

DBMS/SQL

Lesson 08 Data Manipulation
Language

Lesson Objectives

- To understand the following topics:
 - Adding Data
 - Removing Data
 - Modifying Data



8.1: Concept of Data Manipulation Language

Data Manipulation Language

- Data Manipulation Language (DML) is used to perform the following routines on database information:
 - Retrieve
 - Insert
 - Modify
- DML changes data in an object. If you insert a row into a table, that is DML.
- All DML statements change data, and must be committed before the change becomes permanent.

8.1: Addition of Data into Tables

INSERT

- **INSERT command:**

- INSERT is a DML command. It is used to add rows to a table.
- In the simplest form of the command, the values for different columns in the row to be inserted have to be specified.
- Alternatively, the rows can be generated from some other tables by using a SQL query language command.



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Addition of Data into Tables:

Requisites for using INSERT command:

- If values are specified for all columns in the order specified at creation, then col_names could be omitted.
- Values should match "data type" of the respective columns.
- Number of values should match the number of column names mentioned.
- All columns declared as NOT NULL should be supplied with a value.
- Character strings should be enclosed in quotes.
- Date values should be enclosed in quotes.
- Values will insert one row at a time.
- Query will insert all the rows returned by the query.
- The table_name can be a "table" or a "view". If table_name is a "view", then the following restrictions apply:
 1. The "view" cannot have a GROUP BY, CONNECT BY, START WITH, DISTINCT, UNION, INTERSECT, or MINUS clause or a join.
 2. If the "view" has WITH CHECK OPTION clause, then a row, which will not be returned by the view, cannot be inserted.

8.1: Addition of Data into Tables

Inserting Rows into a Table

- Inserting by specifying values:
- Example: To insert a new record in the DEPT table

```
INSERT INTO table_name[(col_name1,col_name2,...)]  
{VALUES (value1,value2,...) | query};
```

```
INSERT INTO Department_master  
VALUES (10, 'Computer Science');
```



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Inserting Rows into a Table:

Example:

- Inserting a row in EMP table giving all values.

```
INSERT INTO student_master  
VALUES(1001,'Amit',10,'11-Jan-80','Chennai');
```

- 10 is a dept number which exists in DEPARTMENT_MASTER table

- Inserting a row in STAFF_MASTER table giving some values.

```
INSERT INTO staff_master  
(staff_code,staff_name,design_code,dept_code)  
VALUES(100001,'Arvind',102,30);
```

- This row will be created if all the constraints like NOT NULL are satisfied.

8.1: Addition of Data into Tables

Inserting Rows into a Table

- Inserting rows in a table from another table using Subquery:
- Example: The example given below assumes that a new_emp_table exists. You can use a subquery to insert rows from another table.

```
INSERT INTO new_staff_table  
SELECT * FROM staff_master  
WHERE staff_master.hiredate > '01-jan-82';
```

8.1: Addition of Data into Tables

Inserting Rows into a Table

- Inserting by using “substitution variables”:
- Example: In the example given below, when the command is run, values are prompted every time.

```
INSERT INTO department_master  
VALUES (&dept_code, '&dept_name');  
Enter a value for dept_code : 20  
Enter a value for dept_name : Electricals
```



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Inserting Rows into a Table:

Inserting by using “substitution variables”:

- The problem with the INSERT statement is that it adds only “one row” to the table.
- However, by using “substitution variables” the speed of data input can be increased.
- Whenever a “substitution variable” is placed in a “value” field, the user will be prompted to enter the “actual value” when the command is executed.

8.2: Deletion of Data from Tables

DELETE

- The DELETE command is used to delete one or more rows from a table.
- The DELETE command removes all rows identified by the WHERE clause.

```
DELETE [FROM] {table_name | alias }  
[WHERE condition];
```



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Deletion of Data from Tables

- The table_name can be a "table" or a "view".
- The DELETE command is used to delete one or more rows from a table.
- The DELETE statement removes all rows identified by the WHERE clause.
 - This is another DML, which means we can rollback the deleted data, and that to make our changes permanent.
- If WHERE clause is omitted, all rows from the table are removed. Else all rows which satisfy the condition are removed.
- FROM clause can be omitted without affecting the statement.

8.2: Deletion of Data from Tables

Deleting Rows from Table

- Example 1: If the WHERE clause is omitted, all rows will be deleted from the table.
- Example 2: If we want to delete all information about department 10 from the Emp

```
DELETE  
FROM staff_master;
```

```
DELETE  
FROM student_master  
WHERE dept_code=10;
```



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Deletion of Data from Tables

Example 3:

```
DELETE staff_master WHERE staff_name = 'Anil';
```

8.3: Modifying / Updating existing Data in a Table

UPDATE

- Use the UPDATE command to change single rows, groups of rows, or all rows in a table.
- In all data modification statements, you can change the data in only “one table at a time”.

```
UPDATE table_name
SET col_name = value|
    col_name = SELECT_statement_returning_single_value|
    (col_name,...) = SELECT_statement
[WHERE condition];
```



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Modifying / Updating existing Data in a Table:

- The table_name can be a “table” or a “view”.
- The “value” can be a value, an expression, or a query, which returns a single value.
- The UPDATE command provides automatic navigation to the data.
- **Note:** If the WHERE clause is omitted, all rows in the table will be updated by a value that is currently specified for the field. Else only those rows which satisfy the condition will be updated.

8.3: Modifying / Updating existing Data in a Table

Updating Rows from Table

- Example 1: To UPDATE the column “dname” of a row, where deptno is 10, give the following command:

```
UPDATE department_master  
SET dept_name= 'Information Technology'  
WHERE dept_code=10;
```

8.3: Modifying / Updating existing Data in a Table

Updating Rows from Table

- Example 2: To UPDATE the subject marks details of a particular student, give the following command:

```
UPDATE student_marks  
SET subject1= 80 , subject2= 70  
WHERE student_code=1005;
```

8.3: Modifying / Updating existing Data in a Table

Using a Subquery to do an Update

- For making salary of “Anil” equal to that of staff member 100006, use the following command:

```
UPDATE staff_master  
SET staff_sal = (SELECT staff_sal FROM staff_master  
                WHERE staff_code = 100006 )  
WHERE staff_name = 'Anil';
```

Summary

- In this lesson, you have learnt:
 - The concept of Data Manipulation Language
 - Inserting rows into a table
 - Deleting rows from a table
 - Updating rows in a table



Review - Questions

- Question 1: Both TRUNCATE statement and DELETE without condition removes the entire data from a table
 - True/False
- Question 2: All DML statements are auto committed
 - True/False
- Question 3: Inserting rows in a table emp1 from another table can be done using _____.
 - Option 1: insert into emp1(t1) as select empno from emp
 - Option 2: insert into emp1(t1) select empno from emp
 - Option 3: insert into emp1(t1) as select * from emp

