**Name: Mi Gao**

**Tools: Oracle Live SQL**

# Overview of the Assignment:

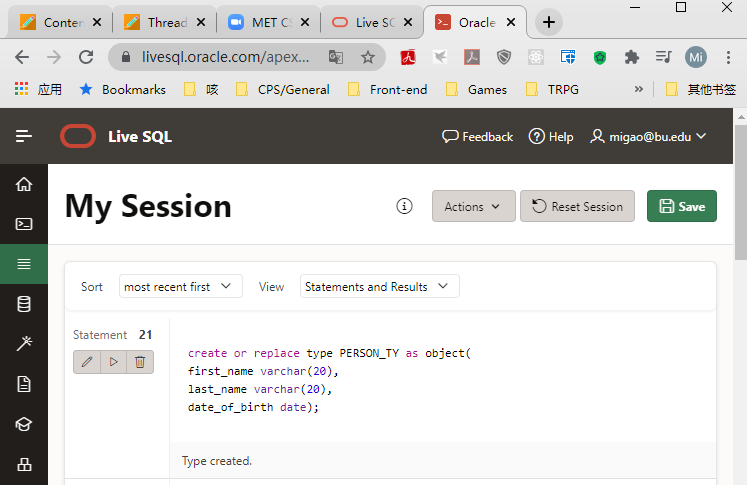
Oracle, IBM DB2 and other ORDBMS that support standard object-relational features.

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

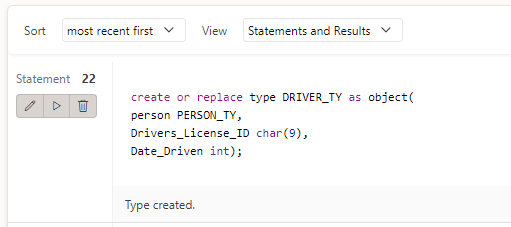
# Object-relational DBMS

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.

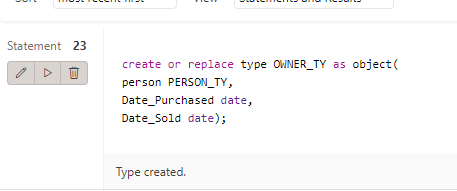
1. Create a *PERSON\_TY* abstract data type which has the following fields -- first\_name, last\_name, date\_of\_birth. Assign each field an appropriate data type.



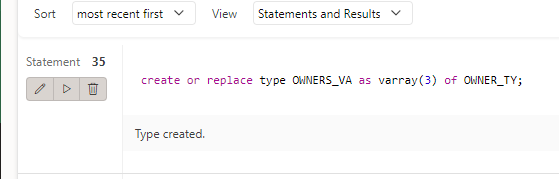
1. Create a *DRIVER\_TY* abstract data type which has the following fields -- *PERSON\_TY,* Drivers\_License\_ID, Date Driven. Assign each field an appropriate data type.



1. 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.

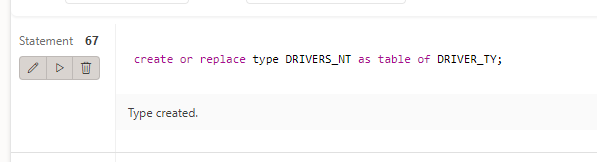
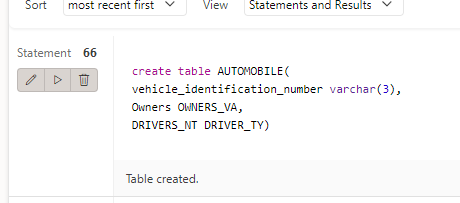


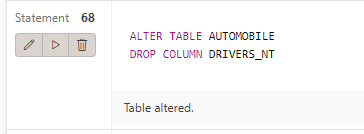
1. Create a *OWNERS\_VA* VARRAY of the *OWNER\_TY* abstract data type you created in step 2. Define the VARRAY to allow for 3 *OWNER\_TY* elements.

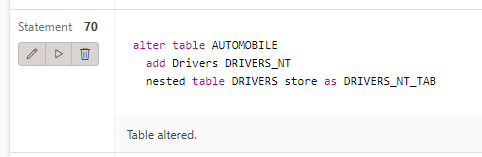


1. Create an *AUTOMOBILE* table which is composed of the following elements:

* 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.





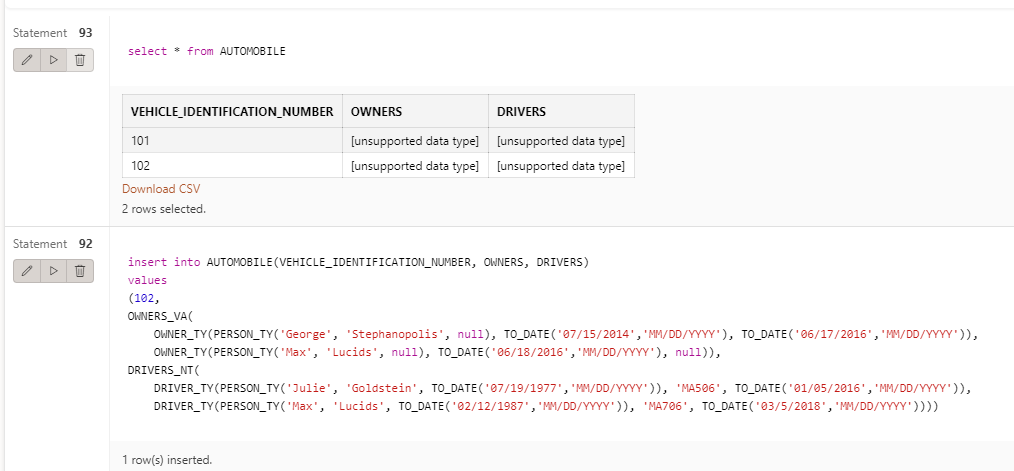
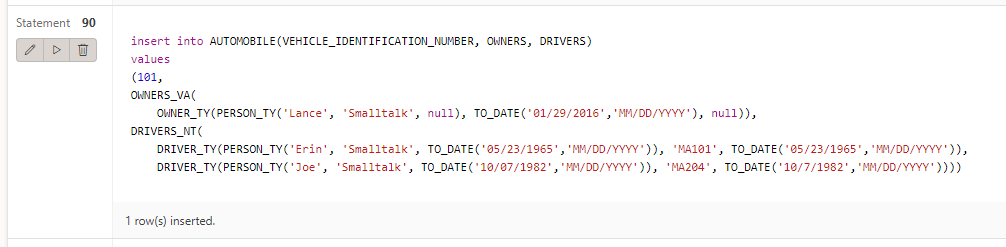


1. Insert the following rows into the *AUTOMOBILE* table:  
   **ROW 1**

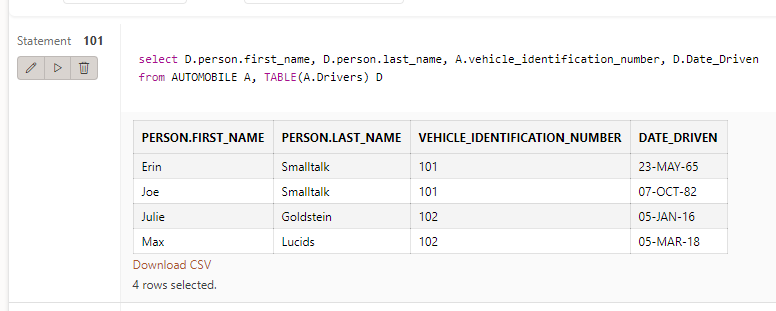
* The Vehicle Identification Number is 101.
* The first driver is named "Erin Smalltalk", who was born on 5/23/1965, driver license MA101, date driven 3/1/2018.
* The second driver is named "Joe Smalltalk", who was born on 10/7/1982, driver license MA204, date driven 3/15/2018.
* The only owner is named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

**ROW 2**

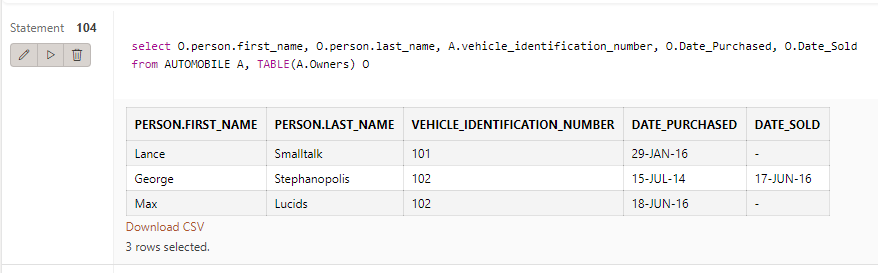
* The Vehicle Identification Number is 102.
* The first driver is named "Julie Goldstein", who was born on 7/19/1977, driver license MA506, date driven 1/5/2016.
* The second driver is named "Max Lucids", who was born on 2/12/1987, driver license MA706, date driven 3/5/2018.
* The first owner is named "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.



1. 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.



--Codes:

drop type PERSON\_TY;

drop type DRIVER\_TY;

drop type OWNER\_TY;

drop table DRIVERS\_NT;

drop table AUTOMOBILE;

create or replace type PERSON\_TY as object(

first\_name varchar(20),

last\_name varchar(20),

date\_of\_birth date);

create or replace type DRIVER\_TY as object(

person PERSON\_TY,

Drivers\_License\_ID char(5),

Date\_Driven date);

-----------VARRAY

-- create a new owner data type

create or replace type OWNER\_TY as object(

person PERSON\_TY,

Date\_Purchased date,

Date\_Sold date);

-- now create a varray of professors

create or replace type OWNERS\_VA as varray(3) of OWNER\_TY;

-- create a AUTOMOBILE table

create table AUTOMOBILE(

vehicle\_identification\_number varchar(3),

Owners OWNERS\_VA,

DRIVERS\_NT DRIVER\_TY);

-- create a nested table called DRIVERS\_NT

create or replace type DRIVERS\_NT as table of DRIVER\_TY;

-- make update

ALTER TABLE AUTOMOBILE

DROP COLUMN DRIVERS\_NT;

alter table AUTOMOBILE

add Drivers DRIVERS\_NT

nested table DRIVERS store as DRIVERS\_NT\_TAB;

insert into AUTOMOBILE(VEHICLE\_IDENTIFICATION\_NUMBER, OWNERS, DRIVERS)

values

(101,

OWNERS\_VA(

OWNER\_TY(PERSON\_TY('Lance', 'Smalltalk', null), TO\_DATE('01/29/2016','MM/DD/YYYY'), null)),

DRIVERS\_NT(

DRIVER\_TY(PERSON\_TY('Erin', 'Smalltalk', TO\_DATE('05/23/1965','MM/DD/YYYY')), 'MA101', TO\_DATE('05/23/1965','MM/DD/YYYY')),

DRIVER\_TY(PERSON\_TY('Joe', 'Smalltalk', TO\_DATE('10/07/1982','MM/DD/YYYY')), 'MA204', TO\_DATE('10/7/1982','MM/DD/YYYY'))));

insert into AUTOMOBILE(VEHICLE\_IDENTIFICATION\_NUMBER, OWNERS, DRIVERS)

values

(102,

OWNERS\_VA(

OWNER\_TY(PERSON\_TY('George', 'Stephanopolis', null), TO\_DATE('07/15/2014','MM/DD/YYYY'), TO\_DATE('06/17/2016','MM/DD/YYYY')),

OWNER\_TY(PERSON\_TY('Max', 'Lucids', null), TO\_DATE('06/18/2016','MM/DD/YYYY'), null)),

DRIVERS\_NT(

DRIVER\_TY(PERSON\_TY('Julie', 'Goldstein', TO\_DATE('07/19/1977','MM/DD/YYYY')), 'MA506', TO\_DATE('01/05/2016','MM/DD/YYYY')),

DRIVER\_TY(PERSON\_TY('Max', 'Lucids', TO\_DATE('02/12/1987','MM/DD/YYYY')), 'MA706', TO\_DATE('03/5/2018','MM/DD/YYYY'))));

-- TEST

select A.vehicle\_identification\_number, D.l

from AUTOMOBILE A, Table(A.Drivers) D;

-- 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.

select D.person.first\_name, D.person.last\_name, A.vehicle\_identification\_number, D.Date\_Driven

from AUTOMOBILE A, TABLE(A.Drivers) D;

-- 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.

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.