East West University
Department of Computer Science and Engineering

CSE 302: LAB 01 (Handout)
Course Instructor: Mahmuda Rawnak Jahan

Introduction to Oracle Database XE and SQLPlus Tool for writing SQL queries

Lab Objective

Familiarize students with Oracle database and SQLPlus tool for writing queries in SQL.

Lab Outcome

After completing this lab successfully, students will be able to:

1. **Install** and **Use** Oracle database 18c Express Edition and SQLPlus tool for writing queries.
2. **Write** SQL statements to perform most common and basic database operations.

Psychomotor Learning Levels

This lab involves activities that encompass the following learning levels in psychomotor domain.

Level	Category	Meaning	Keywords
P1	Imitation	Copy action of another; observe and replicate.	Relate, Repeat, Choose, Copy, Follow, Show, Identify, Isolate.
P2	Manipulation	Reproduce activity from instruction or memory	Copy, response, trace, Show, Start, Perform, Execute, Recreate.

Lab Activities

1. Introducing Oracle Database XE

Oracle Database 18c Express Edition (Oracle Database XE) is a free, smaller-footprint edition of Oracle Database. Oracle Database XE is easy to install and easy to manage. With Oracle Database XE and related tools you can:

- Administer the database. Create tables, views, and other database objects
- Import, export, and view table data and Run queries and SQL scripts

You can also install Oracle 11g Express Edition if 18c is not supported in your machine. Mostly, Windows 10 Home Edition doesn't support 18c. In that case, install 11g XE edition.

2. Executing SQLPlus tool:

SQLPlus is the most basic Oracle Database utility, with a basic command-line interface, commonly used by users, administrators, and programmers. Follow these steps to execute theSQLPlus tool. i. Open a command prompt.

ii. Type **`sqlplus`**

iii. Then enter **`system`** as user-name

iv. And enter **`your password`** *[you have given this password at the time of installation]*

3. Creating a Common Database User:

To perform database operations, you have to create a common user. Follow these steps to create a common user. **The username must start with c## in Oracle 18c.** *In case of 11g, you do not need to put c## at the beginning.*

i. Type **`create user <username> identified by <password>;`** **ii.** Type **`GRANT RESOURCE, CONNECT, CREATE SESSION, CREATE TABLE, CREATE VIEW, CREATE ANY TRIGGER, CREATE ANY PROCEDURE, CREATE SEQUENCE, CREATE SYNONYM, UNLIMITED TABLESPACE TO <username>;`**

4. Connecting to the Database at Local Machine:

After successfully creating a database user lab, you could connect to the database in the following way: **`connect <username>/<password>`**

To see the list of already created tables by any user:

```
select table_name from user_tables;
```

5. Creating a Table:

The general syntax for creating a table is given below.

```
CREATE TABLE table_name
       (attribute1 datatype [ NULL | NOT NULL ],
        attribute2 datatype [ NULL | NOT NULL ],
       ...);
```

There exist different data types in Oracle. Some of them are given below.

- **`char(n)`**: value contains exactly n alpha-numeric characters
- **`varchar2(n)`**: value contains at most n alpha-numeric characters
- **`number`**: any integer or real numbers
- **`date`**: DD-MON-YY format like '20-JAN-15'

Assume that you want to create a table named **person** with three attributes which are given below:

i. personId: number type
ii. personName: varchar2 type
iii. personDOB: date type

To create this table, you must write the following query

```
create table person (
 personId number not null,
 personName varchar2(50) not null,
 personDOB date
 );
```

6. Inserting Records/Rows into a Table:

The general format of inserting a new record is:

```
insert into table_name values (…,…,…);
```

Now type the following to insert a new record into **person** table.

```
insert into person values (2018001,'Alice','01-JAN-92');
```

7. Writing Queries:

The basic SQL syntax of a query is given below.

```
select attribute1, attribute2
from table_name
where <conditional clause> ;
```

To find only the person id of all persons from person table, you have to type the following:

```
select personId from person;
```

8. Executing SQL Script in SQLPlus:

You can create a file with a.sql extension that contains your SQL statements. Then you can execute it from the SQLPlus command line directly.

Suppose, you have written your SQL statements in a file ‘lab1.sql’ saved under d:\sampledirectory. To execute that script, you must type

```
@ d:\sample\lab1.sql
```

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You must write all SQL statements in notepad first and save them with .sql extension. Then execute your SQL scripts.

Lab Task # 01 (Creating a table):

1.(a). Write SQL statement to create a table 'instructor_your_student_id' which has 4 attributes
– i) id (number)
ii) name (text)
iii) dept_name (text)
iv) salary (number)

Example: `create table instructor_2020360001 ( ..... );`

1.(b). Write SQL statement to create a table 'course_your_student_id' which has 4 attributes
– i) course_id (text)
ii) title (text)
iii) dept_name (text)
iv) credits (number)

Example: `create table course_2020360001 ( ..... );`

Lab Task # 02 (Inserting data into a table):

2.(a). Write SQL statements to insert following records into 'instructor_your_student_id' table:

ID	*name*	*dept_name*	*salary*
10101	Srinivasan	Comp. Sci.	65000
12121	Wu	Finance	90000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
32343	El Said	History	60000
33456	Gold	Physics	87000
45565	Katz	Comp. Sci.	75000
58583	Califieri	History	62000
76543	Singh	Finance	80000
76766	Crick	Biology	72000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000

2.(b). Write SQL statements to insert the following records into ‘course_your_student_id’ table:

course_id	*title*	*dept_name*	*credits*
BIO-101	Intro. to Biology	Biology	4
BIO-301	Genetics	Biology	4
BIO-399	Computational Biology	Biology	3
CS-101	Intro. to Computer Science	Comp. Sci.	4
CS-190	Game Design	Comp. Sci.	4
CS-315	Robotics	Comp. Sci.	3
CS-319	Image Processing	Comp. Sci.	3
CS-347	Database System Concepts	Comp. Sci.	3
EE-181	Intro. to Digital Systems	Elec. Eng.	3
FIN-201	Investment Banking	Finance	3
HIS-351	World History	History	3
MU-199	Music Video Production	Music	3
PHY-101	Physical Principles	Physics	4

Lab Task # 03 (Writing Queries):

I. Show instructor name only.
II. Show course id and title only.
III. Find instructor name and department of the instructor with id = 22222.
IV. Find course title and credits of the courses offered by ‘Comp. Sci.’ department.
V. Find name and department of instructors who have a salary more than 70000.
VI. Find course title of the courses which are not less than 4 credits.
VII. Find name and department of instructors who have a salary in between 80000 and 100000 (bounds are inclusive).
VIII. Find course titles and credits of the courses not offered by ‘Comp. Sci.’ department.
IX. Display all records of instructor table.
X. Find all courses (display all columns) which are offered by ‘Biology’ department and credits is not 4.

Submission

Take screenshots of the execution and result of your queries in SQLPlus Tool and insert the captured image in a doc file for each and every question . Submit both doc and sql file in the given submission link in the Classroom. Submit files separately. Name the file as per the following format: 2022-1-60-001_LAB01.docx and 2022-1-60-001_LAB01.sql.