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DBMS LAB ASSIGNMENT

Q1> Implement the following object diagram and test the implementation in a PL/SQL block.

Solution:

```
SQL> create or replace type employee_ty as object
  2  (
  3  id varchar2(5),
  4  name varchar2(20),
  5  address varchar2(20),
  6  hire_date date,
  7  member function getExperience return number,
  8  member function getId return varchar2,
  9  member procedure displayEmpDetail,
 10  member procedure insert_employee(id varchar2,name varchar2,address varchar2,
 11  hire_date date),
 12  member procedure delete_employee(idd varchar2)
 13  )
 14  /

Type created.
```

```
SQL> create table employee1 of employee_ty;

Table created.
```

```
SQL> create or replace type body employee_ty is
  2  member function getExperience return number is
  3  exp number(3);
  4  begin
  5  select trunc((sysdate-hire_date)/365) into exp from dual;
  6  return exp;
  7  end;
  8  member function getId return varchar2 is
  9  id1 varchar2(5);
 10  begin
 11  select id into id1 from dual;
 12  return id1;
 13  end;
 14  member procedure displayEmpDetail is
 15  begin
 16  dbms_output.put_line(id||' '||name||' '||address||' '||hire_date||' '||
 17  getExperience()||' '||getId());
 18  end displayEmpDetail;
 19  member procedure insert_employee(id varchar2,name varchar2,address
 20  varchar2,hire_date date) is
 21  begin
 22  insert into employee1 values(id,name,address,hire_date);
 23  end insert_employee;
 24  member procedure delete_employee(idd varchar2) is
 25  begin
 26  delete from employee1 where id=idd;
 27  end delete_employee;
 28  end;
 29  /

Type body created.
```

```
SQL> declare
  2  a_employee employee_ty;
  3  begin
  4  select value(e) into a_employee from employee1 e where e.id='e01';
  5  a_employee.displayEmpDetail;
  6  end;
  7  /
```

Q2> Implement the following object-oriented diagram relating to assets in a computer laboratory. Execute insert statements for entering data into the tables so created.

```
SQL> create or replace type lab_ty as object
  2  (
  3  lab_id varchar2(4),
  4  location varchar2(20)
  5  )NOT FINAL
  6  /

Type created.

SQL> create type computer_ty under lab_ty
  2  (
  3  comp_id varchar2(4),
  4  description varchar2(20)
  5  )NOT FINAL
  6  /

Type created.

SQL> create type printer_ty under lab_ty
  2  (
  3  printer_id varchar2(4),
  4  description varchar2(20)
  5  )NOT FINAL
  6  /

Type created.

SQL> create type scanner_ty under lab_ty
  2  (
  3  scan_id varchar2(4),
  4  description varchar2(20)
  5  )NOT FINAL
  6  /

Type created.
```

```
SQL> create table lab of lab_ty;

Table created.

SQL> create table computer of computer_ty;

Table created.

SQL> create table printer of printer_ty;

Table created.

SQL> create table scanner of scanner_ty;

Table created.
```

```
SQL> insert into lab values(lab_ty('103','SJT103'));

1 row created.

SQL> insert  into lab
  2  values(computer_ty('103','SJT103','c01','HP'));

1 row created.

SQL> insert into lab  values(printer_ty('103','SJT103','p01','Laserprinter'));

1 row created.

SQL> insert into lab
  2  values(scanner_ty('103','SJT103','s01','HP scanner'));

1 row created.
```

Q3> Implement the following object-oriented diagram relating to assets in a computer laboratory. Execute insert statements for entering data into the

tables so created.

```
SQL> create or replace type authors_ty as object
  2  (
  3  name varchar2(20),
  4  address varchar2(20)
  5  )NOT FINAL
  6  /

Type created.

SQL> create or replace type courses_manual_Tty as object
  2  (
  3  ISBN number(5),
  4  title varchar2(20),
  5  year number(4)
  6  )NOT FINAL
  7  /

Type created.

SQL> create or replace type specifieds_in_Tty as object
  2  (
  3  author_T ref authors_ty,
  4  courses_manual_T ref courses_manual_Tty
  5  )
  6  /

Type created.
```

```
SQL> create type industry_based_Tty under authors_ty
  2  (
  3  company_name varchar2(20),
  4  company_address varchar2(20),
  5  company_size number(4)
  6  )NOT FINAL
  7  /

Type created.

SQL> create type academic_Tty under authors_ty
  2  (
  3  institution_name varchar2(20),
  4  instutite_address varchar2(20),
  5  no_of_students number(5)
  6  )NOT FINAL
  7  /

Type created.
```

```
SQL> create type chapter_Tty under courses_manual_Tty
  2  (
  3  chap_no number(2),
  4  chap_title varchar2(20),
  5  page_no number(4)
  6  )NOT FINAL
  7  /

Type created.

SQL> create type research_staff_Tty under academic_Tty
  2  (
  3  research_topic varchar2(20),
  4  research_director varchar2(20)
  5  )NOT FINAL
  6  /

Type created.
```

```
SQL> create table author_T of authors_ty;

Table created.

SQL> create table courses_manual_T of courses_manual_Tty;

Table created.
```

```
SQL> create table specified_in of specifieds_in_Tty;

Table created.

SQL> create table industry_based_T of industry_based_Tty;

Table created.

SQL> create table academic_T of academic_Tty;

Table created.

SQL> create table chapter_T of chapter_Tty;

Table created.

SQL> create table research_staff_T of research_staff_Tty;

Table created.

SQL> create table teaching_staff_T of teaching_staff_Tty;

Table created.

SQL> create table subject_T of subject_Tty;

Table created.
```

```
SQL> insert into author_T values(authors_ty('Navate','Delhi'));

1 row created.

SQL> insert into courses_manual_T values(courses_manual_Tty(1234,'Database',2010));

1 row created.

SQL> insert into specified_in values(
  2  (select ref(a) from author_T a where a.name='Navate'),
  3  (select ref(c) from courses_manual_T c where c.ISBN=1234));

1 row created.

SQL> insert into author_T values(industry_based_Tty('Navate','Delhi',
  2  'Wipro','Kolkata',4000));

1 row created.
```

```
SQL> insert into academic_T values(research_staff_Tty('Navate','Delhi','VIT','Vellore',
  2  40000,'Query optimization','Vishwanathan'));

1 row created.

SQL> insert into academic_T values(teaching_staff_Tty('Navate','Delhi','VIT','Vellore',
  2  40000,20,contact_va(8583887650,9883294537)));

1 row created.

SQL> insert into subject_T values(subject_Tty('ITA5008','DBMS','SJT207',null));

1 row created.
```

```
SQL> insert into author_T values(academic_Tty('Navate','Delhi','VIT','Vellore',40000));

1 row created.
```

```
SQL> insert into courses_manual_T values(chapter_Tty(1234,'Database',2010,6,'DBMS',2000));

1 row created.
```

Q4> Giant Travel is a well-known travel agency that operates guided tours. With offices around the world, they maintain accurate and detailed employee data. The employee data are kept in an object Employee_T and can be divided into two child objects: Guide_T and Admin_T. An employee can be categorized as a guide or an administration staff, but he or she can also be both. This is important because in the peak season, an administration worker might be needed to guide the tours and vice versa. The objects and the attributes are shown below.

```
SQL> create or replace type employee_Tty as object
  2  (
  3  id varchar2(5),
  4  name varchar2(20),
  5  address varchar2(20),
  6  salary number(6),
  7  member procedure insert_employee(id varchar2,name varchar2,address varchar2,
  8  salary number),
  9  member procedure delete_employee(idd varchar2)
 10  )NOT FINAL
 11  /

Type created.

SQL> create type guide_Tty under employee_Tty
  2  (
  3  language varchar2(10),
  4  country varchar2(20),
  5  member procedure insert_guide(language varchar2,country varchar2),
  6  member procedure delete_guide(idd varchar2)
  7  )NOT FINAL
  8  /

Type created.

SQL> create type admin_Tty under employee_Tty
  2  (
  3  comp_skills varchar2(20),
  4  office_skills varchar2(20),
  5  member procedure insert_admin(comp_skills varchar2,office_skills varchar2),
  6  member procedure delete_admin(idd varchar2)
  7  )NOT FINAL
  8  /

Type created.
```

```
SQL> create table employee_T of employee_Tty;

Table created.

SQL> create table guide_T of guide_Tty;

Table created.

SQL> create table admin_T of admin_Tty;

Table created.
```

```
SQL> create type body employee_Tty as
  2  member procedure insert_employee(id varchar2,name varchar2,address varchar2,
  3  salary number) is
  4  begin
  5  insert into employee_T values(id,name,address,salary);
  6  end insert_employee;
  7  member procedure delete_employee(idd varchar2) is
  8  begin
  9  delete from employee_T where id=idd;
 10  end delete_employee;
 11  end;
 12  /

Type body created.

SQL> create type body guide_Tty as
  2  member procedure insert_guide(id varchar2,name varchar2,address varchar2,
  3  salary number,language varchar2,country varchar2) is
  4  begin
  5  insert into guide_T values(id,name,address,salary,language,country);
  6  end insert_guide;
  7  member procedure delete_guide(idd varchar2) is
  8  begin
  9  delete from guide_T where id=idd;
 10  end delete_guide;
 11  end;
 12  /
```

```
SQL> create type body admin_Tty as
  2  member procedure insert_admin(id varchar2,name varchar2,address varchar2,
  3  salary number,comp_skills varchar2,office_skills varchar2) is
  4  begin
  5  insert into admin_T values(id,name,address,salary,comp_skills,office_skills);
  6  end insert_admin;
  7  member procedure delete_admin(idd varchar2) is
  8  begin
  9  delete from admin_T where id=idd;
 10  end delete_admin;
 11  end;
 12  /
```

```
SQL> insert into employee_T values(employee_Tty('e01','swarnali','kolkata',50000));

1 row created.

SQL> insert into employee_T values(guide_Tty('e01','swarnali','kolkata',50000,
  2  'english','india'));

1 row created.

SQL> insert into employee_T values(guide_Tty('e01','swarnali','kolkata',50000,
  2  'good','excellent'));

1 row created.
```

Q5> The following figure shows the relationship among objects Supervisor_T, Student_T, and Subject_T in a university. A student can take many subjects, and a subject can be taken by many students. For every subject a student takes, there is a mark given. In another relationship, a student can be supervised by only one supervisor, but a supervisor can supervise many students. Assume that objects have been created and the tables from these objects are shown.

```
SQL> create or replace type supervisor1_Tty as object
  2  (
  3  spv_id varchar2(5),
  4  spv_name varchar2(20),
  5  member procedure insert_spv(spv_id varchar2,spv_name varchar2),
  6  member procedure delete_spv(spv_idd varchar2)
  7  )
  8  /

Type created.
```

```
SQL> create or replace type subject1_Tty as object
  2  (
  3  subject_id varchar2(5),
  4  subject_name varchar2(20),
  5  member procedure insert_subject(subject_id varchar2,subject_name varchar2),
  6  member procedure delete_subject(subject_idd varchar2)
  7  )
  8  /

Type created.
```

```
SQL> create or replace type student2_Tty as object
  2  (
  3  student_id varchar2(5),
  4  supervisor_T ref supervisor1_Tty,
  5  student_name varchar2(20),
  6  member procedure insert_student(student_id varchar2,student_name varchar2),
  7  member procedure delete_student(student_idd varchar2)
  8  )
  9  /

Type created.
```

```
SQL> create or replace type enrolls1_in_ty as object
  2  (
  3  student2_T ref student2_Tty,
  4  subject1_T ref subject1_Tty
  5  )
  6  /

Type created.
```

```
SQL> create table supervisor_T of supervisor1_Tty;

Table created.
```

```
SQL> create table students_T of student2_Tty;

Table created.

SQL> create table subject1_T of subject1_Tty;

Table created.

SQL> create table enrollss_in of enrolls1_in_ty;

Table created.
```

```
SQL> create or replace type subject1_Tty as object
  2  (
  3  subject_id varchar2(5),
  4  subject_name varchar2(20),
  5  member procedure insert_subject(subject_id varchar2,subject_name varchar2),
  6  member procedure delete_subject(subject_idd varchar2)
  7  )
  8  /

Type created.

SQL> create or replace type enrolls1_in_ty as object
  2  (
  3  student2_T ref student_Tty,
  4  subject1_T ref subjects_Tty
  5  )
  6  /
```

```
SQL> create or replace type body supervisor1_Tty is
  2  member procedure insert_spv(spv_id varchar2,spv_name varchar2) is
  3  begin
  4  insert into supervisor_T values(spv_id,spv_name);
  5  end insert_spv;
  6  member procedure delete_spv(spv_idd varchar2) is
  7  begin
  8  delete from supervisor_T where spv_id=spv_idd;
  9  end delete_spv;
 10  end;
 11  /

Type body created.
```

```
SQL> create or replace type body student2_Tty is
  2  member procedure insert_student(student_id varchar2,student_name varchar2) is
  3  begin
  4  insert into students_T values(student_id,student_name);
  5  end insert_student;
  6  member procedure delete_student(student_idd varchar2) is
  7  begin
  8  delete from students_T where student_id=student_idd;
  9  end delete_student;
 10  end;
 11  /
```

```
SQL> create or replace type body subject1_Tty is
  2  member procedure insert_subject(subject_id varchar2,subject_name varchar2) is
  3  begin
  4  insert into subject1_T values(subject_id,subject_name);
  5  end insert_subject;
  6  member procedure delete_subject(subject_idd varchar2) is
  7  begin
  8  delete from subject1_T where subject_id=subject_idd;
  9  end delete_subject;
 10  end;
 11  /

Type body created.
```

```
SQL> insert into supervisor_T values(supervisor1_Tty('s01','Ram'));

1 row created.
```

```
SQL> insert into student_T values(student2_Tty('st01','madhu'));
```

```
SQL> create table enrolls_in of enrolls1_in_ty;

Table created.
```