

## CS 34800 Homework 5

Deadline for returning the HW: Monday April 2nd, 2012 at the end of the CS 34800 class.

Instructions. Print the homework and mark the reply on the homework.

Return the hard copy of the homework marked with the replies to the instructor at the end of the class.

- 1) (points 5) Consider the following object type definition expressed in the object-relational model of Oracle:

```
CREATE TYPE location_t AS OBJECT (  
    building_no  INTEGER PRIMARY KEY,  
    city         VARCHAR (40));
```

Is this object type definition correct? Reply YES or NO.

- 2) Consider the following object type definition and typed table definition expressed in the object-relational model of Oracle:

```
CREATE TYPE person_t AS OBJECT (  
    pid  INTEGER,  
    name VARCHAR (40),  
    phone INTEGER);
```

```
CREATE Table contacts (  
    Contact  person_t,  
    Contact_date  DATE);
```

- (a) (points 5) Is the following INSERT command correct? Reply YES or NO.  
INSERT INTO contacts VALUES (20, 'Smith', 7654645799, '23 April 2012');
- (b) (points 5) Is the following INSERT command correct? Reply YES or NO.  
INSERT INTO contacts VALUES (person\_t(NULL, NULL, NULL), '23 April 2012');
- (c) (points 5) Is the following INSERT command correct? Reply YES or NO.  
INSERT INTO contacts VALUES (NULL, '23 April 2012');

- 3) Consider the following object type definition and type table definitions expressed in the object relational model of Oracle:

```
CREATE TYPE employee_t AS OBJECT (  
    empn  INTEGER,  
    name  VARCHAR (40),  
    phone INTEGER);  
  
CREATE TABLE employees OF employee_t;  
CREATE TABLE foreign_employees OF employee_t;  
  
CREATE TABLE departments (  
    deptn  INTEGER,  
    dname  VARCHAR (40);  
    manager REF employee_t SCOPE IS employees);
```

- (a) (points 5) is the following update statement correct? Reply YES or NO.  
 UPDATE departments  
 SET manager = (SELECT empn FROM employees WHERE empn=100)  
 WHERE deptn = 50;
- (b) (points 5) is the following update statement correct? Reply YES or NO.  
 UPDATE departments  
 SET manager = (SELECT ref(d1) FROM foreign\_employees d1 WHERE empn=500)  
 WHERE deptn = 50;
- (c) (points 5) is the following update statement correct? Reply YES or NO.  
 UPDATE departments  
 SET manager = (SELECT ref(d1) FROM employees d1 WHERE empn=100)  
 WHERE deptn = 50;
- (d) (points 5) is the following update statement correct? Reply YES or NO.  
 UPDATE departments  
 SET manager = (SELECT value(d1) FROM employees d1 WHERE empn=100)  
 WHERE deptn = 50;

- 4) (points 10) Consider a set of suppliers (each characterized by a supplier INTEGER and a name) and assume that for each supplier we record the set of products supplied by the suppliers. Each product is characterized by a product INTEGER, a name, and a color. ***Each supplier provides more than one product.*** Suppose that we have defined the following object type (in the object-relational model of Oracle) to model products.

```
CREATE product_t AS OBJECT (
  pr_n  INTEGER,
  name  VARCHAR (20),
  color VARCHAR (20));
```

Consider now the following three definitions for creating the table suppliers expressed in the object-relational model of Oracle:

- (a) CREATE TABLE suppliers (  
     supp\_n INTEGER,  
     sname VARCHAR,  
     products REF product\_t);
- (b) CREATE TABLE suppliers (  
     supp\_n INTEGER,  
     sname VARCHAR,  
     products TABLE product\_t);
- (c) CREATE product\_list AS TABLE product\_t;  
 CREATE TABLE suppliers (  
     supp\_n INTEGER,  
     sname VARCHAR,  
     products product\_list)  
 NESTED TABLE products STORE AS product\_tab;

Which of the above definitions for creating the table suppliers are correct?

- (i) (a)
- (ii) (b)
- (iii) (c)
- (iv) Both (b) and (c)
- (v) None of the above

- 5) (10 points) Consider the following object type definitions and table definition expressed in the object relational-model of Oracle:

```
CREATE TYPE employee_t AS OBJECT (  
    empn  INTEGER,  
    name  VARCHAR (40),  
    phone INTEGER)  
NOT FINAL;  
CREATE TYPE junior_emp_t UNDER employee_t (  
    years  INTEGER,  
    stage  VARCHAR (40));
```

```
CREATE TABLE employees OF employee_t (  
    PRIMARY KEY(empn));
```

Suppose that we wish to retrieve from table employees all junior employees. Does the following query correctly retrieve the required data? Reply YES or NO

```
SELECT * FROM employees e WHERE VALUE(e) IS OF (junior_emp_t);
```

- 6) Consider the object types employee\_t and junior\_emp\_t created in question (5) above.
- (a) (5 points) Can we create a subtype of the junior\_emp\_t type? Reply YES or NO?
  - (b) (5 points) Can we create a subtype of the employee\_t type in addition to subtype junior\_emp\_t? Reply YES or NO?

- 7) (10 points) Consider the table created by the following command using the object types and table definition in question (5) above:

```
CREATE projects (  
    pname VARCHAR (40),  
    manager REF employee_t SCOPE IS employees  
    COLUMN manager IS OF (ONLY employee_t);  
Is the following update statement correct? Reply YES or NO.
```

```
UPDATE projects  
SET manager = REF (junior_emp_t(200, 'Mary Black', 4963567, 3, 'DBSEC'));
```

- 8) (10 points) Consider the following query expressed on table employees defined in question (5) above:

```
SELECT e.name, TREAT(VALUE(e) AS junior_emp_t).stage FROM employees e WHERE  
empn='100';
```

Suppose that the employee with empn equal to 100 is not a junior employee and suppose that his name is Smith. What is the result of this query?

- (a) The query is empty.
- (b) (Smith, NULL).

9) (10 points) Consider the following query expressed on table employees defined in question (5) above:

```
SELECT e.name, e.years FROM employees e WHERE empn='200' AND VALUE(e) IS OF  
(junior_emp_t);
```

Suppose that the employee with empn equal to 200 is a junior employee. Is this query correct? Reply YES or NO.