# Overview of the Assignment:

Oracle, IBM DB2 and other ORDBMS that support standard object-relational features.

**Please submit screenshots demonstrating the execution of your SQL statements, both DDL , DML and the results of the SQL statements.**

# Object-relational DBMS

In this exercise, we will construct and query an *AUTOMOBILE* table by using abstract data types (ADTs), VARRAYs, and nested tables. The syntax is for Oracle.

1. Create a *PERSON\_TY* abstract data type which has the following fields -- first\_name, last\_name, date\_of\_birth. Assign each field an appropriate data type.
2. Create a *DRIVER\_TY* abstract data type which has the following fields -- *PERSON\_TY,* Drivers\_License\_ID, Date Driven. Assign each field an appropriate data type.
3. Create a *OWNER\_TY* abstract data type which has the following fields -- *PERSON\_TY, Date\_Purchased, Date\_Sold.* Assign each field an appropriate data type.
4. Create a *OWNERS\_VA* VARRAY of the *OWNER\_TY* abstract data type you created in step 2. Define the VARRAY to allow for 3 *OWNER\_TY* elements.
5. Create an *AUTOMOBILE* table which is composed of the following elements:

* A vehicle\_identification\_number field which is the primary key.
* An OWNER*\_VA* VARRAY.
* A nested table named *DRIVERS\_NT* which contains the following fields – *DRIVER\_TY*. Assign each field an appropriate data type.

1. Insert the following rows into the *AUTOMOBILE* table:  
   **ROW 1**

* The Vehicle Identification Number is 101.
* The first driver is named "Erin Smalltalk", who was born on 5/23/1965, driver license MA101, date driven 3/1/2018.
* The second driver is named "Joe Smalltalk", who was born on 10/7/1982, driver license MA204, date driven 3/15/2018.
* The only owner is named "Lance Smalltalk", who purchased the automobile 1/29/2016.

**ROW 2**

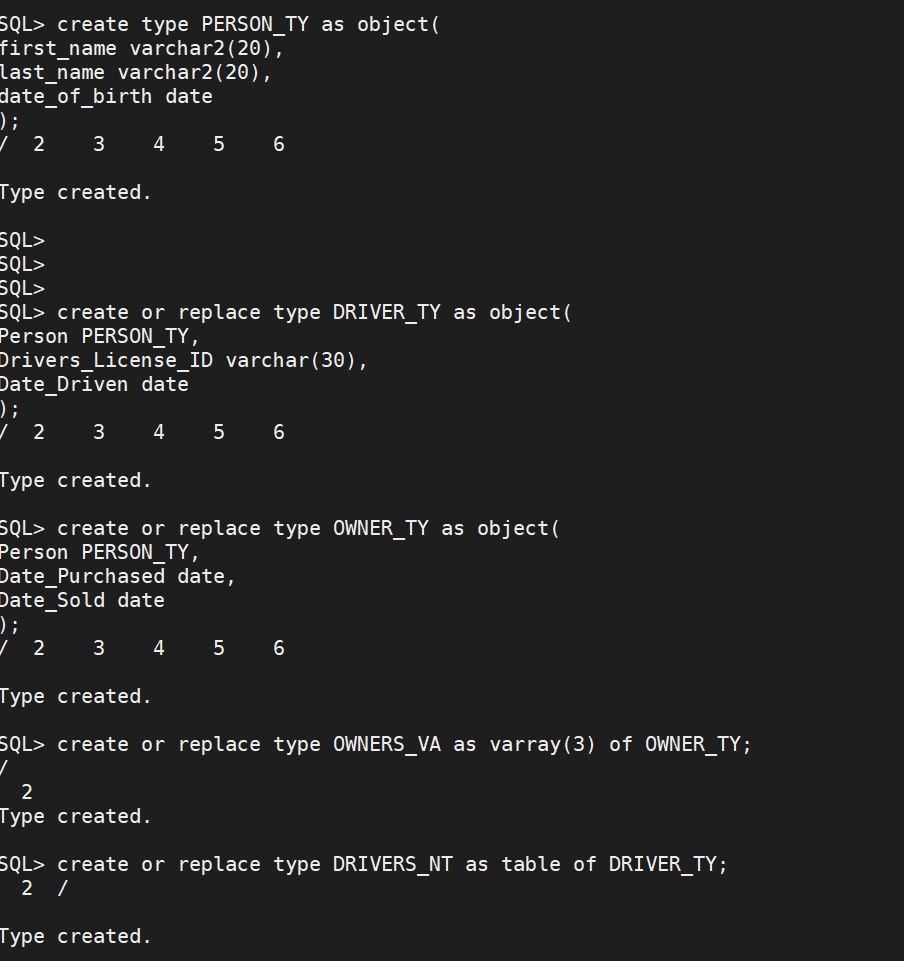
* The Vehicle Identification Number is 102.
* The first driver is named "Julie Goldstein", who was born on 7/19/1977, driver license MA506, date driven 1/5/2016.
* The second driver is named "Max Lucids", who was born on 2/12/1987, driver license MA706, date driven 3/5/2018.
* The first owner is named "George Stephanopolis", who purchased the automobile 7/15/2014 and sold on 6/17/2016.
* The second owner is named "Max Lucids", who purchased the automobile on 6/18/2016.

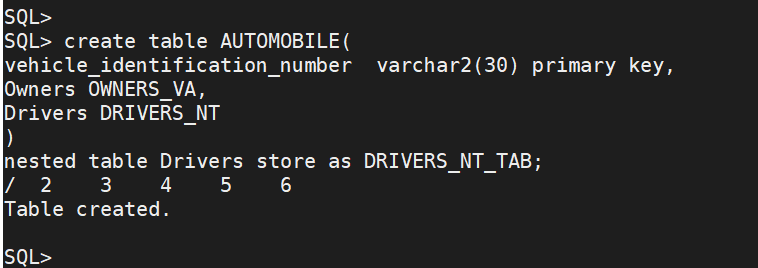
1. Write a query which lists the first and last names of all drivers, along with the vehicle identification number of the car they drive and date driven.
2. Write a query which lists the first and last names of all owners, along with the vehicle identification number of the car, the date of purchase and sale.

create type PERSON\_TY as object(  
first\_name *varchar2*(20),  
last\_name *varchar2*(20),  
date\_of\_birth *date*);  
/

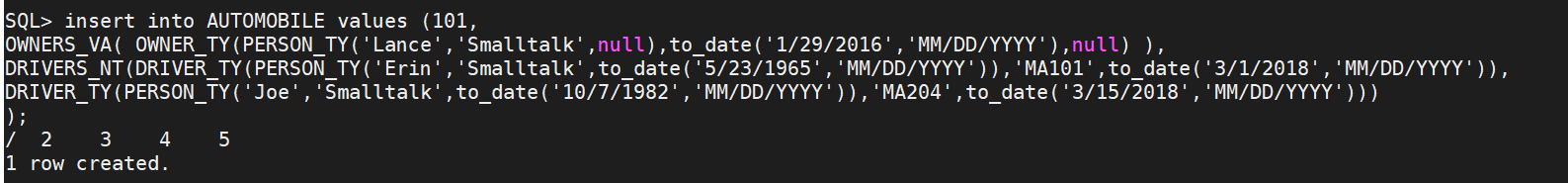
create or replace type DRIVER\_TY as object(  
Person PERSON\_TY,  
Drivers\_License\_ID *varchar*(30),  
Date\_Driven *date*);  
/

create or replace type OWNER\_TY as object(  
Person PERSON\_TY,  
Date\_Purchased *date*,  
Date\_Sold *date*);  
/  
create or replace type OWNERS\_VA as varray(3) of OWNER\_TY;  
/  
  
  
create or replace type DRIVERS\_NT as table of DRIVER\_TY;  
/  
  
create table AUTOMOBILE(  
vehicle\_identification\_number *varchar2*(30) primary key,  
Owners OWNERS\_VA,  
Drivers DRIVERS\_NT  
)  
nested table Drivers store as DRIVERS\_NT\_TAB;  
/

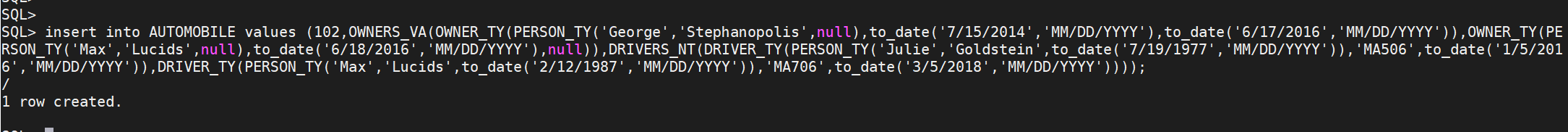




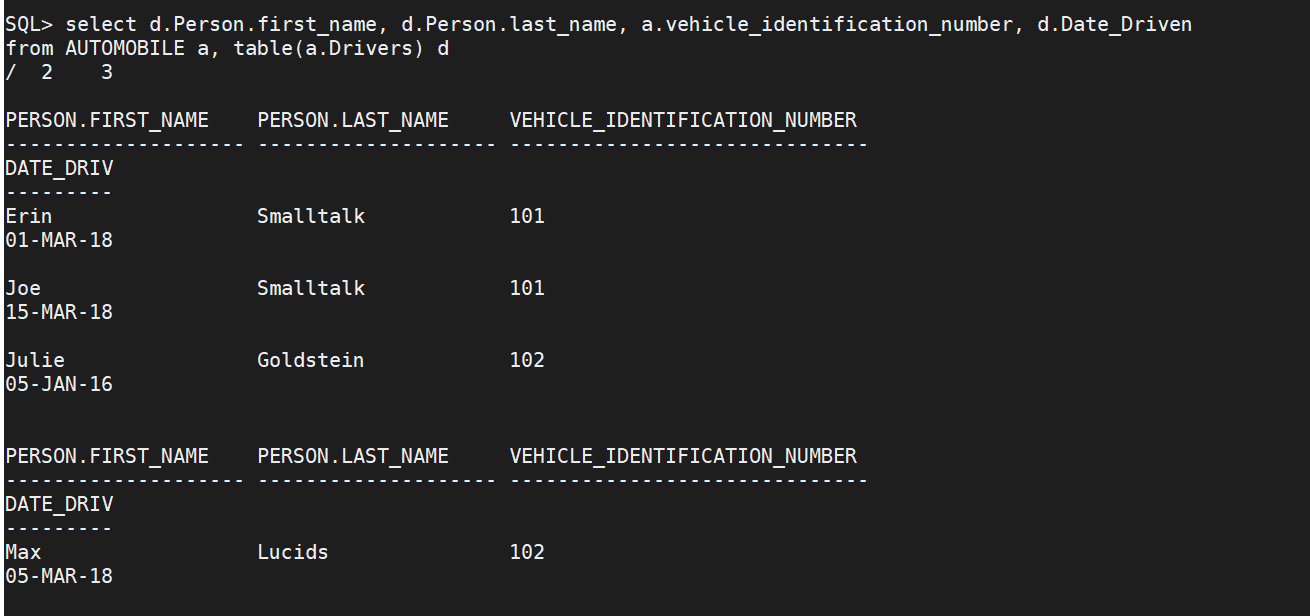
insert into AUTOMOBILE values (101,  
OWNERS\_VA( OWNER\_TY(PERSON\_TY('Lance','Smalltalk',null),to\_date('1/29/2016','MM/DD/YYYY'),null) ),  
DRIVERS\_NT(DRIVER\_TY(PERSON\_TY('Erin','Smalltalk',to\_date('5/23/1965','MM/DD/YYYY')),'MA101',to\_date('3/1/2018','MM/DD/YYYY')),  
DRIVER\_TY(PERSON\_TY('Joe','Smalltalk',to\_date('10/7/1982','MM/DD/YYYY')),'MA204',to\_date('3/15/2018','MM/DD/YYYY')))  
);  
/



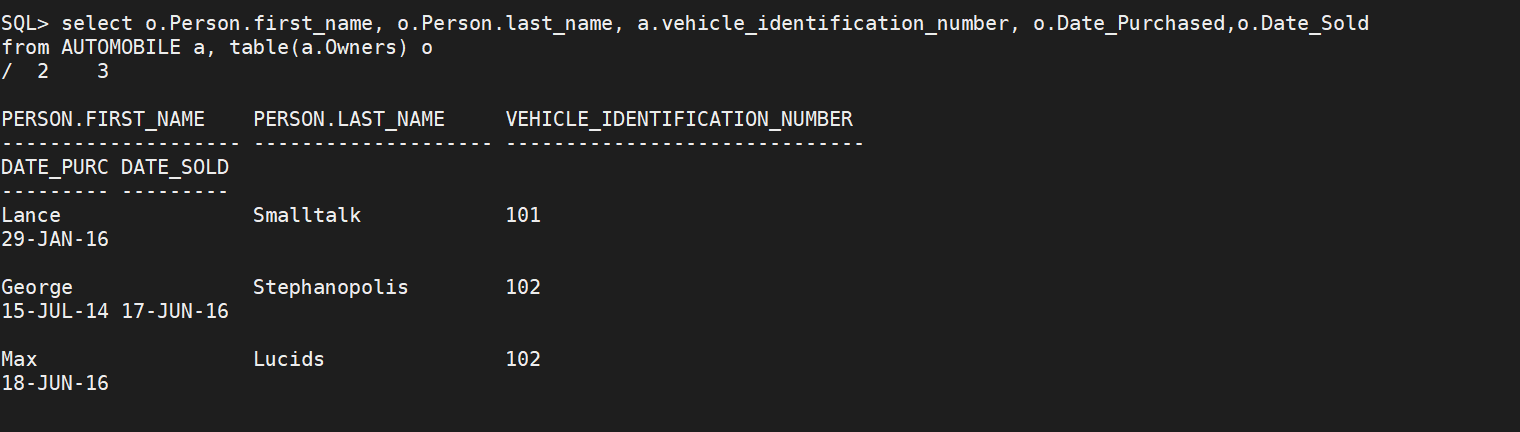
insert into AUTOMOBILE values (102,OWNERS\_VA(OWNER\_TY(PERSON\_TY('George','Stephanopolis',null),to\_date('7/15/2014','MM/DD/YYYY'),to\_date('6/17/2016','MM/DD/YYYY')),OWNER\_TY(PERSON\_TY('Max','Lucids',null),to\_date('6/18/2016','MM/DD/YYYY'),null)),DRIVERS\_NT(DRIVER\_TY(PERSON\_TY('Julie','Goldstein',to\_date('7/19/1977','MM/DD/YYYY')),'MA506',to\_date('1/5/2016','MM/DD/YYYY')),DRIVER\_TY(PERSON\_TY('Max','Lucids',to\_date('2/12/1987','MM/DD/YYYY')),'MA706',to\_date('3/5/2018','MM/DD/YYYY'))));  
/



select d.Person.first\_name, d.Person.last\_name, a.vehicle\_identification\_number, d.Date\_Driven  
from AUTOMOBILE a, table(a.Drivers) d  
/



select o.Person.first\_name, o.Person.last\_name, a.vehicle\_identification\_number, o.Date\_Purchased,o.Date\_Sold  
from AUTOMOBILE a, table(a.Owners) o  
/



Use the **Ask the Teaching Team Discussion Forum** if you have any questions regarding the how to approach this assignment.

Save your assignment as ***lastnameFirstname\_assign6\_0.docx*** and submit it in the *Assignments* section of the course.

For help uploading files please refer to the *Technical Support* page in the syllabus.