CTU 2024

Software Development

SUBJECT NAME: Business Programming Semester 2

SUBJECT CODE: PRG522 FA 3

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19th May 2024:

Scenario Question.

Question

Transforming Nicky Motors database

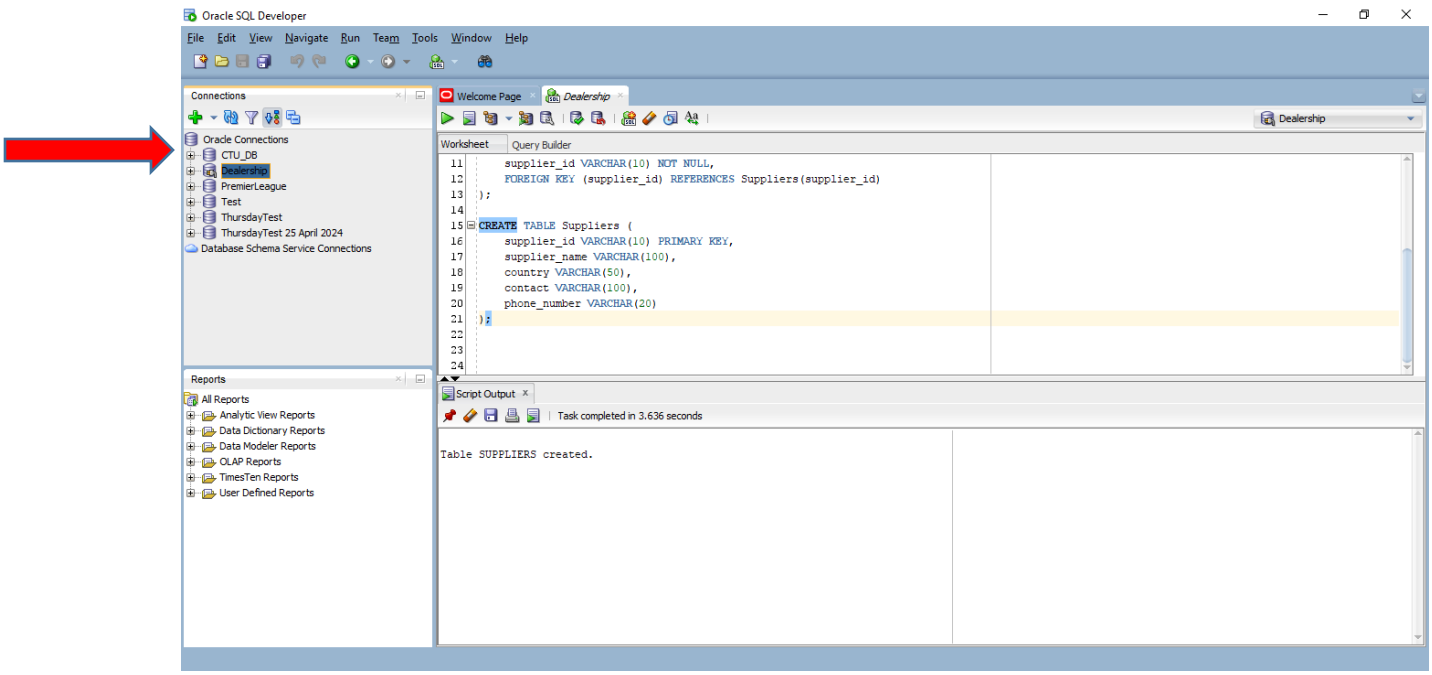
Below is data extracted from the dealership's products table

Question 1.

This task includes preparing the data

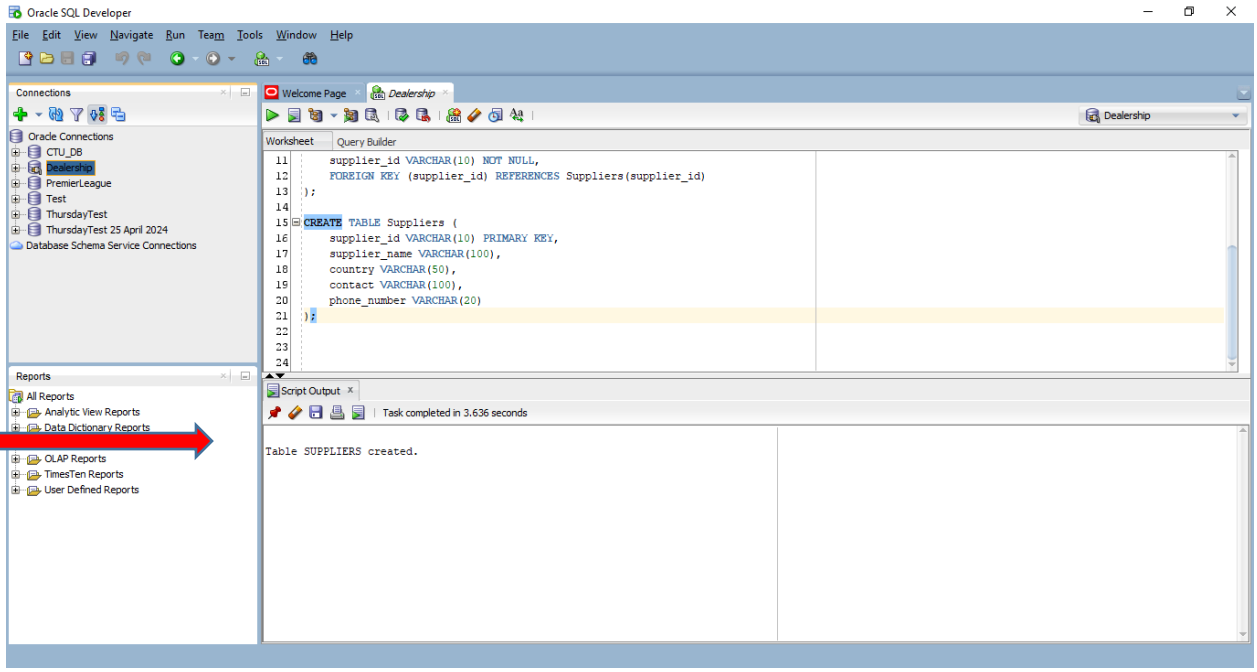
1.1 On Oracle, write SQL statements to create a database for Nicky Motors called "dealership"

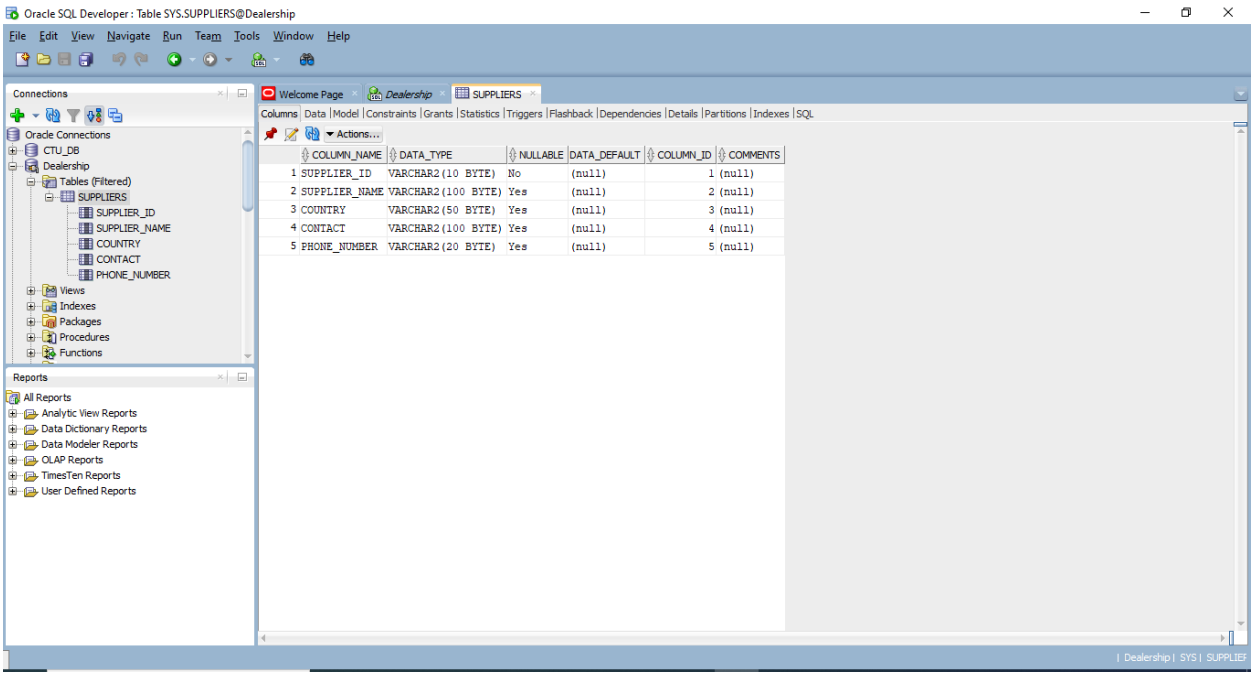
Dealership data created

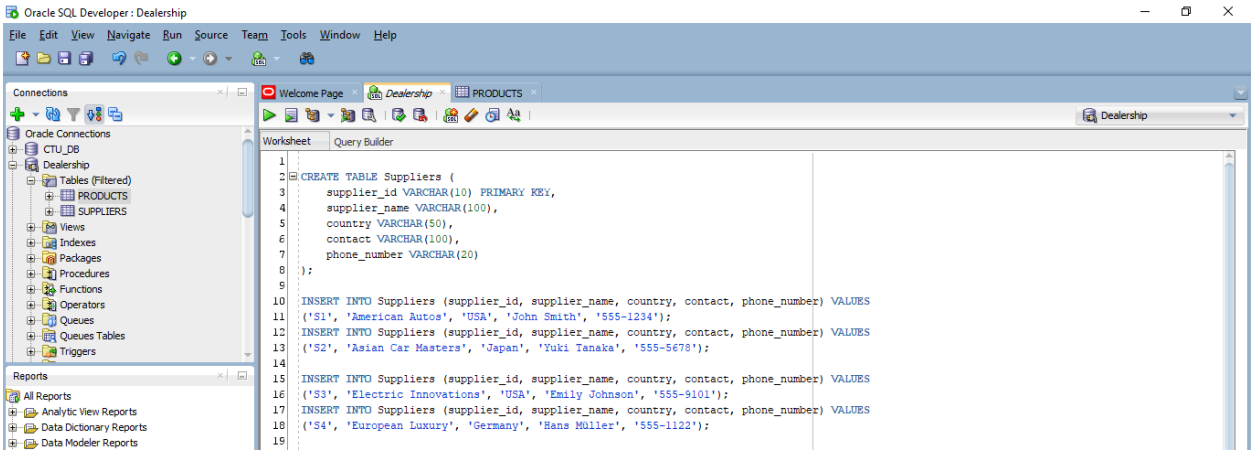


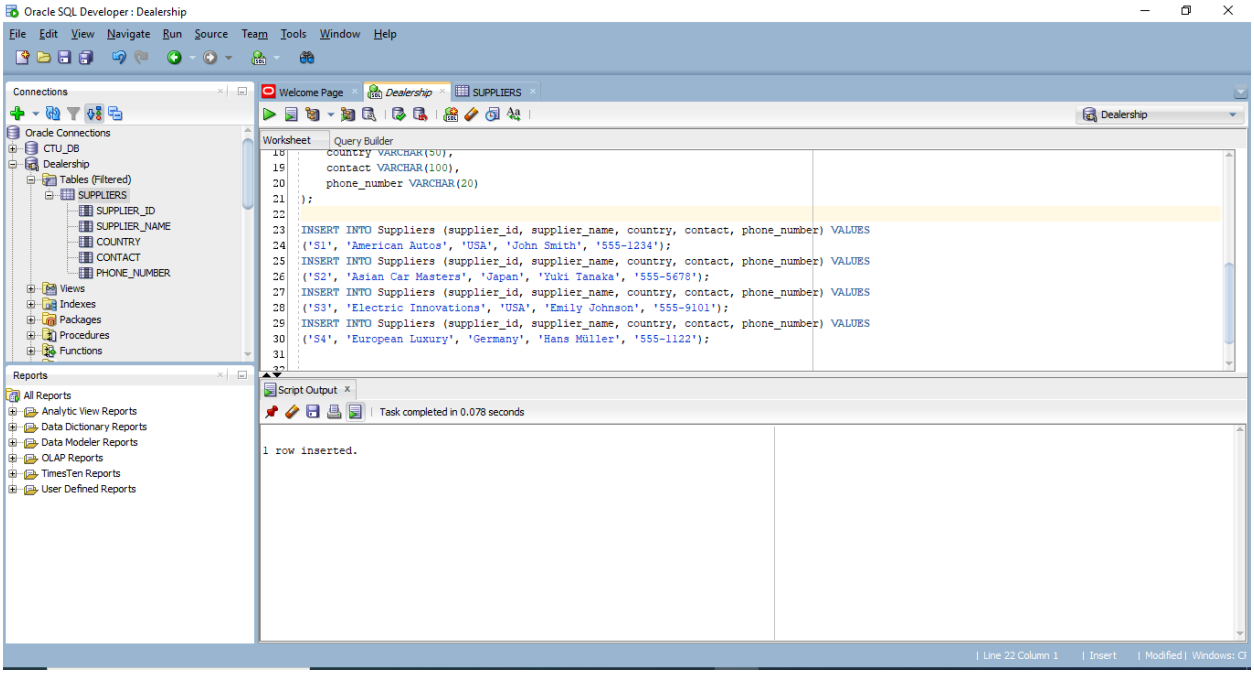
1.2 Write SQL statements that will recreate the product table for Nicky Motors, this table should include an additional column called "Supplier ID" which has a foreign key and the data cannot be null. ()

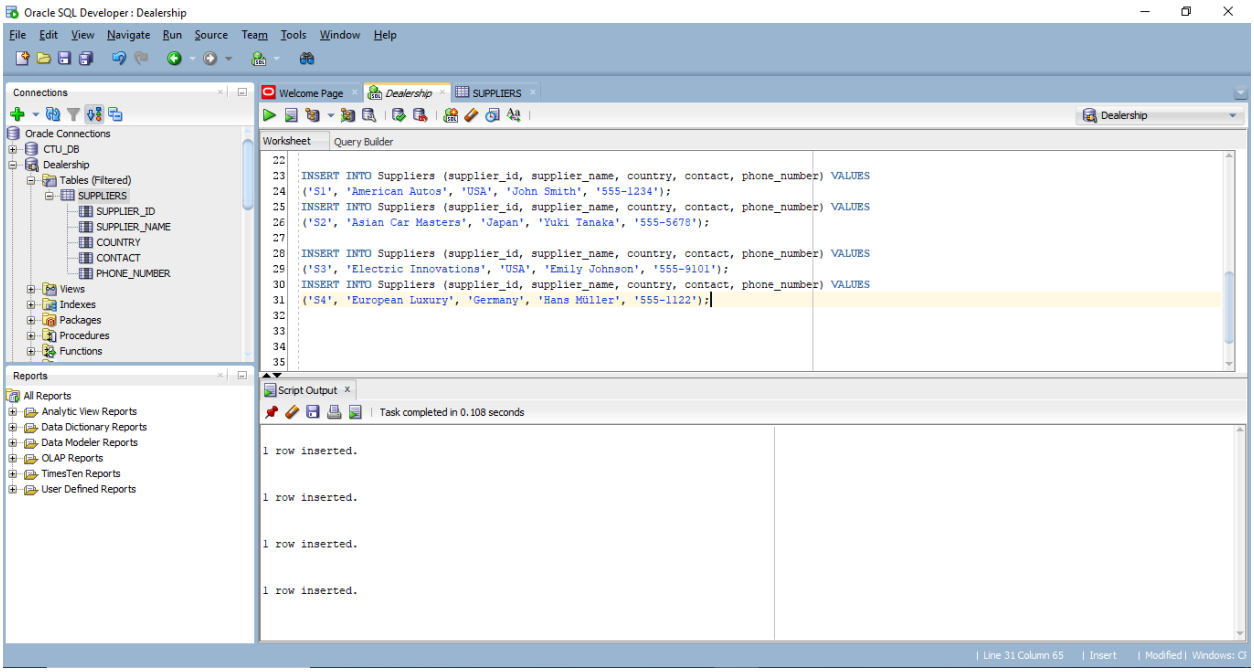
Supplier ID created

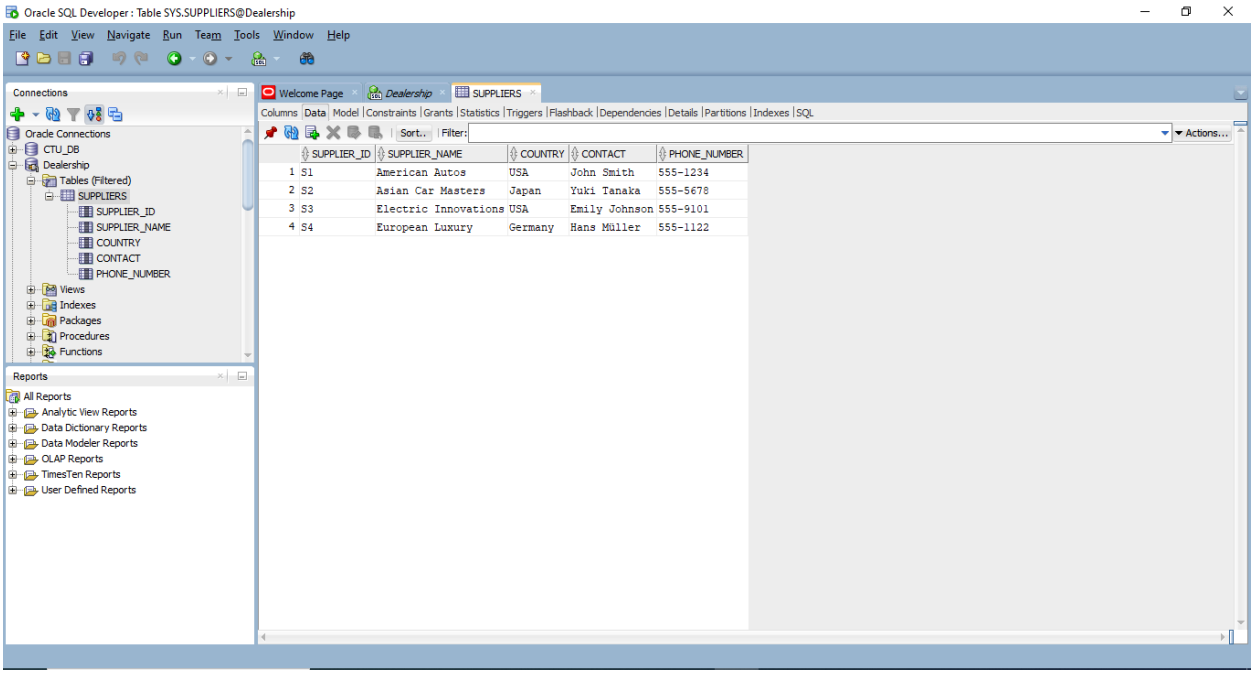





Oracle SQL Developer : Dealership
File Edit View Navigate Run Source Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views
Indexes
Packages
Procedures
Functions
Operators
Queues
Queues Tables
Triggers
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
Welcome Page
Dealership
PRODUCTS
Worksheet
Query Builder
CREATE TABLE Suppliers (
supplier_id VARCHAR(10) PRIMARY KEY,
supplier_name VARCHAR(100),
country VARCHAR(50),
contact VARCHAR(100),
phone_number VARCHAR(20)
);
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S1', 'American Autos', 'USA', 'John Smith', '555-1234');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S2', 'Asian Car Masters', 'Japan', 'Yuki Tanaka', '555-5678');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S3', 'Electric Innovations', 'USA', 'Emily Johnson', '555-9101');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S4', 'European Luxury', 'Germany', 'Hans Müller', '555-1122');


Oracle SQL Developer : Dealership
File Edit View Navigate Run Source Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
SUPPLIERS
SUPPLIER_ID
SUPPLIER_NAME
COUNTRY
CONTACT
PHONE_NUMBER
Views
Indexes
Packages
Procedures
Functions
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
SUPPLIERS
Worksheet
Query Builder
country VARCHAR(50),
contact VARCHAR(100),
phone_number VARCHAR(20)
);
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S1', 'American Autos', 'USA', 'John Smith', '555-1234');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S2', 'Asian Car Masters', 'Japan', 'Yuki Tanaka', '555-5678');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S3', 'Electric Innovations', 'USA', 'Emily Johnson', '555-9101');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S4', 'European Luxury', 'Germany', 'Hans Müller', '555-1122');
Script Output
Task completed in 0.078 seconds
1 row inserted.
Line 22 Column 1
Insert
Modified
Windows: Cr


Oracle SQL Developer : Dealership
File Edit View Navigate Run Source Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
SUPPLIERS
SUPPLIER_ID
SUPPLIER_NAME
COUNTRY
CONTACT
PHONE_NUMBER
Views
Indexes
Packages
Procedures
Functions
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
SUPPLIERS
Worksheet
Query Builder
22
23 INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
24 ('S1', 'American Autos', 'USA', 'John Smith', '555-1234');
25 INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
26 ('S2', 'Asian Car Masters', 'Japan', 'Yuki Tanaka', '555-5678');
27
28 INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
29 ('S3', 'Electric Innovations', 'USA', 'Emily Johnson', '555-9101');
30 INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
31 ('S4', 'European Luxury', 'Germany', 'Hans Müller', '555-1122');
32
33
34
35
Script Output
Task completed in 0.108 seconds
1 row inserted.
1 row inserted.
1 row inserted.
1 row inserted.
Line 31 Column 65
Insert
Modified
Windows: CI


Oracle SQL Developer : Table SYS.SUPPLIERS@Dealership
File Edit View Navigate Run Team Tools Window Help
Connections
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CTU_DB
Dealership
Tables (Filtered)
SUPPLIERS
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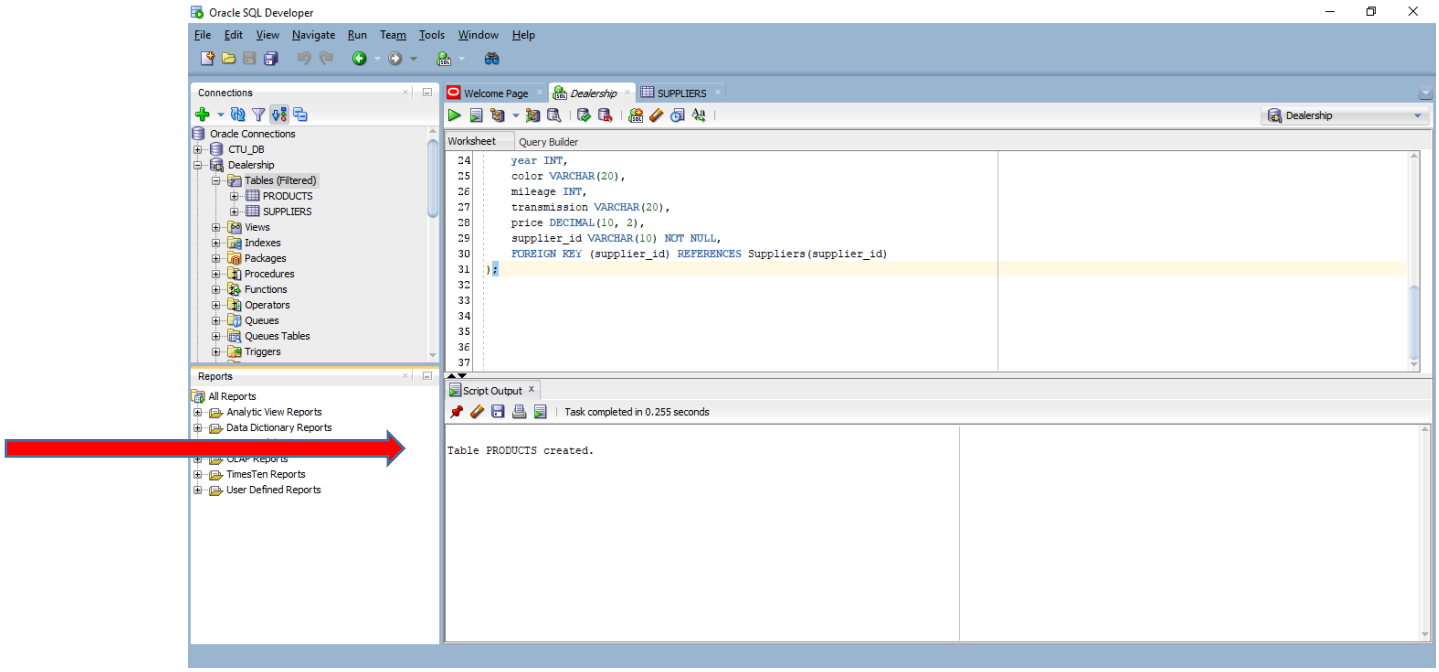
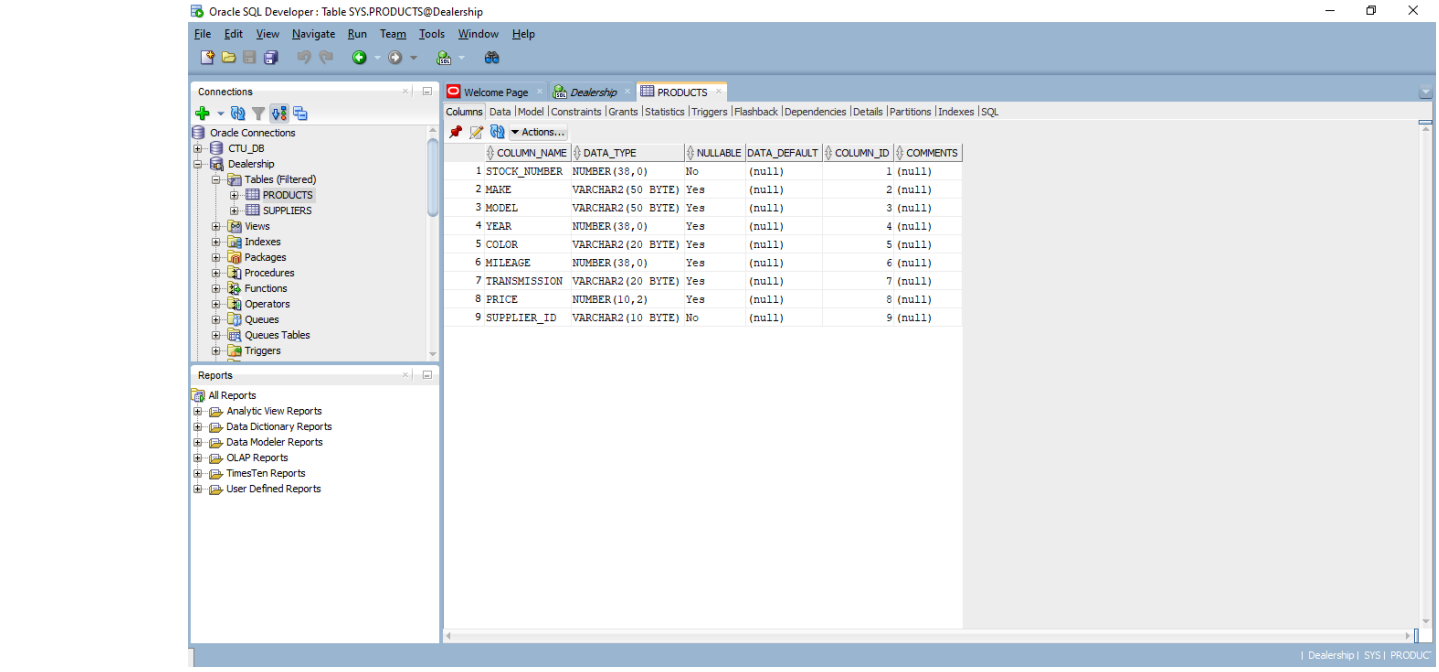
COUNTRY
CONTACT
PHONE_NUMBER
Views
Indexes
Packages
Procedures
Functions
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
SUPPLIERS
Columns Data Model Constraints Grants Statistics Triggers Flashback Dependencies Details Partitions Indexes SQL
Sort...
Filter:
Actions...
SUPPLIER_ID SUPPLIER_NAME COUNTRY CONTACT PHONE_NUMBER
1 S1 American Autos USA John Smith 555-1234
2 S2 Asian Car Masters Japan Yuki Tanaka 555-5678
3 S3 Electric Innovations USA Emily Johnson 555-9101
4 S4 European Luxury Germany Hans Müller 555-1122

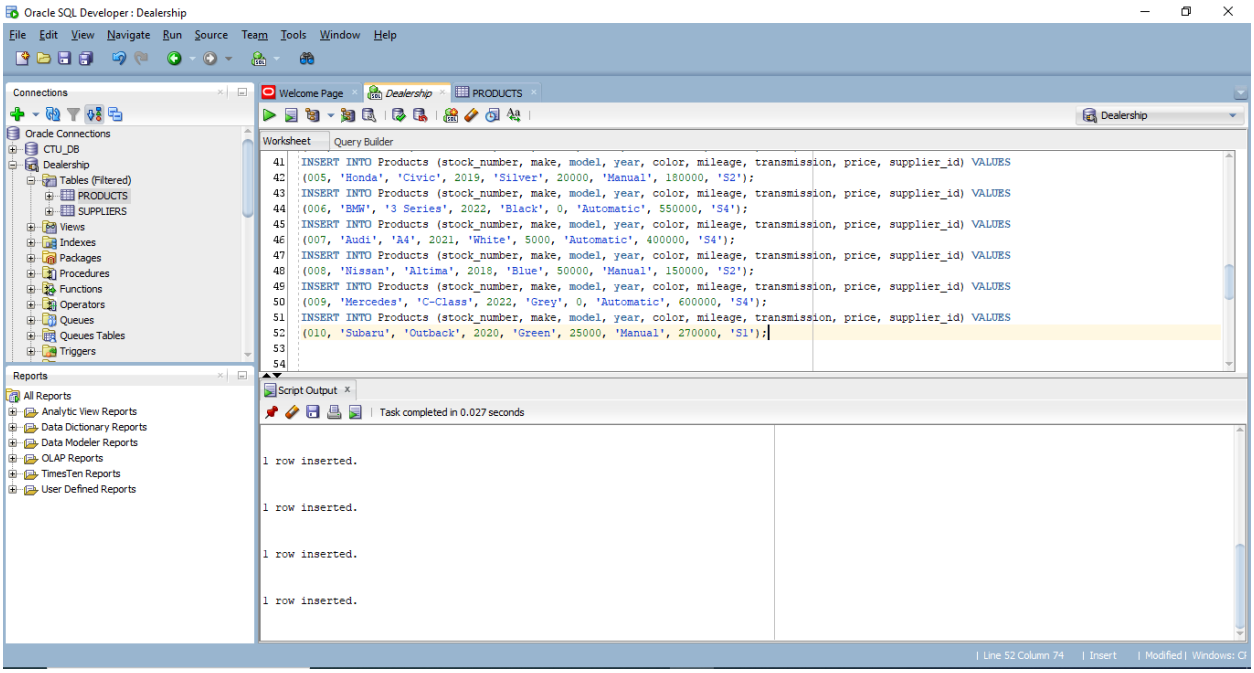
Code

```
CREATE TABLE Suppliers (
   supplier_id VARCHAR(10) PRIMARY KEY,
   supplier_name VARCHAR(100),
   country VARCHAR(50),
   contact VARCHAR(100),
   phone_number VARCHAR(20)
);

INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S1', 'American Autos', 'USA', 'John Smith', '555-1234');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S2', 'Asian Car Masters', 'Japan', 'Yuki Tanaka', '555-5678');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S3', 'Electric Innovations', 'USA', 'Emily Johnson', '555-9101');
INSERT INTO Suppliers (supplier_id, supplier_name, country, contact, phone_number) VALUES
('S4', 'European Luxury', 'Germany', 'Hans Müller', '555-1122');
```

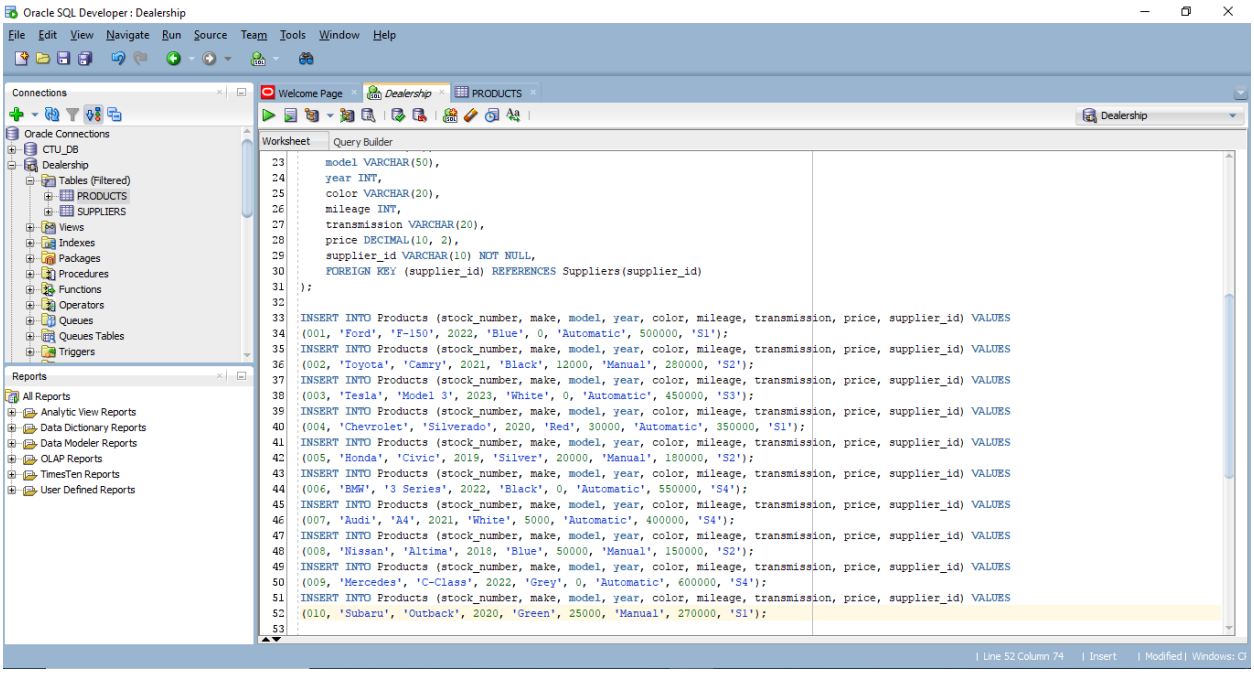
Products table created

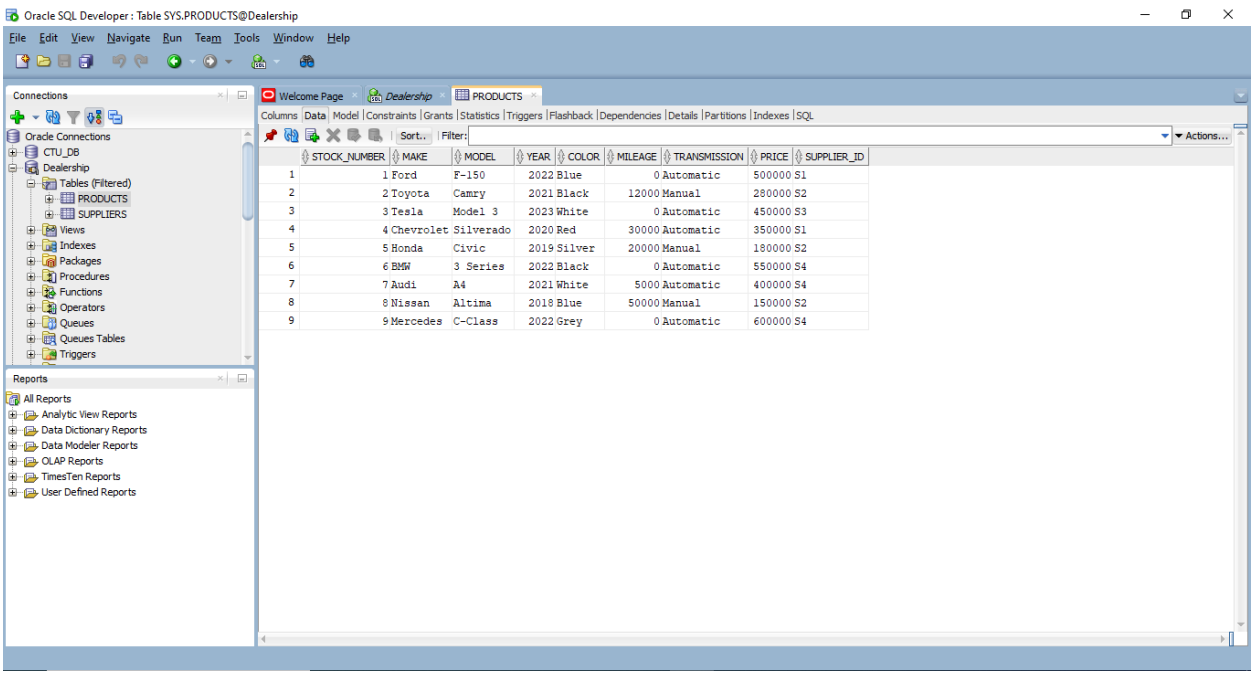

Oracle SQL Developer
File Edit View Navigate Run Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views
Indexes
Packages
Procedures
Functions
Operators
Queues
Queues Tables
Triggers
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
SUPPLIERS
Worksheet
Query Builder
year INT,
color VARCHAR(20),
mileage INT,
transmission VARCHAR(20),
price DECIMAL(10, 2),
supplier_id VARCHAR(10) NOT NULL,
FOREIGN KEY (supplier_id) REFERENCES Suppliers(supplier_id)
);
Script Output
Task completed in 0.255 seconds
Table PRODUCTS created.


Oracle SQL Developer : Table SYS.PRODUCTS@Dealership
File Edit View Navigate Run Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views
Indexes
Packages
Procedures
Functions
Operators
Queues
Queues Tables
Triggers
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
PRODUCTS
Columns Data Model Constraints Grants Statistics Triggers Flashback Dependencies Details Partitions Indexes SQL
Actions...
COLUMN_NAME DATA_TYPE NULLABLE DATA_DEFAULT COLUMN_ID COMMENTS
1 STOCK_NUMBER NUMBER(38,0) No (null) 1 (null)
2 MAKE VARCHAR2(50 BYTE) Yes (null) 2 (null)
3 MODEL VARCHAR2(50 BYTE) Yes (null) 3 (null)
4 YEAR NUMBER(38,0) Yes (null) 4 (null)
5 COLOR VARCHAR2(20 BYTE) Yes (null) 5 (null)
6 MILEAGE NUMBER(38,0) Yes (null) 6 (null)
7 TRANSMISSION VARCHAR2(20 BYTE) Yes (null) 7 (null)
8 PRICE NUMBER(10,2) Yes (null) 8 (null)
9 SUPPLIER_ID VARCHAR2(10 BYTE) No (null) 9 (null)
| Dealership | SYS | PRODUC



Screen shot of the code on SQL Developer





Code

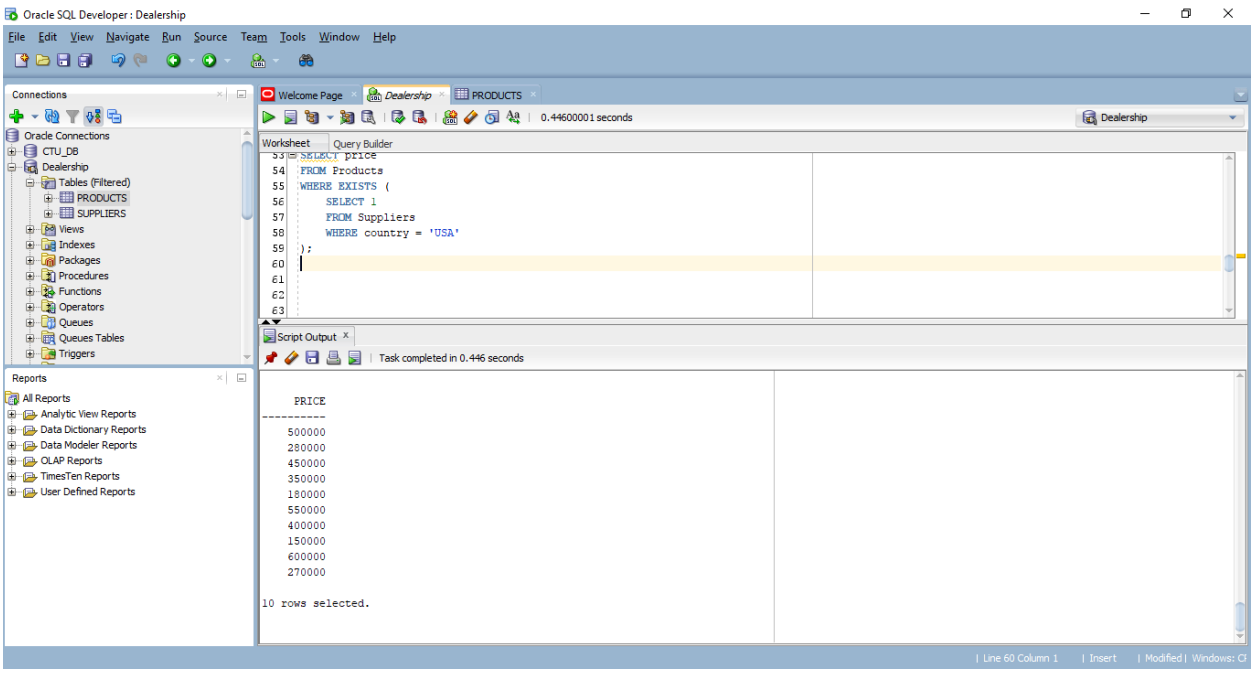
```
CREATE TABLE Products (
    stock_number INT PRIMARY KEY,
    make VARCHAR(50),
    model VARCHAR(50),
    year INT,
    color VARCHAR(20),
    mileage INT,
    transmission VARCHAR(20),
    price DECIMAL(10, 2),
    supplier_id VARCHAR(10) NOT NULL,
    FOREIGN KEY (supplier_id) REFERENCES Suppliers(supplier_id)
);
```

```
INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(001, 'Ford', 'F-150', 2022, 'Blue', 0, 'Automatic', 500000, 'S1');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(002, 'Toyota', 'Camry', 2021, 'Black', 12000, 'Manual', 280000, 'S2');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(003, 'Tesla', 'Model 3', 2023, 'White', 0, 'Automatic', 450000, 'S3');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(004, 'Chevrolet', 'Silverado', 2020, 'Red', 30000, 'Automatic', 350000, 'S1');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(005, 'Honda', 'Civic', 2019, 'Silver', 20000, 'Manual', 180000, 'S2');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(006, 'BMW', '3 Series', 2022, 'Black', 0, 'Automatic', 550000, 'S4');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(007, 'Audi', 'A4', 2021, 'White', 5000, 'Automatic', 400000, 'S4');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(008, 'Nissan', 'Altima', 2018, 'Blue', 50000, 'Manual', 150000, 'S2');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(009, 'Mercedes', 'C-Class', 2022, 'Grey', 0, 'Automatic', 600000, 'S4');

INSERT INTO Products (stock_number, make, model, year, color, mileage, transmission, price, supplier_id) VALUES

(010, 'Subaru', 'Outback', 2020, 'Green', 25000, 'Manual', 270000, 'S1');
```

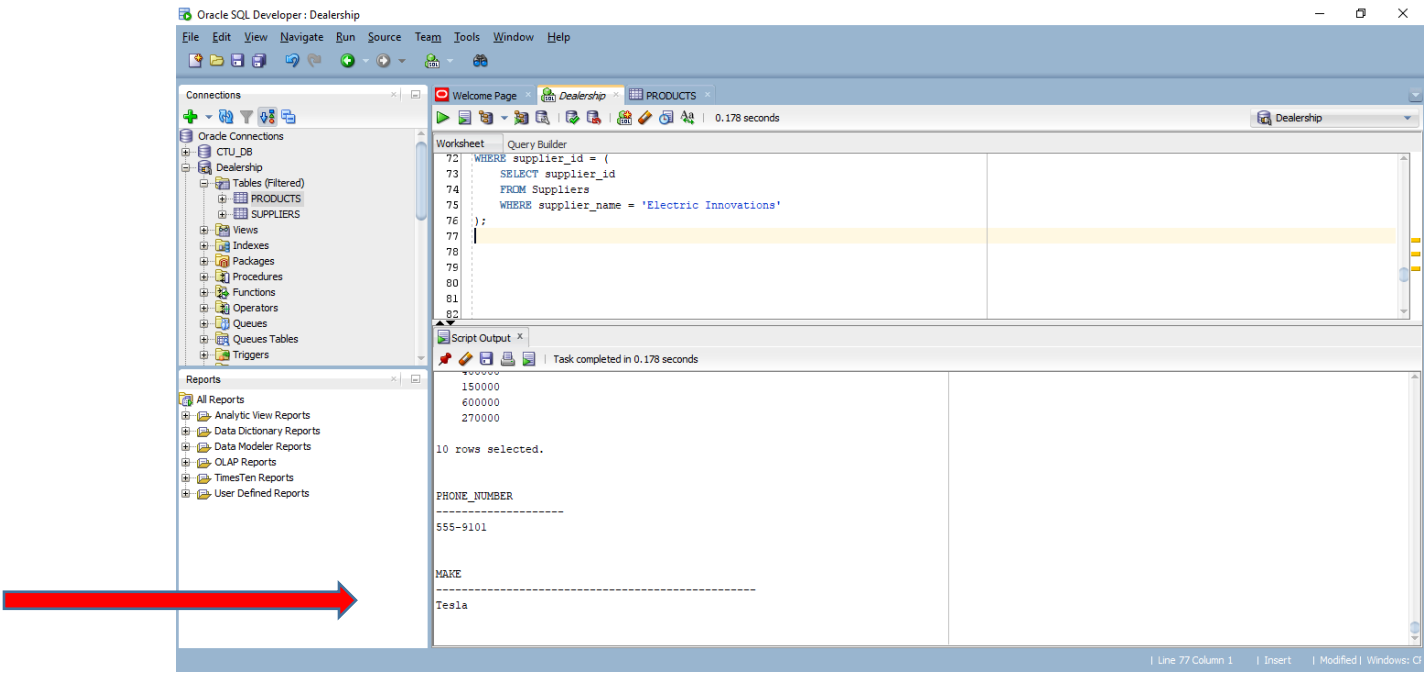
Question 2

This task includes learning unit 9: Using subqueries to solve queries. Write SQL statements to perform the following subqueries:

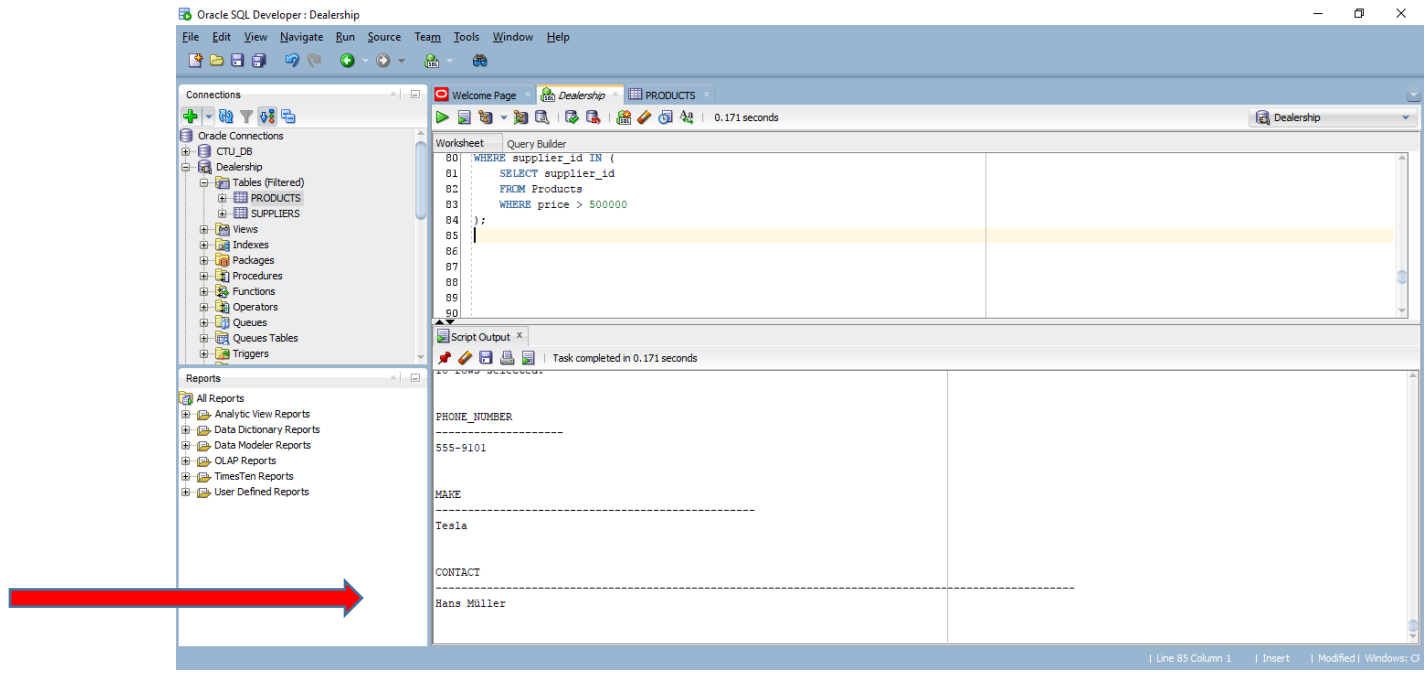
2.1 Display the price of a product if ANY records on the supplier table are from the USA (7 Marks)



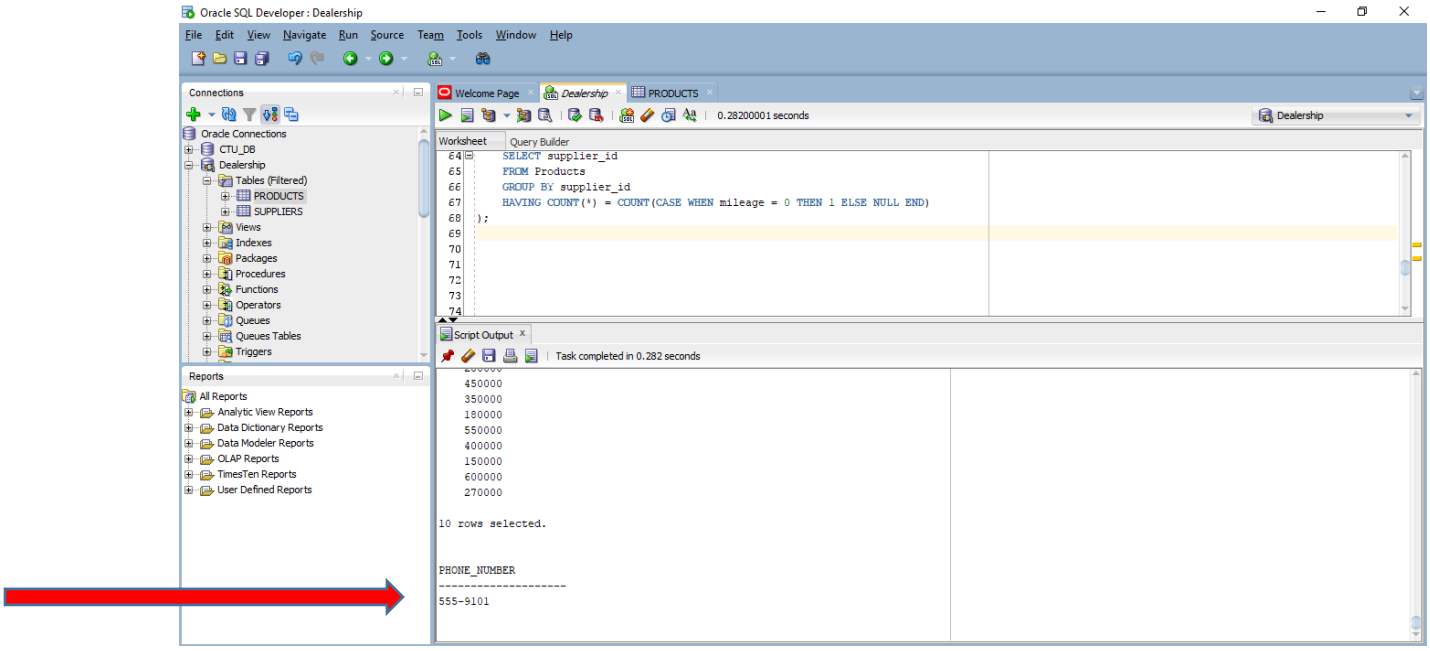
2.2 Display the make of a product if ANY records on the supplier table are supplied by Electric Innovations.



2.3 Display the contact of the supplier if ANY records on the products table have a price greater than 500,000.



Display contact details



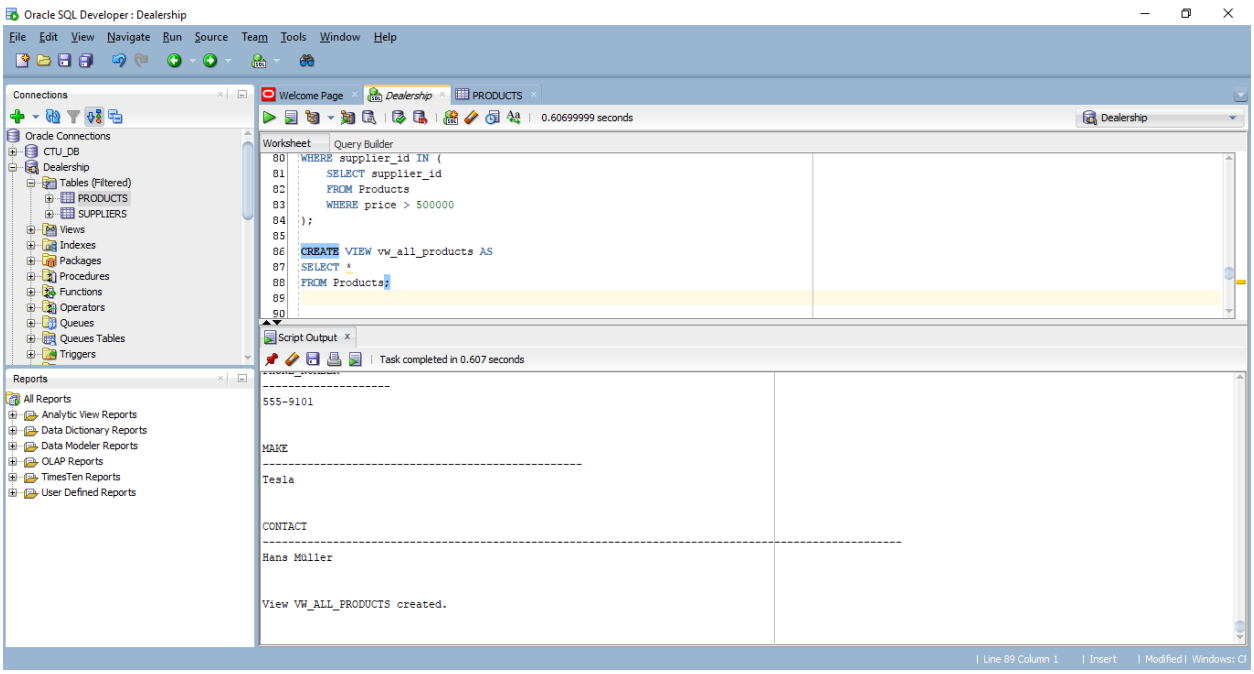
2.4 Display the phone number of the supplier if ALL records on the products table have mileage equal to zero (

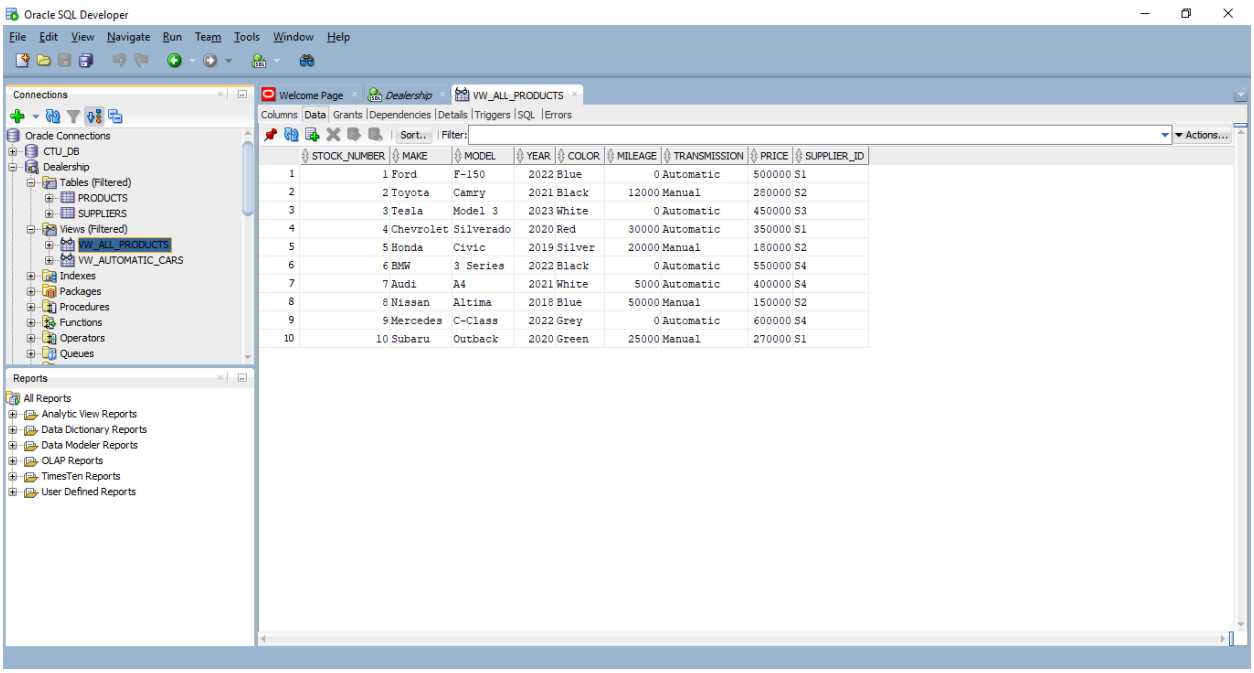
Question 3

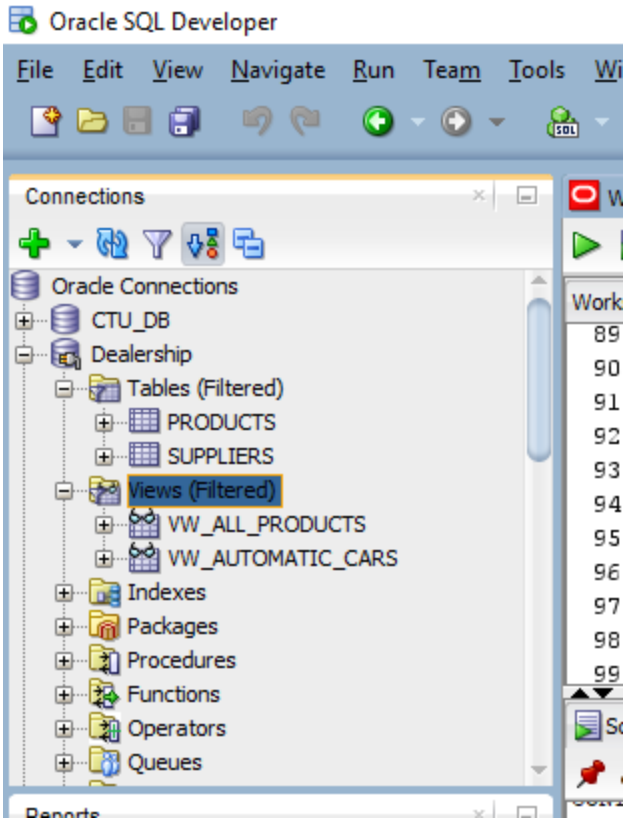
This task includes learning unit 10: Managing Schema Objects. Write SQL statements to perform the following Views:

3.1 Create a simple view that shows all the columns from the Car Dealership Products Table.

View created


Oracle SQL Developer : Dealership
File Edit View Navigate Run Source Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views
Indexes
Packages
Procedures
Functions
Operators
Queues
Queues Tables
Triggers
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
PRODUCTS
0.60699999 seconds
Dealership
Worksheet
Query Builder
WHERE supplier_id IN (
SELECT supplier_id
FROM Products
WHERE price > 500000
);
CREATE VIEW vw_all_products AS
SELECT *
FROM Products;
Script Output
Task completed in 0.607 seconds
555-9101
MAKE
Tesla
CONTACT
Hans Müller
View VW_ALL_PRODUCTS created.
Line 89 Column 1
Insert
Modified
Windows: CI

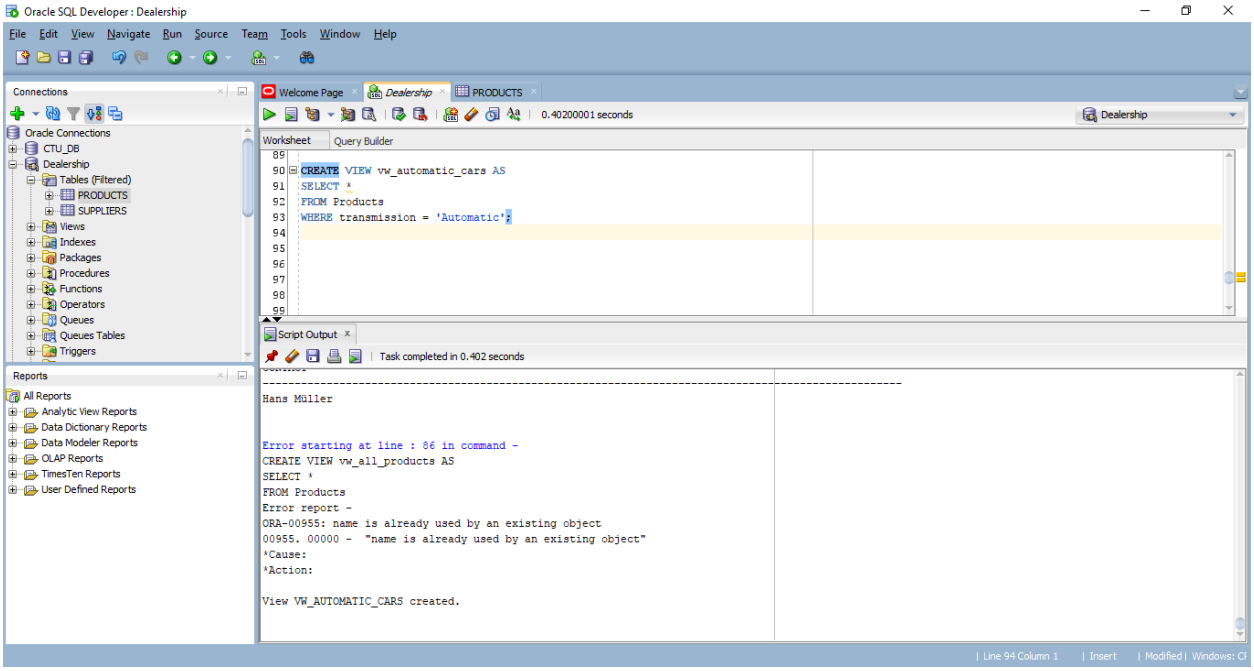

Oracle SQL Developer
File Edit View Navigate Run Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views (Filtered)
VW_ALL_PRODUCTS
VW_AUTOMATIC_CARS
Indexes
Packages
Procedures
Functions
Operators
Queues
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
VW_ALL_PRODUCTS
Columns
Data
Grants
Dependencies
Details
Triggers
SQL
Errors
Sort...
Filter:
Actions...
STOCK_NUMBER MAKE MODEL YEAR COLOR MILEAGE TRANSMISSION PRICE SUPPLIER_ID
1 1 Ford F-150 2022 Blue 0 Automatic 500000 S1
2 2 Toyota Camry 2021 Black 12000 Manual 280000 S2
3 3 Tesla Model 3 2023 White 0 Automatic 450000 S3
4 4 Chevrolet Silverado 2020 Red 30000 Automatic 350000 S1
5 5 Honda Civic 2019 Silver 20000 Manual 180000 S2
6 6 BMW 3 Series 2022 Black 0 Automatic 550000 S4
7 7 Audi A4 2021 White 5000 Automatic 400000 S4
8 8 Nissan Altima 2018 Blue 50000 Manual 150000 S2
9 9 Mercedes C-Class 2022 Grey 0 Automatic 600000 S4
10 10 Subaru Outback 2020 Green 25000 Manual 270000 S1

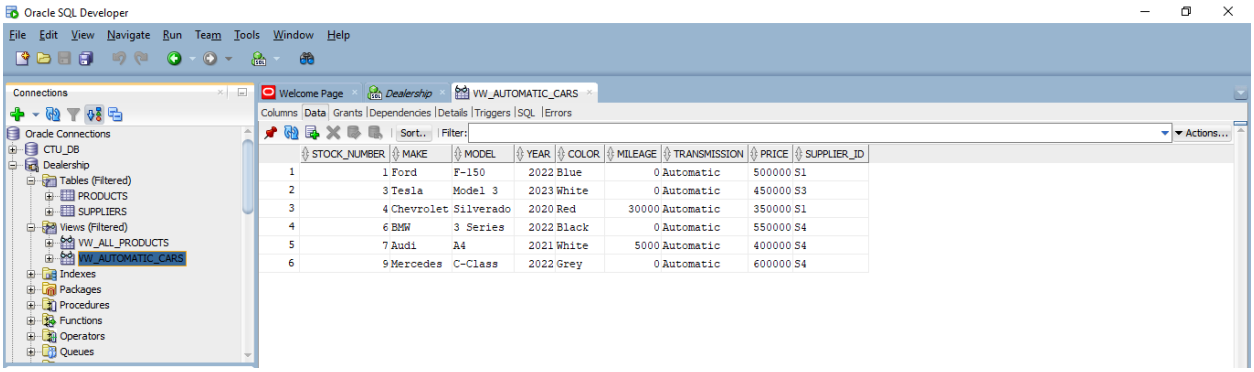


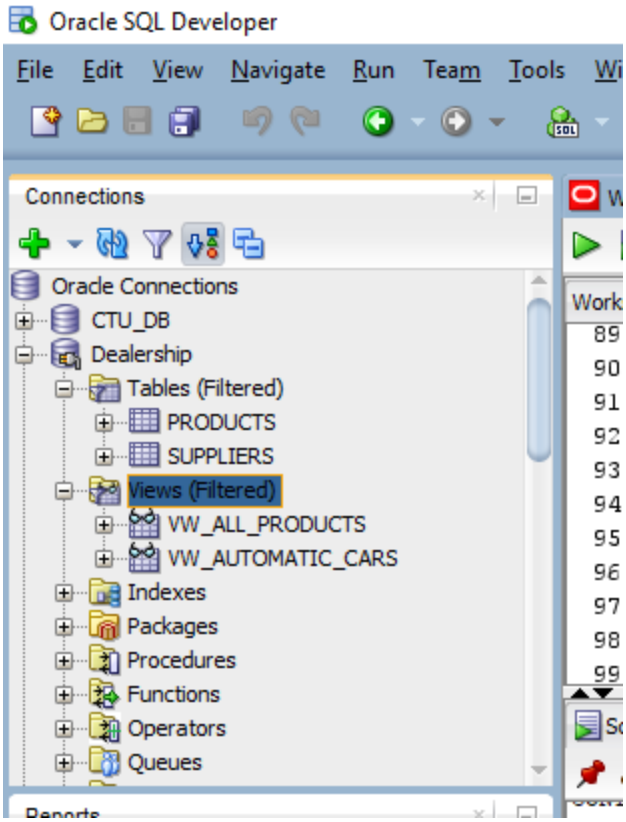
Code

```
CREATE VIEW vw_all_products AS

SELECT *

FROM Products;


CREATE VIEW vw_automatic_cars AS

SELECT *

FROM Products

WHERE transmission = 'Automatic';
```

3.2 Create a view that shows all cars with automatic transmission and their details.


Oracle SQL Developer : Dealership
File Edit View Navigate Run Source Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views
Indexes
Packages
Procedures
Functions
Operators
Queues
Queues Tables
Triggers
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
PRODUCTS
0.40200001 seconds
Dealership
Worksheet
Query Builder
89
90 CREATE VIEW vw_automatic_cars AS
91 SELECT *
92 FROM Products
93 WHERE transmission = 'Automatic';
94
95
96
97
98
99
Script Output
Task completed in 0.402 seconds
Hans Müller
Error starting at line : 86 in command -
CREATE VIEW vw_all_products AS
SELECT *
FROM Products
Error report -
ORA-00955: name is already used by an existing object
00955. 00000 - "name is already used by an existing object"
*Cause:
*Action:
View VW_AUTOMATIC_CARS created.
Line 94 Column 1
Insert
Modified
Windows: CI


Oracle SQL Developer
File Edit View Navigate Run Team Tools Window Help
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views (Filtered)
VW_ALL_PRODUCTS
VW_AUTOMATIC_CARS
Indexes
Packages
Procedures
Functions
Operators
Queues
Welcome Page
Dealership
VW_AUTOMATIC_CARS
Columns
Data
Grants
Dependencies
Details
Triggers
SQL
Errors
Sort...
Filter:
Actions...
STOCK_NUMBER MAKE MODEL YEAR COLOR MILEAGE TRANSMISSION PRICE SUPPLIER_ID
1 1 Ford F-150 2022 Blue 0 Automatic 500000 S1
2 3 Tesla Model 3 2023 White 0 Automatic 450000 S3
3 4 Chevrolet Silverado 2020 Red 30000 Automatic 350000 S1
4 6 BMW 3 Series 2022 Black 0 Automatic 550000 S4
5 7 Audi A4 2021 White 5000 Automatic 400000 S4
6 9 Mercedes C-Class 2022 Grey 0 Automatic 600000 S4

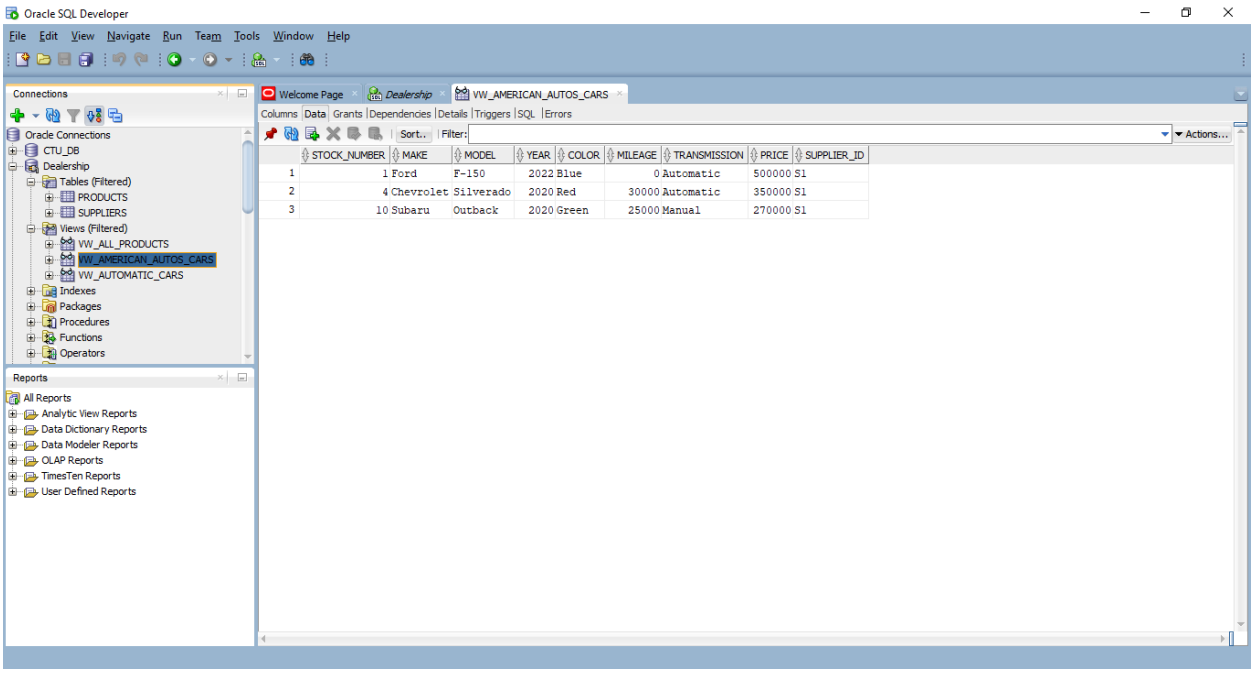


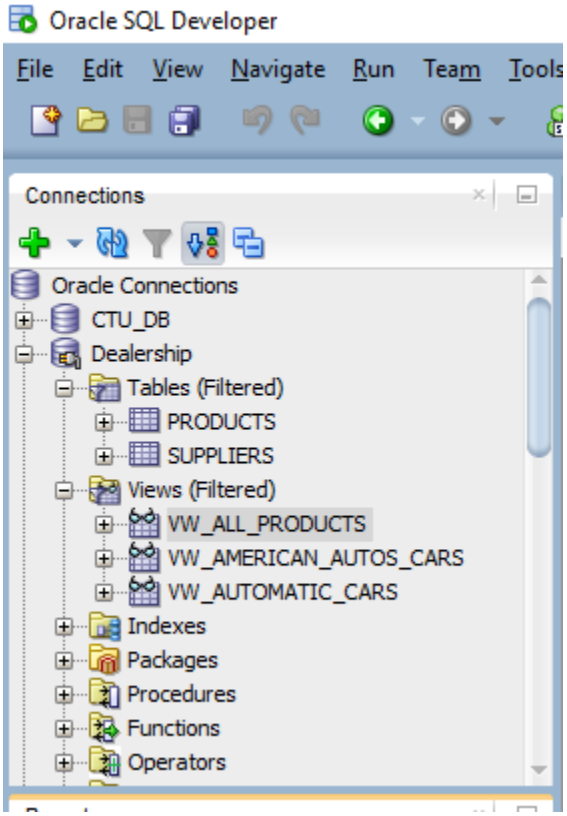
Code

```
CREATE VIEW vw_all_products AS
SELECT *
FROM Products;


CREATE VIEW vw_automatic_cars AS
SELECT *
FROM Products
WHERE transmission = 'Automatic';
```

3.3 Create a view that lists all cars supplied by "American Autos" with their details.

American Autos

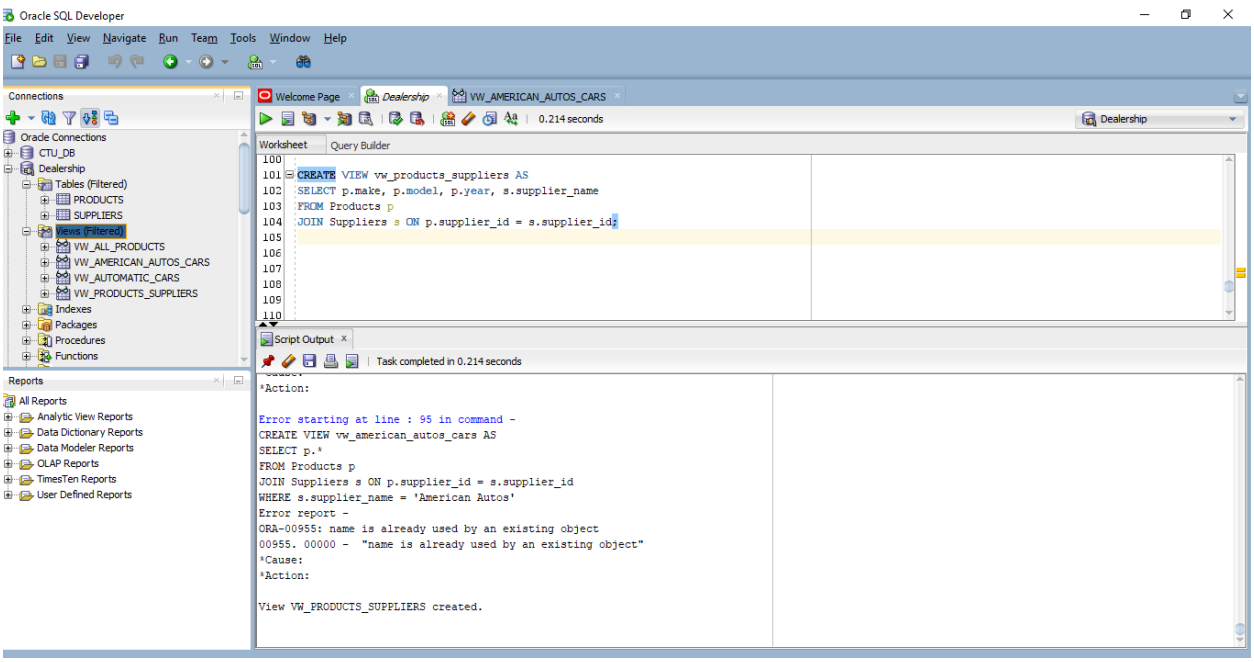


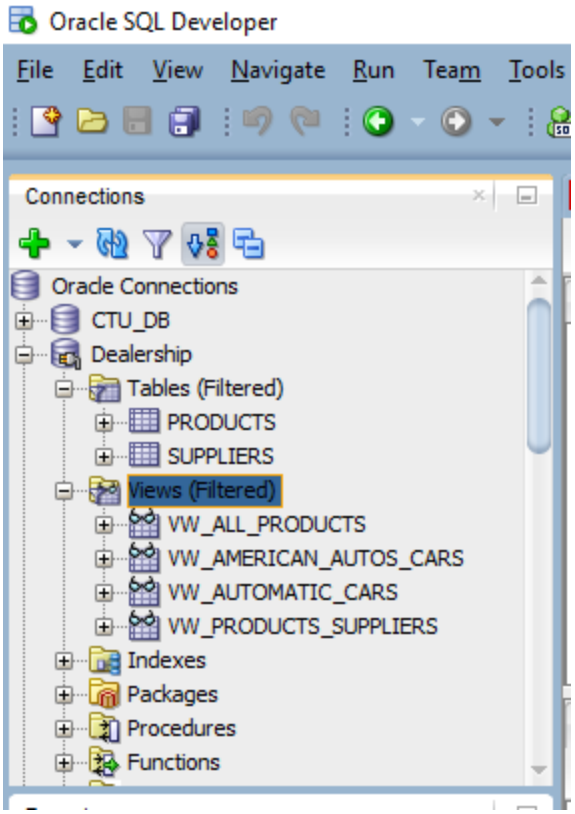


Code

```
CREATE VIEW vw_american_autos_cars AS
SELECT p.*
FROM Products p
JOIN Suppliers s ON p.supplier_id = s.supplier_id
WHERE s.supplier_name = 'American Autos';
```

3.4 Create a complex view that joins the Car Dealership Products Table and the Supplier Table to show the Make, Model, Year, and Supplier Name.




Oracle SQL Developer
File Edit View Navigate Run Team Tools
Connections
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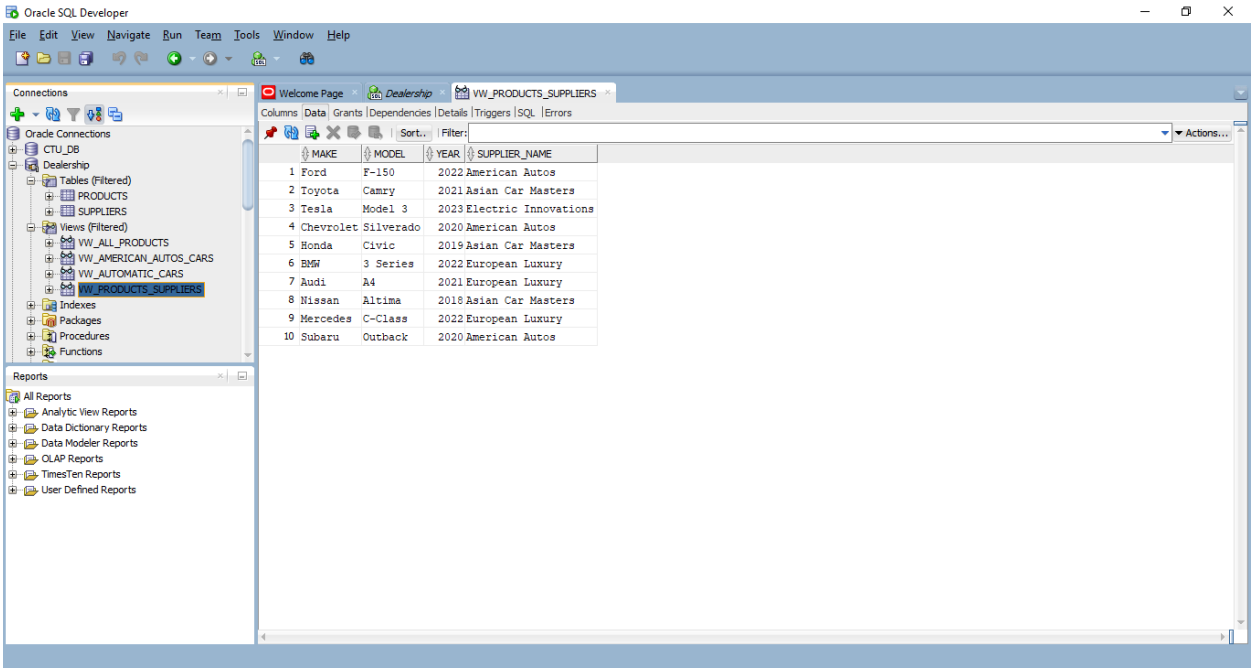
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views (Filtered)
VW_ALL_PRODUCTS
VW_AMERICAN_AUTOS_CARS
VW_AUTOMATIC_CARS
VW_PRODUCTS_SUPPLIERS
Indexes
Packages
Procedures
Functions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Connections
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CTU_DB
Dealership
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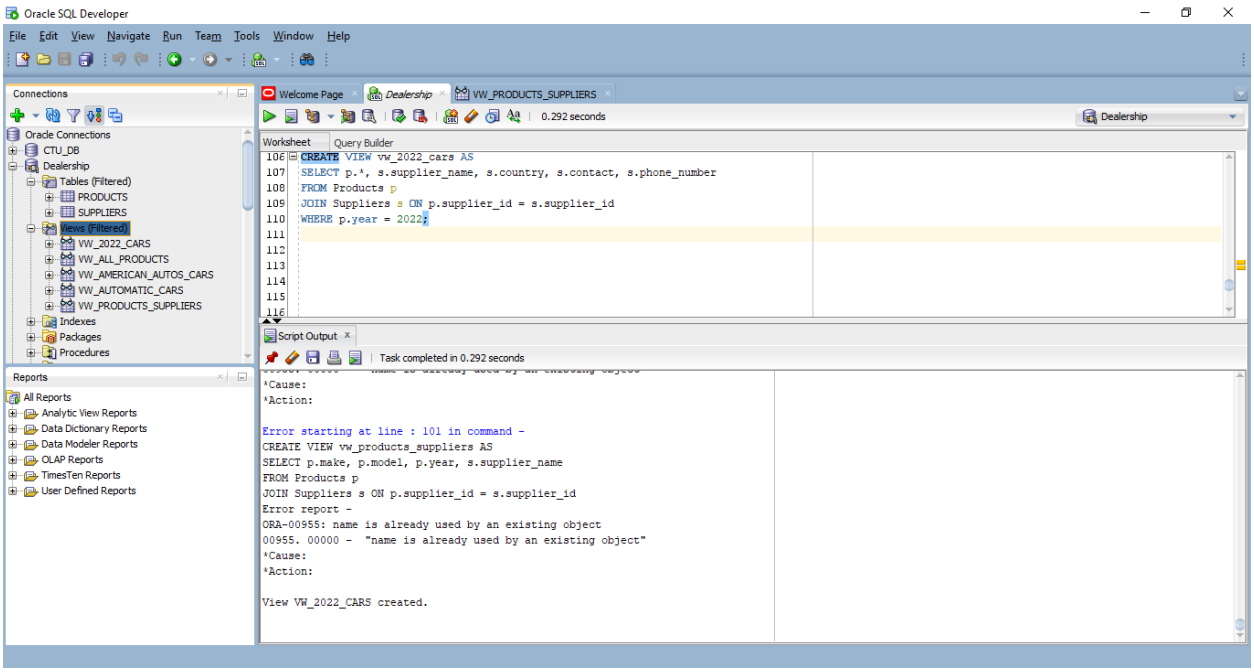
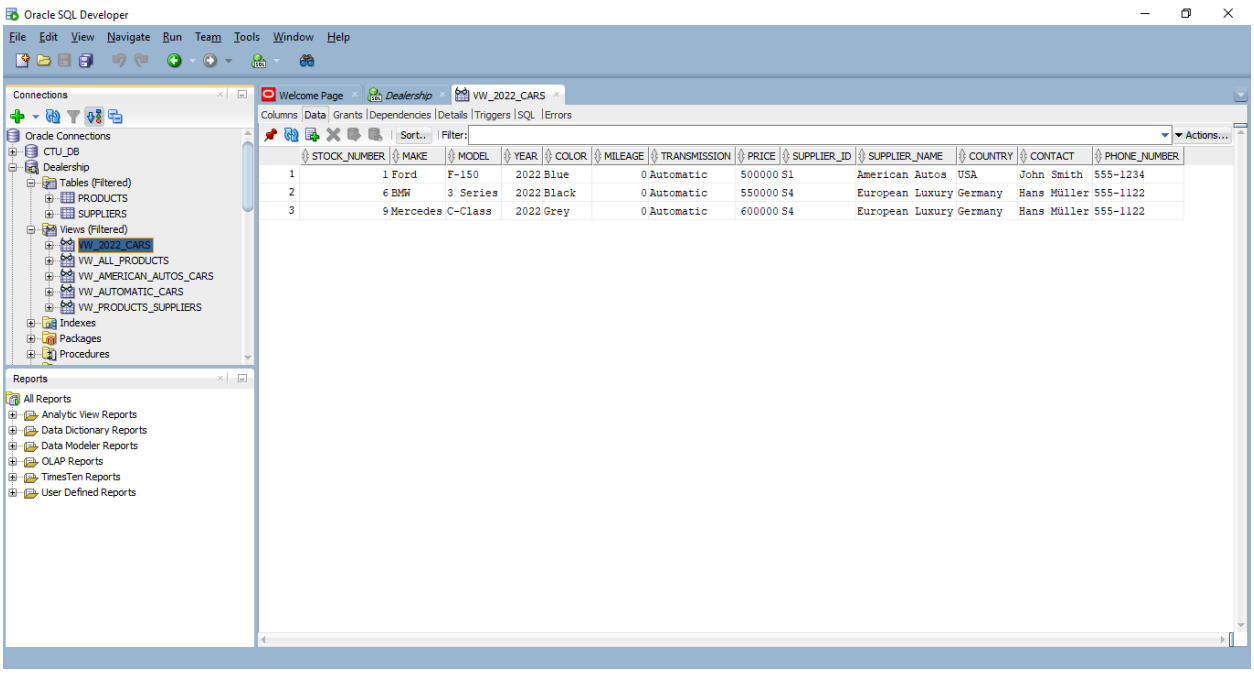
PRODUCTS
SUPPLIERS
Views (Filtered)
VW_ALL_PRODUCTS
VW_AMERICAN_AUTOS_CARS
VW_AUTOMATIC_CARS
VW_PRODUCTS_SUPPLIERS
Indexes
Packages
Procedures
Functions
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
VW_PRODUCTS_SUPPLIERS
Columns Data Grants Dependencies Details Triggers SQL Errors
Sort... Filter: Actions...
MAKE MODEL YEAR SUPPLIER_NAME
1 Ford F-150 2022 American Autos
2 Toyota Camry 2021 Asian Car Masters
3 Tesla Model 3 2023 Electric Innovations
4 Chevrolet Silverado 2020 American Autos
5 Honda Civic 2019 Asian Car Masters
6 BMW 3 Series 2022 European Luxury
7 Audi A4 2021 European Luxury
8 Nissan Altima 2018 Asian Car Masters
9 Mercedes C-Class 2022 European Luxury
10 Subaru Outback 2020 American Autos

Code

```
CREATE VIEW vw_products_suppliers AS
SELECT p.make, p.model, p.year, s.supplier_name
FROM Products p
JOIN Suppliers s ON p.supplier_id = s.supplier_id;
```

3.5 Create a view that lists cars from the year 2022 and their supplier details.




Oracle SQL Developer
File Edit View Navigate Run Team Tools Window Help
Connections
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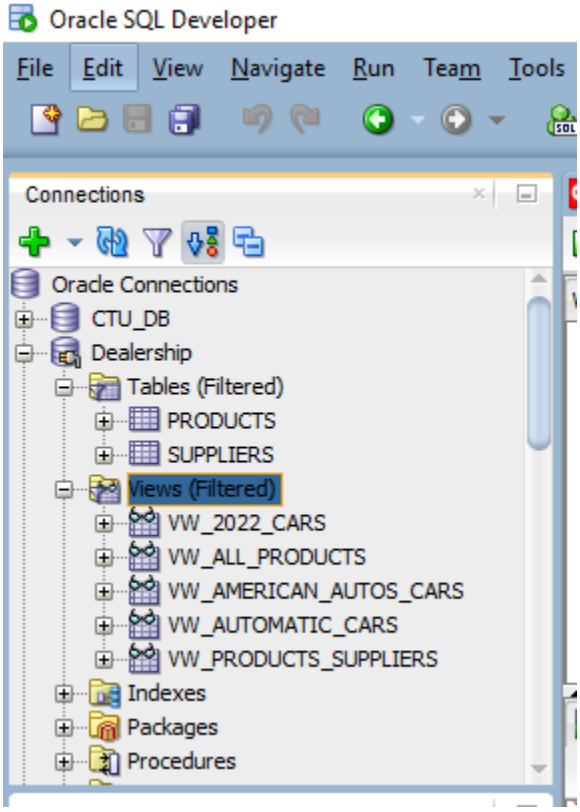
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views (Filtered)
VW_2022_CARS
VW_ALL_PRODUCTS
VW_AMERICAN_AUTOS_CARS
VW_AUTOMATIC_CARS
VW_PRODUCTS_SUPPLIERS
Indexes
Packages
Procedures
Reports
All Reports
Analytic View Reports
Data Dictionary Reports
Data Modeler Reports
OLAP Reports
TimesTen Reports
User Defined Reports
Welcome Page
Dealership
VW_2022_CARS
Columns Data Grants Dependencies Details Triggers SQL Errors
Sort..
Filter:
Actions...
STOCK_NUMBER MAKE MODEL YEAR COLOR MILEAGE TRANSMISSION PRICE SUPPLIER_ID SUPPLIER_NAME COUNTRY CONTACT PHONE_NUMBER
1 1 Ford F-150 2022 Blue 0 Automatic 500000 S1 American Autos USA John Smith 555-1234
2 6 BMW 3 Series 2022 Black 0 Automatic 550000 S4 European Luxury Germany Hans Müller 555-1122
3 9 Mercedes C-Class 2022 Grey 0 Automatic 600000 S4 European Luxury Germany Hans Müller 555-1122


Oracle SQL Developer
File Edit View Navigate Run Team Tools
Connections
Oracle Connections
CTU_DB
Dealership
Tables (Filtered)
PRODUCTS
SUPPLIERS
Views (Filtered)
VW_2022_CARS
VW_ALL_PRODUCTS
VW_AMERICAN_AUTOS_CARS
VW_AUTOMATIC_CARS
VW_PRODUCTS_SUPPLIERS
Indexes
Packages
Procedures

Code

REATE VIEW vw_2022_cars AS

SELECT p.*, s.supplier_name, s.country, s.contact, s.phone_number

FROM Products p

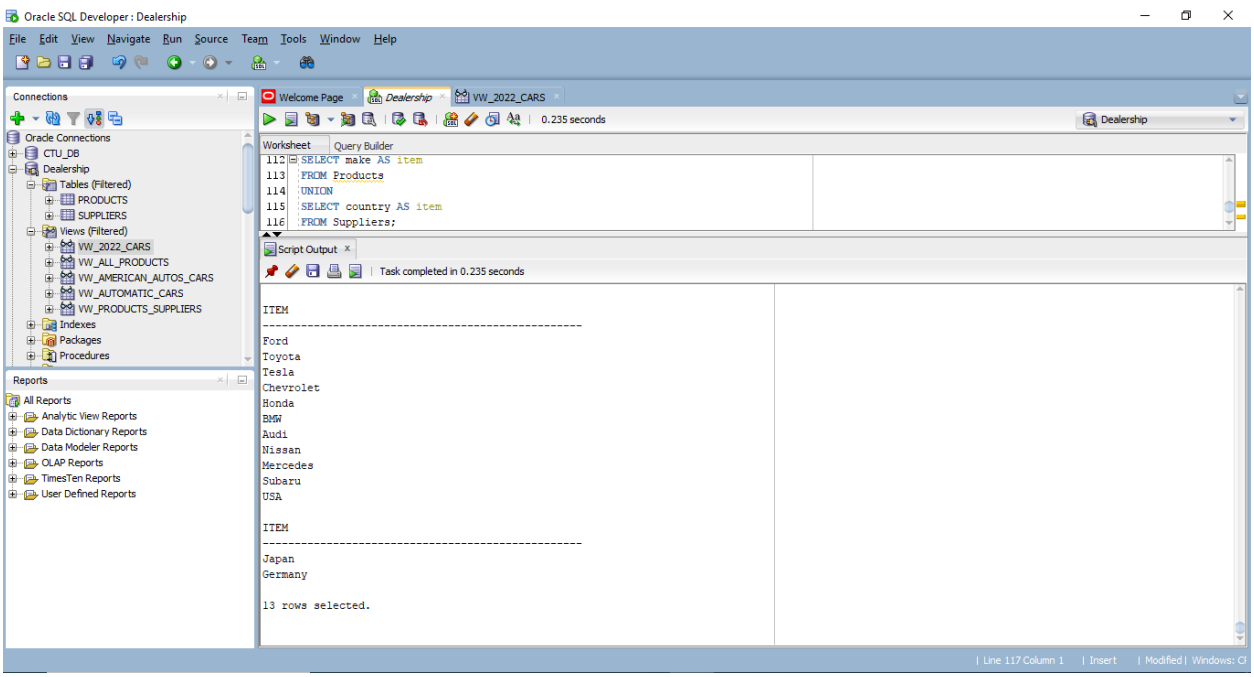
JOIN Suppliers s ON p.supplier_id = s.supplier_id

WHERE p.year = 2022;

Question 4

This task includes learning unit 11: Using the Set Operators. Write SQL statements to use Set Operator to Combine Multiple Queries into a Single Query:

4.1 List all unique car makes available in the Car Dealership Products Table and Supplier countries in a single column.



SELECT make AS item

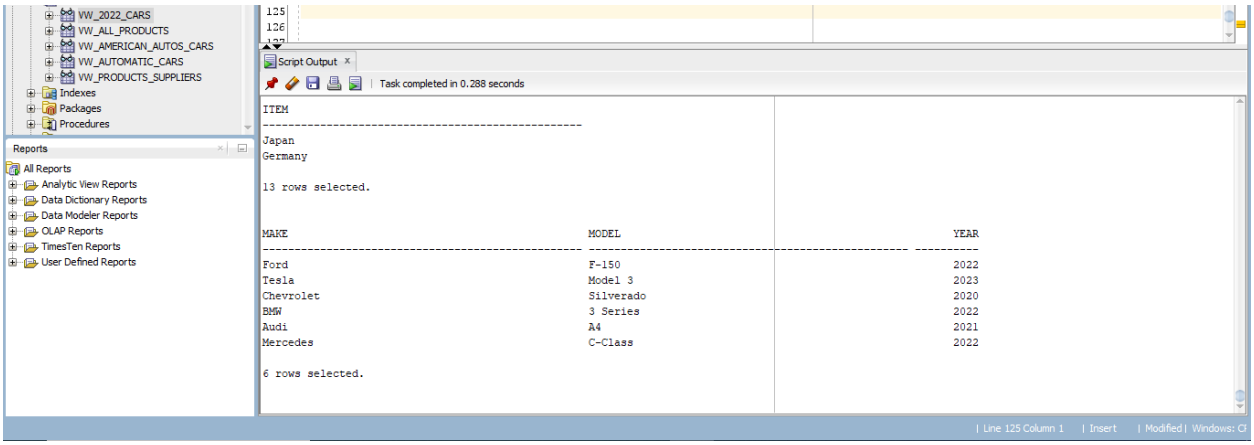
FROM Products

UNION

SELECT country AS item

FROM Suppliers;

4.2 List cars with Automatic transmissions and cars from the year 2022. Eliminate duplicate rows.



Code

SELECT make, model, year

FROM Products

WHERE transmission = 'Automatic'

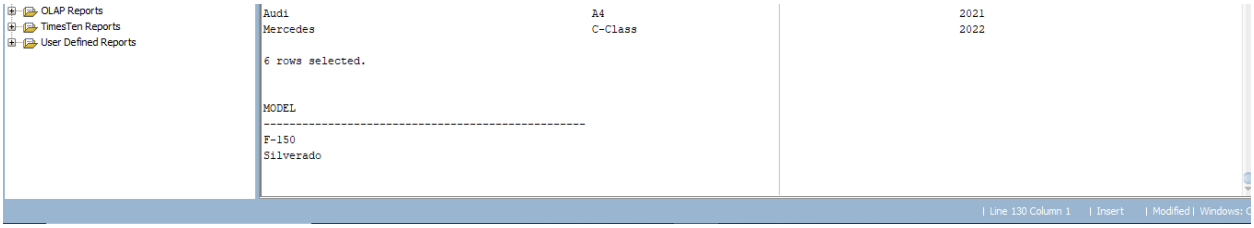
UNION

SELECT make, model, year

FROM Products

WHERE year = 2022;

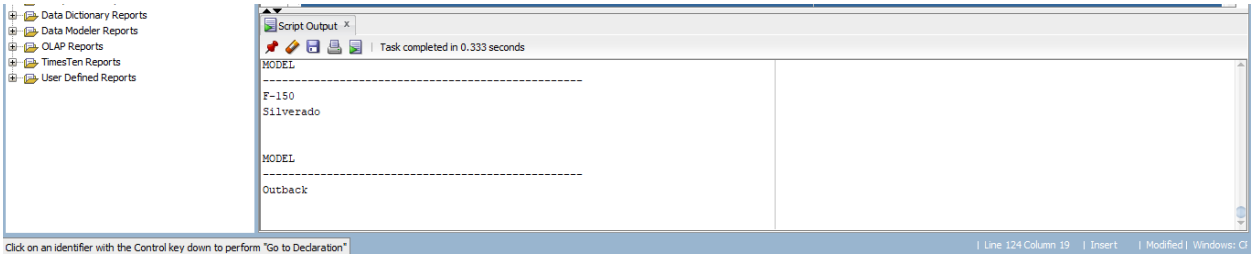
4.3 Find car models that are both supplied by "American Autos" and have Automatic transmissions.



Code

```
SELECT p.model
FROM Products p
JOIN Suppliers s ON p.supplier_id = s.supplier_id
WHERE s.supplier_name = 'American Autos' AND p.transmission = 'Automatic';
```

4.4 List car models that are supplied by "American Autos" but do not have Automatic transmissions.



Code

```
SELECT p.model
FROM Products p
JOIN Suppliers s ON p.supplier_id = s.supplier_id
WHERE s.supplier_name = 'American Autos' AND p.transmission != 'Automatic';
```