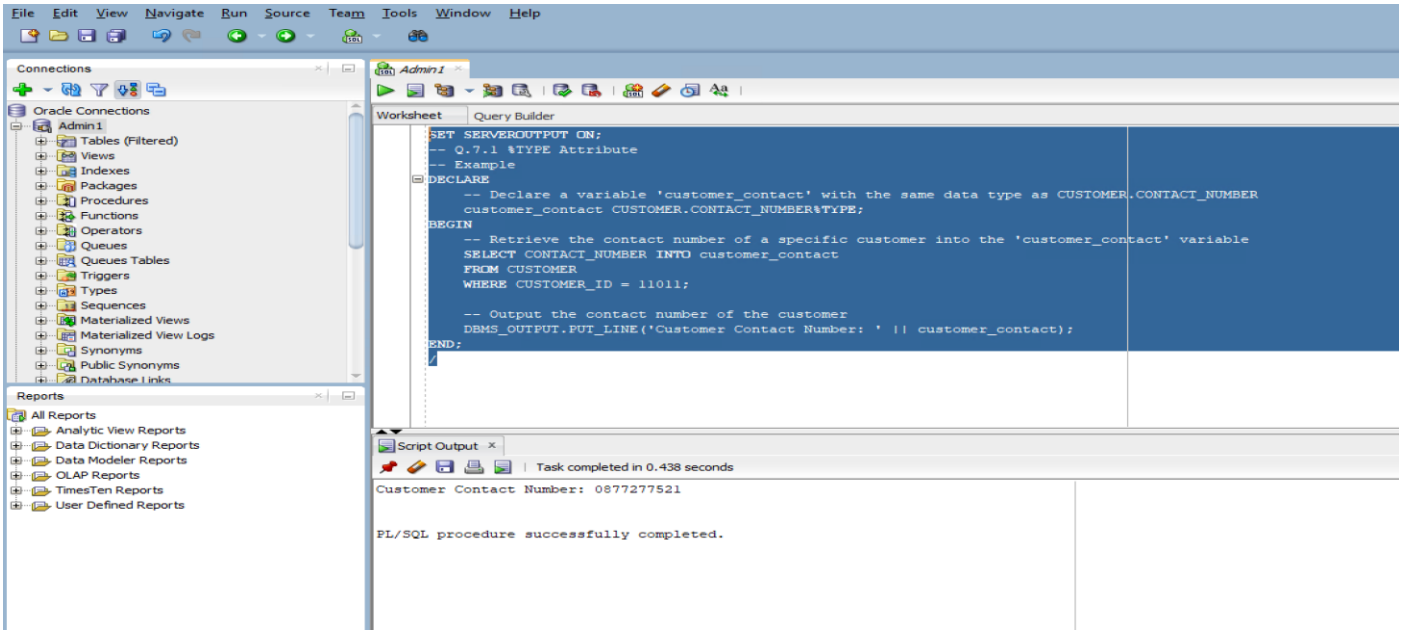
QUESTION 7

Q.7.1)

Code for SQL

```
SET SERVEROUTPUT ON;

-- Q.7.1 %TYPE Attribute

-- Example

DECLARE

        -- Declare a variable 'customer_contact' with the same data type as CUSTOMER.CONTACT_NUMBER

        customer_contact CUSTOMER.CONTACT_NUMBER%TYPE;

BEGIN

        -- Retrieve the contact number of a specific customer into the 'customer_contact' variable

        SELECT CONTACT_NUMBER INTO customer_contact

        FROM CUSTOMER

        WHERE CUSTOMER_ID = 11011;


        -- Output the contact number of the customer

        DBMS_OUTPUT.PUT_LINE('Customer Contact Number: ' || customer_contact);

END;

/
```

Screenshots of executing the Code



Explanation

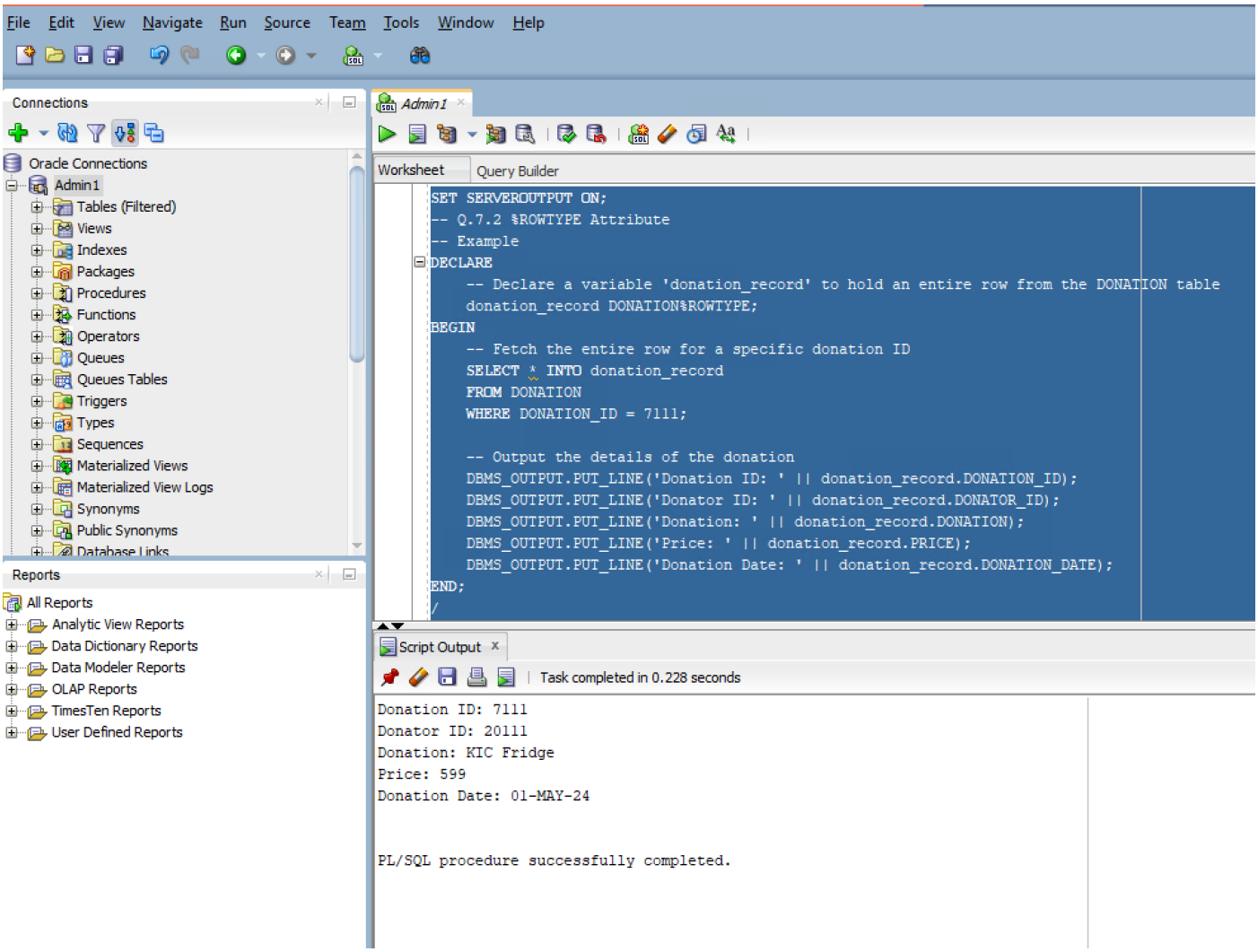
The %TYPE attribute in PL/SQL is used to declare a variable with the same data type as an existing database column or another variable. In this example, customer_contact is declared using the %TYPE attribute, inheriting the data type from the CONTACT_NUMBER column of the CUSTOMER table. This ensures that if the data type of CONTACT_NUMBER changes in the future, the variable will automatically adapt without requiring changes in the PL/SQL code (The IIE, 2024).

Q.7.2)

Code for SQL

```
SET SERVEROUTPUT ON;

-- Q.7.2 %ROWTYPE Attribute

-- Example

DECLARE

        -- Declare a variable 'donation_record' to hold an entire row from the DONATION table

        donation_record DONATION%ROWTYPE;

BEGIN

        -- Fetch the entire row for a specific donation ID

        SELECT * INTO donation_record

        FROM DONATION

        WHERE DONATION_ID = 7111;


        -- Output the details of the donation

        DBMS_OUTPUT.PUT_LINE('Donation ID: ' || donation_record.DONATION_ID);

        DBMS_OUTPUT.PUT_LINE('Donator ID: ' || donation_record.DONATOR_ID);

        DBMS_OUTPUT.PUT_LINE('Donation: ' || donation_record.DONATION);

        DBMS_OUTPUT.PUT_LINE('Price: ' || donation_record.PRICE);

        DBMS_OUTPUT.PUT_LINE('Donation Date: ' || donation_record.DONATION_DATE);

END;

/
```

Screenshots of executing the Code



Explanation

The %ROWTYPE attribute in PL/SQL is used to declare a record variable that matches the structure (i.e., the columns and their data types) of a table or a cursor. The variable donation_record is declared using %ROWTYPE, meaning it can hold all the column values from a single row in the DONATION table. This allows us to fetch and display all the relevant details of the donation in a single select statement (The IIE, 2024).

Q.7.3)

Code for SQL

SET SERVEROUTPUT ON;

-- Set server output on to display output

SET SERVEROUTPUT ON;

DECLARE

-- Declare variables

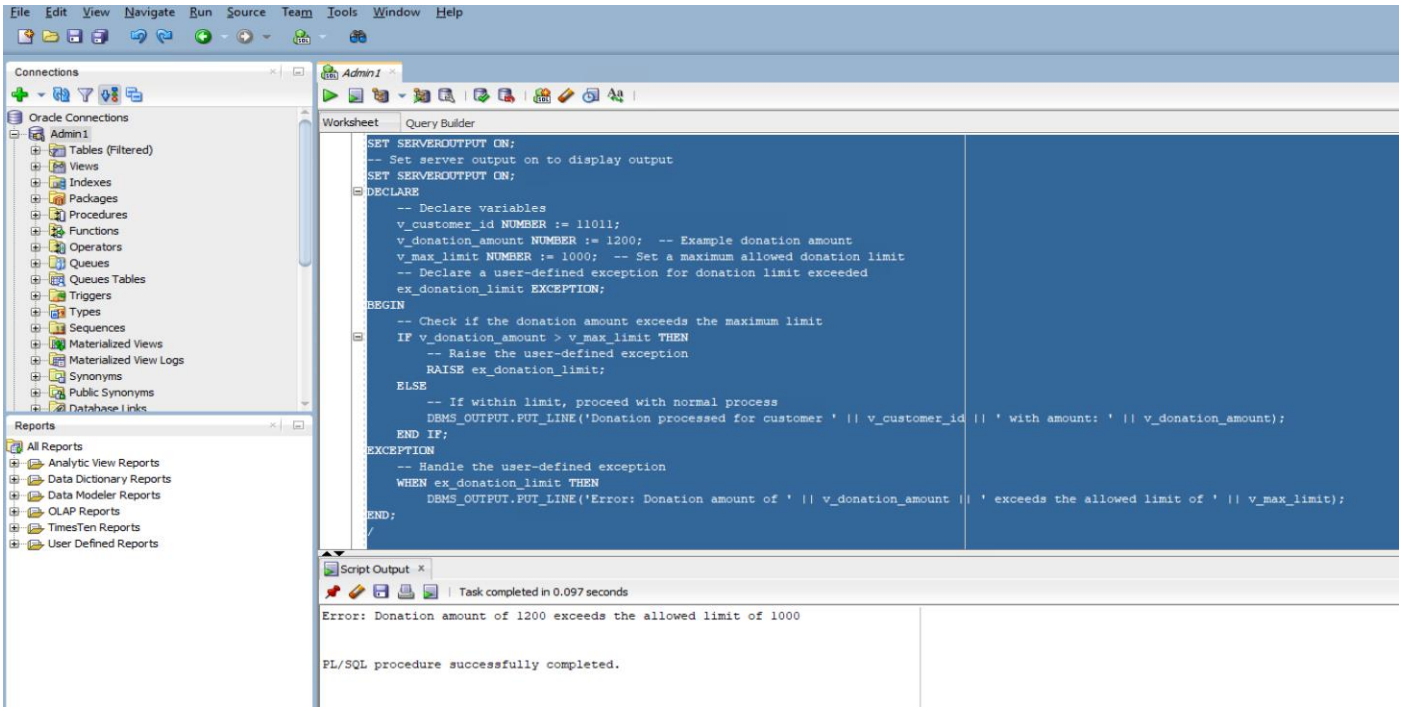
v_customer_id NUMBER := 11011;

v_donation_amount NUMBER := 1200; -- Example donation amount

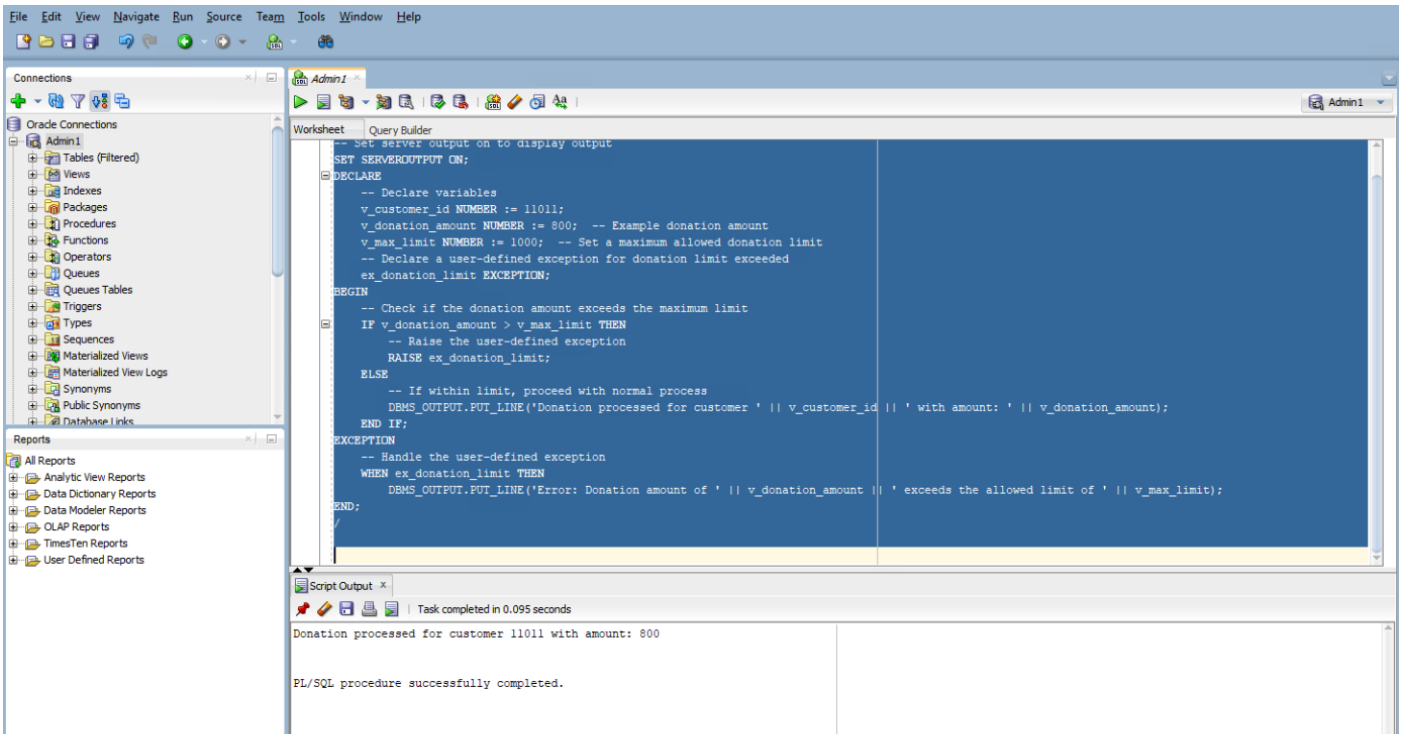
```
    v_max_limit NUMBER := 1000;  -- Set a maximum allowed donation limit
    -- Declare a user-defined exception for donation limit exceeded
    ex_donation_limit EXCEPTION;
BEGIN
    -- Check if the donation amount exceeds the maximum limit
    IF v_donation_amount > v_max_limit THEN
        -- Raise the user-defined exception
        RAISE ex_donation_limit;
    ELSE
        -- If within limit, proceed with normal process
        DBMS_OUTPUT.PUT_LINE('Donation processed for customer ' || v_customer_id || ' with amount: ' ||
v_donation_amount);
    END IF;
EXCEPTION
    -- Handle the user-defined exception
    WHEN ex_donation_limit THEN
        DBMS_OUTPUT.PUT_LINE('Error: Donation amount of ' || v_donation_amount || ' exceeds the
allowed limit of ' || v_max_limit);
END;
/
```

Screenshots of executing the Code

If donation amount exceeds the limit:



If donation amount is within the limit (e.g., set v_donation_amount := 800)



Explanation

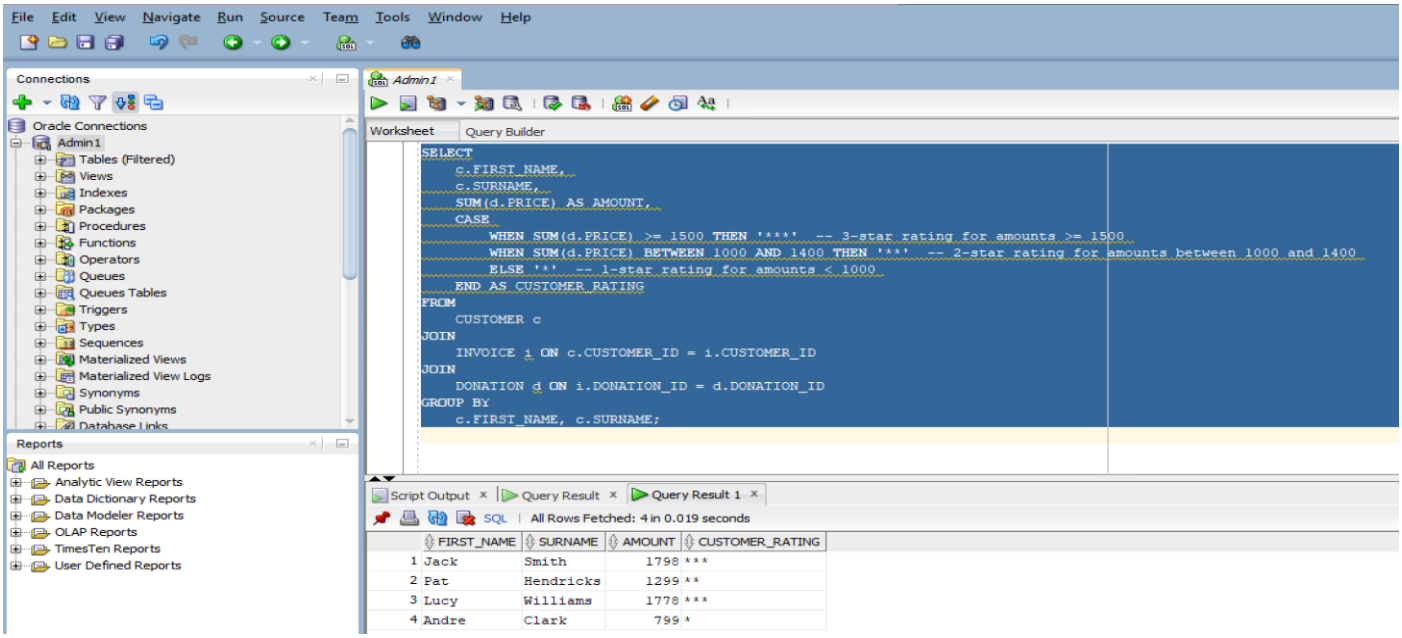
A user-defined exception in PL/SQL allows you to create and handle custom error conditions specific to your application's logic. A user-defined exception ex_donation_limit is declared. The code checks if the donation amount exceeds the defined limit. If it does, the exception is raised and handled with a custom error message. If the amount is within the limit, a success message is displayed (The IIE, 2024).

QUESTION 8

Code for SQL

```
SELECT
        c.FIRST_NAME,
        c.SURNAME,
        SUM(d.PRICE) AS AMOUNT,
        CASE
        WHEN SUM(d.PRICE) >= 1500 THEN '***'  -- 3-star rating for amounts >= 1500
        WHEN SUM(d.PRICE) BETWEEN 1000 AND 1400 THEN '**'  -- 2-star rating for amounts between 1000 and 1400
        ELSE '*'  -- 1-star rating for amounts < 1000
        END AS CUSTOMER_RATING
FROM
        CUSTOMER c
JOIN
        INVOICE i ON c.CUSTOMER_ID = i.CUSTOMER_ID
JOIN
        DONATION d ON i.DONATION_ID = d.DONATION_ID
GROUP BY
        c.FIRST_NAME, c.SURNAME;
```

Screenshots of executing the Code



REFERENCE LIST

The IIE. 2024. Databases Advanced Databases Module Manual 2024, 1st ed. The IIE.