Database Systems

Laboratory Worksheet 2

Year 3 – SE Batch

Create and Query Object Relational Tables

1. Consider the schema of the following two relational tables:

EMP (Employee Table)

COL NAME	TYPE	SIZE	NULL	DESCRIPTION
EMPNO	CHAR	6	no	Employee number, unique
FIRSTNAME	VARCHAR	12	no	First name
LASTNAME	VARCHAR	15	no	Last name
WORKDEPT	CHAR	3		Employee's dept number
SEX	CHAR	1		M=male, F=female
BIRTHDATE	DATE			Date of birth
SALARY	NUMBER	(8,2)		Annual salary

DEPT (Department Table)

COL NAME	TYPE	SIZE	NULL	DESCRIPTION
DEPTNO	CHAR	3	no	Department number, unique
DEPTNAME	VARCHAR	36	no	Department name
MGRNO	CHAR	6		Dept manager's employee no.
ADMRDEPT	CHAR	3		ID of administrative dept

(a) Define object types emp_t and dept_t with attributes of EMP and DEPT respectively. Use REF types for workdept (of EMP), and mgrno and admrdept (of DEPT).

(b) Create tables (named as OREMP and ORDEPT) using the object types defined in (a), with appropriate primary keys and referential constraints.

(c) Insert data into the object relational tables created in (b), using the data in EMP and DEPT tables given below. (First insert rows into oremp with null for workdept and rows into ordept with null for admrdept. Then update oremp and ordept with actual REF values for workdept and admrdept.)

EMP:

```
EMPNO  FIRSTNAME     LASTNAME      WORKDEPT SEX BIRTHDATE     SALARY
-------------------------------------------------------------------
000010 CHRISTINE     HAAS             A00   F 14/AUG/53       72750
000020 MICHAEL       THOMPSON         B01   M 02/FEB/68       61250
000030 SALLY         KWAN             C01   F 11/MAY/71       58250
000060 IRVING        STERN            D01   M 07/JUL/65       55555
000070 EVA           PULASKI          D01   F 26/MAY/73       56170
000050 JOHN          GEYER            C01   M 15/SEP/55       60175
000090 EILEEN        HENDERSON        B01   F 15/MAY/61       49750
000100 THEODORE      SPENSER          B01   M 18/DEC/76       46150
```

DEPT:

DEPTNO	DEPTNAME	MGRNO	ADMRDEPT
A00	SPIFFY COMPUTER SERVICE DIV.	000010	A00
B01	PLANNING	000020	A00
C01	INFORMATION CENTRE	000030	A00
D01	DEVELOPMENT CENTRE	000060	C01

2. Answer the following queries using OREMP and ORDEPT tables:

   (a) Get the department name and manager's lastname for all departments.

   (b) Get the employee number, lastname and the department name of every employee.

   (c) For each department, display the department number, department name, and name of the administrative department.

   (d) For each department, display the department number, department name, the name of the administrative department and the last name of the manager of the administrative department.

   (e) Display the employee number, firstname, lastname and salary of every employee, along with lastname and salary of the manager of the employee's work department.

   (f) Show the average salary for men and the average salary for women for each department. Identify the department by both department number and name.

3.

   (a) Save the queries of Exercise 2 into a text file and save it in your z: drive with extension *.sql.
   e.g. Z:\script.sql

```
-- This is an example SQL query script
-- Comments start with '--'
SELECT * FROM OREMP
/
SELECT D.DEPTNO, D.DEPTNAME
FROM ORDEPT D
/
DELETE ORDEPT D
WHERE D.DEPTNAME = 'C01'
/
```

   Note: Queries in a script does not end with a semicolon (;) instead you will see a forward slash (/) at the end of each query

   (b) Execute the SQL script as follows and study the result.

```
SQL>@Z:\script
```

   (c) Set **echo** on and execute the script again and compare the result with the result you got in the previous step. Try to understand what would happen when you set **echo** on and off.

```
SQL>set echo on
SQL>@Z:\script
```

   (d) Set **termout** off and execute the script again and compare the result with the results you got in the previous steps. Try to understand what would happen when you set **termout** on and off.

```
SQL>set termout on
SQL>@Z:\script
```

(e) Set termout off and echo on and run the script on Oracle with spooling. Then open the spooled file in a text editor and study it.

```
SQL>set termout off
SQL>set echo on
SQL>spool z:\prac2.out
SQL>@Z:\script
SQL>spool off
```

Note:

- By spooling you can direct the output of the SQLPlus editor into a file. So that, you can study it later.
- When you perform a time consuming process; you may set termout off and echo on and then run the script to perform the process. So that the script would run as a background process. You can later study the output file.
- **echo** and **termout** are NOT commands to the database. They are environment variables available in SQLPlus editor. You can see all environment variables as follows.

```
SQL>show all
SQL>show echo
SQL>show termout
```

4. To drop mutually dependent types, use:

```
Drop type type_name FORCE;
```

To drop mutually dependent tables, use:

```
Drop table table_name cascade constraint;
```