CHAPTER-1-DATABASE MANAGEMENT SYSTEM

Letus discuss each in detail:

1. After Table Command:-This command is used to modify the base table definition. The modifications that can be done using this command are:

- *Adding a column*: Suppose we want to add a column Age in the Teacher table. Following command is used to add the column:

  `ALTER TABLE Teacher ADD Age INTEGER;`

- *Dropping a column*: A column can be dropped using this command but one must specify the options (RESTRICT or CASCADE) for the drop behavior. As discussed earlier, RESTRICT would not let the column be dropped if it is being referenced in other tables and CASCADE would drop the constraint associated with this column in this relation as well as all the constraints that refer this column.

  `ALTER TABLE Teacher DROP Dept_No CASCADE;`

This will drop the Dept_No column in the Teacher Table and it would also drop the foreign key constraint TEACHER_FK as it uses this column. As stated earlier, RESTRICT and CASCADE options are not supported in MySQL server 5.6.20. Hence it will not allow to drop a column if it is referred anywhere else. The MySQL command to drop Age Column from Teacher is:

  `ALTER TABLE Teacher DROP Age;`

- *Altering a Column*: A column definition can also be altered. For example – dropping the default value or defining a new default value. For example, in the Teacher table the default value of Salary is 40000. If you want to drop this default value or change this value to 30000 then it can be done by using the following commands:

  `ALTER TABLE Teacher ALTER Salary DROP DEFAULT;`
  `ALTER TABLE Teacher ALTER Salary SET DEFAULT 30000;`

- *Dropping keys*: A foreign key/primary key/key can be dropped by using ALTER TABLE command. For example if you want to delete the foreign key TEACHER_FK in the Teacher table then following command can be used:

  `ALTER TABLE Teacher DROP FOREIGN KEY TEACHER_FK;`

- *Adding a Constraint*: If you want to add the foreign key constraint TEACHER_FK back, then the command would be:

  `ALTER TABLE Teacher ADD CONSTRAINT TEACHER_FK FOREIGN KEY (Dept_No) REFERENCES Department(Dept_ID) ON DELETE SET NULL ON UPDATE SET NULL;`

2. ***Insert Command***: This command is used to insert a tuple in a relation. We must specify the name of the relation in which tuple is to be inserted and the values. The values must be in the same order as specified during the Create Table command. For example, consider the following table Teacher:

```
CREATE TABLE Teacher
(
Teacher_ID INTEGER,
First_Name VARCHAR(20) NOT NULL,
Last_Name VARCHAR(20),
Gender CHAR(1),
Salary DECIMAL(10,2) DEFAULT 40000,
Date_of_Birth DATE,
Dept_No INTEGER,
CONSTRAINT TEACHER_PK PRIMARY KEY (Teacher_ID),
);
```

To insert a tuple in the Teacher table INSERT command can be used as shown below: INSERT INTO Teacher

```
VALUES (101,"Shanaya", "Batra", 'F', 50000, '1984-08-11', 1);
```

Note that the values listed above are in the same order of the attributes as specified in the Create Table command. Another form of INSERT command is used to insert a tuple in which the ordering of values is done by explicitly specifying the attribute names as shown below:

```
 INSERT INTO Teacher (First_Name, Last_Name, Gender,
Teacher_ID, Date_of_Birth, Dept_No, Salary)
VALUES ("Shanaya", "Batra", 'F', 101, '1984-08-11', 1,
50000);
```

Note that the values entered are ordered with respect to the attributes mentioned. If an attribute value is not explicitly specified its DEFAULT value is used. If DEFAULT value is also not specified then NULL value is used. Thus in the above example if salary was not specified in the INSERT command, then its default value i.e.40000 as given in the table creation command would have been used as shown below.

```
INSERT INTO Teacher (First_Name, Last_Name, Gender,
Teacher_ID, Date_of_Birth, Dept_No, Salary)
VALUES ("Shanaya", "Batra", 'F', 101, '1984-08-11'1,);
```

3. ***Update Command*** : This command is used to update the attribute values of one or more tuples in a table. For example in the Teacher table, we want to update the Salary of teacher with Teacher_ID=101 to 55000. This can be done using the following command:

```
UPDATE Teacher
SET Salary=55000
WHERE Teacher_ID=101;
```

We can also have an algebraic expression in the SET clause. Suppose it is required to increase the salary of a Teacher Shanaya by 5000, the command would be:

```
UPDATE Teacher
SET Salary=Salary+5000
WHERE Teacher_Name="Shanaya";
```

4. ***Delete Command***:- In order to delete one or more tuples, DELETE command is used. If we want to delete the tuple for Teacher with ID=101 the command would be:

```
DELETE FROM Teacher
WHERE Teacher_ID=101;
```

If the WHERE clause is missing then it will delete all the tuples in a table as shown below:

```
DELETE FROM Teacher;
```

5. **_Select Command_** :- The SELECT Command is used to retrieve information from a database. There are various ways in which the SELECT command can be used. Syntax of

```
SELECT Command is as follows:
SELECT <attribute list>
FROM <table  list>
WHERE <condition>
```

The basic structure of a SELECT command comprises of the keyword SELECT followed by the attribute list (separated by comma (,)) you want to select, followed by FROM clause followed by the table name and lastly an optional WHERE clause which is followed by a condition that can be a Boolean expression or another SELECT command that identifies the tuples to be selected.
Consider the following tables in the School Database for all the queries that follow:

```
CREATE TABLE Department
 (
Dept_ID INTEGER PRIMARY KEY,
Dept_Name VARCHAR(30) NOT NULL
);
CREATE TABLE Teacher
(
Teacher_ID INTEGER,
First_Name VARCHAR(20) NOT NULL,
Last_Name VARCHAR(20),
Gender CHAR(1),
Salary DECIMAL(10,2) DEFAULT 40000,
Date_of_Birth DATE,
Dept_No INTEGER,
CONSTRAINT TEACHER_PK PRIMARY KEY (Teacher_ID),
CONSTRAINT TEACHER_FK FOREIGN KEY (Dept_No) REFERENCES
Department (Dept_ID)
);
```

RAUSHAN DEEP

PGT (IT)

24.05.20XX