**SQL\*Plus: Release 21.0.0.0.0 - Production on Thu May 16 19:37:56 2024**

**Version 21.3.0.0.0**

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**Enter user-name: system**

**Enter password:**

**Last Successful login time: Thu May 16 2024 19:30:18 +05:30**

**Connected to:**

**Oracle Database 21c Express Edition Release 21.0.0.0.0 - Production**

**Version 21.3.0.0.0**

**SQL>create type address\_ty as object**

**(street varchar2(60),**

**city varchar2(30),**

**state char(2),**

**zip varchar(9));**

**/**

**Type created.**

**SQL> CREATE TYPE pers\_ty AS OBJECT**

**(name varchar2(25),**

**address address\_ty);**

**/**

**Type created.**

**SQL> CREATE TYPE employee\_ty AS OBJECT**

**(emp\_id varchar2(9),**

**person pers\_ty);**

**/**

**Type created.**

**SQL> create table employee**

**(full\_emp employee\_ty);**

**Table created.**

**SQL> insert into employee values**

**(employee\_ty('100',**

**pers\_ty('Ram',**

**address\_ty('1000 TU',**

**'Patiala', 'PB', '147001'))));**

**1 row created.**

**SQL> insert into employee values**

**(employee\_ty('101',**

**pers\_ty('Sham',**

**address\_ty('1001 TU',**

**'Patiala', 'PB', '147001'))));**

**1 row created.**

**SQL> select \* from employee;**

**FULL\_EMP(EMP\_ID, PERSON(NAME, ADDRESS(STREET, CITY, STATE, ZIP)))**

**--------------------------------------------------------------------------------**

**EMPLOYEE\_TY('100', PERS\_TY('Ram', ADDRESS\_TY('1000 TU', 'Patiala', 'PB', '147001')))**

**EMPLOYEE\_TY('101', PERS\_TY('Sham', ADDRESS\_TY('1001 TU', 'Patiala', 'PB', '147001')))**

**SQL> desc employee;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**FULL\_EMP EMPLOYEE\_TY**

**SQL> select e.full\_emp.emp\_id ID,**

**e.full\_emp.person.name NAME,**

**e.full\_emp.person.address.city CITY**

**from employee e;**

**ID NAME CITY**

**--------- ------------------------- ------------------------------**

**100 Ram Patiala**

**101 Sham Patiala**

**SQL> Update employee e set**

**e.full\_emp.person.name='Raj'**

**where**

**e.full\_emp.emp\_id='100';**

**1 row updated.**

**SQL> select e.full\_emp.emp\_id ID,**

**e.full\_emp.person.name NAME,**

**e.full\_emp.person.address.city CITY**

**from employee e;**

**ID NAME CITY**

**--------- ------------------------- ------------------------------**

**100 Raj Patiala**

**101 Sham Patiala**

**SQL> create or replace type newemployee\_ty as object (firstname varchar2(25),**

**lastname varchar2(25), birthdate date,**

**member function AGE(birthdate in DATE) return NUMBER)**

**/**

**Type created.**

**SQL> create or replace type body newemployee\_ty as**

**member function AGE(BirthDate in DATE) return NUMBER is**

**begin**

**RETURN ROUND(SysDate - birthdate);**

**end;**

**end;**

**/**

**Type body created.**

**SQL> create table new\_employee**

**(employee newemployee\_ty);**

**Table created.**

**SQL> insert into new\_employee values**

**(newemployee\_ty('Ram', 'Lal', '12-dec-1976'));**

**1 row created.**

**SQL> select e.employee.firstname, e.employee.age(e.employee.birthdate) from**

**new\_employee e;**

**EMPLOYEE.FIRSTNAME E.EMPLOYEE.AGE(E.EMPLOYEE.BIRTHDATE)**

**------------------------- ------------------------------------**

**Ram 17323**

**SQL> create table new\_employee1 of employee\_ty;**

**Table created.**

**SQL> create type employee\_ty1 as object**

**(emp\_id varchar2(9),**

**person pers\_ty);**

**/**

**Type created.**

**SQL> create table employee1(full\_emp employee\_ty1);**

**Table created.**

**SQL> insert into employee1 values**

**(employee\_ty1('101',**

**pers\_ty('Sham',**

**address\_ty('1001 TU',**

**'Patiala', 'PB', '147001'))));**

**1 row created.**

**SQL> insert into new\_employee1 values**

**('100', pers\_ty('raj',**

**address\_ty('1000 TU', 'Pta', 'Pb', '147001')));**

**1 row created.**

**SQL> select \* from new\_employee1;**

**EMP\_ID**

**---------**

**PERSON(NAME, ADDRESS(STREET, CITY, STATE, ZIP))**

**--------------------------------------------------------------------------------**

**100**

**PERS\_TY('raj', ADDRESS\_TY('1000 TU', 'Pta', 'Pb', '147001'))**

**SQL> select ref(p) from new\_employee1 p;**

**REF(P)**

**--------------------------------------------------------------------------------**

**00002802092BD9C216D8CB40B781AD37662D7552D76A52EE581D1D4A45BF15C100DE82C3FF0041DC**

**F10000**

**SQL> create type new\_department\_oo as object**

**(depno number(3), dname varchar(20));**

**/**

**Type created.**

**SQL> CREATE TABLE department\_table OF new\_department\_oo;**

**Table created.**

**SQL> insert into department\_table values(10, 'comp');**

**1 row created.**

**SQL> insert into department\_table values(20, 'chem');**

**1 row created.**

**SQL> insert into department\_table values(10, 'math');**

**1 row created.**

**SQL> select ref(p) from department\_table p;**

**REF(P)**

**--------------------------------------------------------------------------------**

**00002802092935E206ACCF403EB80F81AC5AE5F1E9FE561B7B0375491F90EABEA52BA75CD3004205**

**090000**

**00002802092A7BBD5E6FD4405FB3BE35F228B113F8FE561B7B0375491F90EABEA52BA75CD3004205**

**090001**

**00002802091ACD5EEE35154C31ACDCEAE3EE8E8E36FE561B7B0375491F90EABEA52BA75CD3004205**

**090002**

**SQL> create table employee\_test\_fk(**

**empno number(3),**

**name varchar(10),**

**dept ref new\_department\_oo);**

**Table created.**

**SQL> desc employee\_test\_fk;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**EMPNO NUMBER(3)**

**NAME VARCHAR2(10)**

**DEPT REF OF NEW\_DEPARTMENT\_OO**

**SQL> set desc depth 2**

**SQL> desc employee\_test\_fk;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**EMPNO NUMBER(3)**

**NAME VARCHAR2(10)**

**DEPT REF OF NEW\_DEPARTMENT\_OO**

**DEPNO NUMBER(3)**

**DNAME VARCHAR2(20)**

**SQL> insert into employee\_test\_fk**

**select 100, 'raj', ref(p) from department\_table p where depno = 10;**

**2 rows created.**

**SQL> insert into employee\_test\_fk**

**select 101, 'shyam', ref(p) from department\_table p where depno = 20;**

**1 row created.**

**SQL> select \* from employee\_test\_fk;**

**EMPNO NAME**

**---------- ----------**

**DEPT**

**--------------------------------------------------------------------------------**

**100 raj**

**00002202082935E206ACCF403EB80F81AC5AE5F1E9FE561B7B0375491F90EABEA52BA75CD3**

**100 raj**

**00002202081ACD5EEE35154C31ACDCEAE3EE8E8E36FE561B7B0375491F90EABEA52BA75CD3**

**101 shyam**

**00002202082A7BBD5E6FD4405FB3BE35F228B113F8FE561B7B0375491F90EABEA52BA75CD3**

**SQL> select empno, name, deref(e.dept) from employee\_test\_fk e;**

**EMPNO NAME**

**---------- ----------**

**DEREF(E.DEPT)(DEPNO, DNAME)**

**--------------------------------------------------------------------------------**

**100 raj**

**NEW\_DEPARTMENT\_OO(10, 'comp')**

**100 raj**

**NEW\_DEPARTMENT\_OO(10, 'math')**

**101 shyam**

**NEW\_DEPARTMENT\_OO(20, 'chem')**

**SQL> select empno, name, deref(e.dept), deref(e.dept).depno depno,**

**deref(e.dept).dname dname from employee\_test\_fk e;**

**EMPNO NAME**

**---------- ----------**

**DEREF(E.DEPT)(DEPNO, DNAME)**

**--------------------------------------------------------------------------------**

**DEPNO DNAME**

**---------- --------------------**

**100 raj**

**NEW\_DEPARTMENT\_OO(10, 'comp')**

**10 comp**

**100 raj**

**NEW\_DEPARTMENT\_OO(10, 'math')**

**10 math**

**EMPNO NAME**

**---------- ----------**

**DEREF(E.DEPT)(DEPNO, DNAME)**

**--------------------------------------------------------------------------------**

**DEPNO DNAME**

**---------- --------------------**

**101 shyam**

**NEW\_DEPARTMENT\_OO(20, 'chem')**

**20 chem**

**SQL> create table employee\_table\_fk**

**(employee employee\_ty,**

**dept ref new\_department\_oo);**

**Table created.**

**SQL> set desc depth 1**

**SQL> desc employee\_table\_fk;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**EMPLOYEE EMPLOYEE\_TY**

**DEPT REF OF NEW\_DEPARTMENT\_OO**

**SQL> set desc depth 2**

**SQL> desc employee\_table\_fk;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**EMPLOYEE EMPLOYEE\_TY**

**EMP\_ID VARCHAR2(9)**

**PERSON PERS\_TY**

**DEPT REF OF NEW\_DEPARTMENT\_OO**

**DEPNO NUMBER(3)**

**DNAME VARCHAR2(20)**

**SQL> set desc depth 3**

**SQL> desc employee\_table\_fk;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**EMPLOYEE EMPLOYEE\_TY**

**EMP\_ID VARCHAR2(9)**

**PERSON PERS\_TY**

**NAME VARCHAR2(25)**

**ADDRESS ADDRESS\_TY**

**DEPT REF OF NEW\_DEPARTMENT\_OO**

**DEPNO NUMBER(3)**

**DNAME VARCHAR2(20)**

**SQL> set desc depth 4**

**SQL> desc employee\_table\_fk;**

**Name Null? Type**

**----------------------------------------- -------- ----------------------------**

**EMPLOYEE EMPLOYEE\_TY**

**EMP\_ID VARCHAR2(9)**

**PERSON PERS\_TY**

**NAME VARCHAR2(25)**

**ADDRESS ADDRESS\_TY**

**STREET VARCHAR2(60)**

**CITY VARCHAR2(30)**

**STATE CHAR(2)**

**ZIP VARCHAR2(9)**

**DEPT REF OF NEW\_DEPARTMENT\_OO**

**DEPNO NUMBER(3)**

**DNAME VARCHAR2(20)**

**INSERT INTO employee\_table\_fk**

**VALUES (**

**employee\_ty(**

**100,**

**pers\_ty('ram', address\_ty('10 tu', 'pat', 'pb', '147001'))**

**),**

**(SELECT REF(P)**

**FROM department\_table P**

**WHERE depno = 10**

**AND ROWNUM = 1)**

**);**

**1 row created.**

**SQL> select \* from employee\_table\_fk;**

**EMPLOYEE(EMP\_ID, PERSON(NAME, ADDRESS(STREET, CITY, STATE, ZIP)))**

**--------------------------------------------------------------------------------**

**DEPT**

**--------------------------------------------------------------------------------**

**EMPLOYEE\_TY('100', PERS\_TY('ram', ADDRESS\_TY('10 tu', 'pat', 'pb', '147001')))**

**00002202082935E206ACCF403EB80F81AC5AE5F1E9FE561B7B0375491F90EABEA52BA75CD3**

**SQL> select e.employee.emp\_id id, e.employee.person.name name,**

**deref(e.dept), deref(e.dept).depno depno,**

**deref(e.dept).dname dname from employee\_table\_fk e;**

**ID NAME**

**--------- -------------------------**

**DEREF(E.DEPT)(DEPNO, DNAME)**

**--------------------------------------------------------------------------------**

**DEPNO DNAME**

**---------- --------------------**

**100 ram**

**NEW\_DEPARTMENT\_OO(10, 'comp')**

**10 comp**