Oracle Lab 2:SQL DDL and DML

CSE 312 Database Systems

Pre-Condition: SQL*Plus Login

Creating Table Structure (DDL)

1. Create a *Student* table with necessary integrity constraint:

```
create table student(
        studid    varchar2(13),
        studname varchar2(50) not null,
        email varchar2(100) default 'info@diu.edu.bd',
        constraint pk_stud primary key (studid));
```

   where **constraint** is a keyword used for imposing either column level constraint or table level constraint. The column or domain constraints are **not null**, **unique**, **primary key**, **foreign key**, **check**, **deafult**. The *constraint* can have a name, which is optional.

2. To display the physical structure of the table:

```
desc student
```

3. Create a *department* table with necessary integrity constraint:

```
create table department(
        deptid    varchar2(3),
        deptname varchar2(30),
        Constraint pk_dept Primary key (deptid));
```

4. To display the physical structure of the department table:

```
desc department
```

5. Create a *course* table with *courseid* as the primary key and *deptid* as the foreign key from the *department* table:

```
create table course(
        courseid        varchar2(12),
        deptid          varchar2(3) not null,
        title           varchar2(60) not null,
        credits         number(3,1),
        Constraint pk_crs Primary key (courseid, deptid),
        Constraint fk_crs_dept Foreign key (deptid) references department (deptid));
```

   A constraint is a mechanism, which ensures that the values of a column or a set of columns satisfy a declared condition. Foreign key is always a primary key of another table. The columns in the referenced table must actually compose the primary or unique key of the referenced table. The *Constraint* is a keyword used for imposing restrictions wither on a particular column or on the whole table. The name of the constraint is optional but it is useful to monitor all the created objects.

6. Create a *instructor* table with the necessary constraints:

```
Create table instructor(
        instid          varchar2(12),
        deptid          varchar2(3)     not null,
        instname        varchar2(50)    not null,
        designation     varchar2(30)    constraint CK_inst
        Check  (designation in ('Asstt Professor', 'Associate Professor',  'Professor')),
        email           varchar2(100)   default 'info@diu.edu.bd',
        Constraint pk_inst Primary key (instid),
        Constraint fk_inst_dep Foreign key (deptid) references department (deptid) );
```

The *Default* value is used for a column whenever a row is inserted into the table without specifying the column in the INSERT statement.

The *Check* clause is a Boolean condition that is either true or false. If the condition evaluates to TRUE, the column value is accepted by Oracle; if the condition is evaluates to FALSE, Oracle will return an error code.

The above table allows instructors designation to be one of three values – Assistant Professor, Associate Professor and Professor.

7. To display the structure of the table *instructor*:
   desc instructor

Altering Table Structure (DDL)

8. Changing a column definition from *not null* to *null*:
   alter table student modify (studname varchar2(50) null);

9. To see the structure of the table *student*:
   desc student

10. Changing a column definition from *null* to *not null*:
    alter table student modify (studname varchar2(50) not null);

11. To see the structure of the table *student*:
    desc student

12. Increasing a column's width:
    alter table student modify (studname varchar2(60) not null);

13. To see the structure of the table *student*:
    desc student

14. Deleting the Primary key from the table *department*:
    alter table department drop primary key;

15. To see the structure of the table *department*:
    desc department

16. Adding Primary key for the table *department*:
    alter table department add constraint pk_dept primary key (deptid);

17. To see the structure of the table *department*:
    desc department

18. Deleting the foreign key from the table *course*:
    alter table course drop constraint fk_crs_dept;

    The deletion of the foreign key constraint requires the keyword *constraint* and the name of the foreign key constraint that has to be deleted since there could be more than one foreign key in a table but a table has got only one primary key.

19. To see the structure of the table *course*:
    desc course

20. Adding foreign key for the table *course*:
    a*lter table course add Constraint fk_crs_dept Foreign key (deptid) references department (deptid));*

21. To see the structure of the table *course*:
    desc course;

Inserting some Rows of Information (DML)

22. Insert row of information in the *student* table:
    insert into student(studid, studname) values('161-15-001','Charles Babbage');
    insert into student(studid, studname) values('152-15-002','Alan Turing');
    insert into student values('161-15-003','Tim Berners Lee','tim@diu.edu.bd');

23. Display all the rows from the table *student*:
    *Select * from student;*

24. Display all the rows for the student *Tim BernersLee*:
    *Select * from student where studid='161-15-003';*

25. Display the *name* and *email* of the student holding the ID#1999-1-20-001:
    Select studname, email from student where studid='161-15-001';

26. Insert the following row of information in the *student* table:
    Insert into student(studid, studname) values('161-15-002', 'Von Neumaan');

    Please take note of the error message generated by the Oracle:
    >>

27. Display the detail information of the student whose student ID is '161-15-002':
    Select stud, name, email from student where studid='161-15-002';

    Please take note of the error message generated by the Oracle:
    >>

    Correct form of the SQL instruction:
    >>

---------- End of Session 2 ----------