DML (Data Manipulation Language)

The SQL commands that deal with the manipulation of data present in the database belong to DML or Data Manipulation Language and this includes most of the SQL statements.

Examples of DML:

- INSERT – is used to insert data into a table.
- UPDATE – is used to update existing data within a table.
- DELETE – is used to delete records from a database table.

• INSERT INTO:

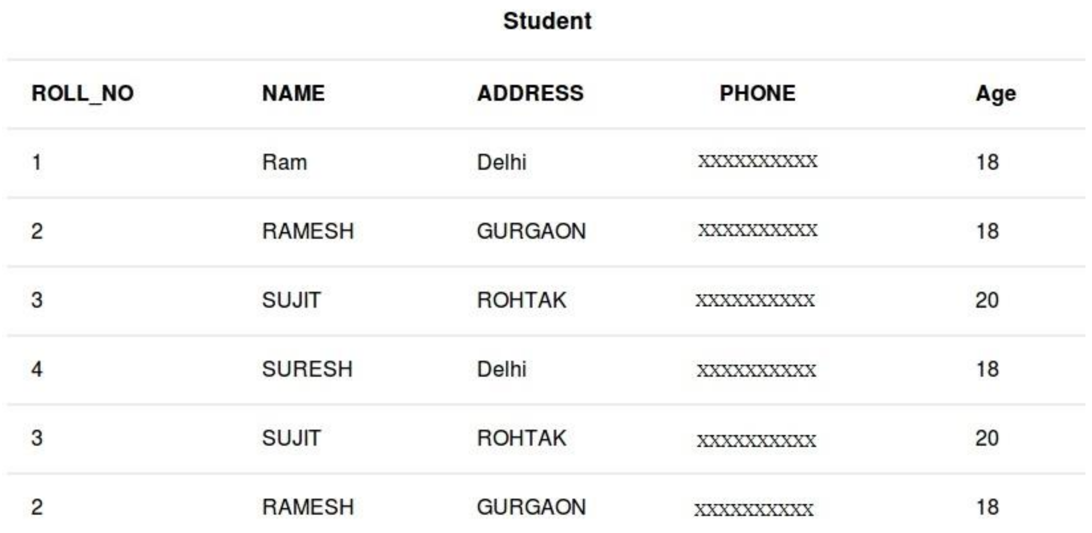
The INSERT INTO statement of SQL is used to insert a new row in a table. There are two ways of using INSERT INTO statement for inserting rows:

1. **Only values:** First method is to specify only the value of data to be inserted without the column names.

INSERT INTO table_name VALUES (value1, value2, value3,…);
table_name: *name of the table.*
value1, value2,.. *: value of first column, second column,… for the new record*

2. **Column names and values both:** In the second method we will specify both the columns which we want to fill and their corresponding values as shown below:

INSERT INTO table_name (column1, column2, column3,..) VALUES (value1, value2, value3,..);
table_name: *name of the table.*
column1: *name of first column, second column …*
value1, value2, value3 *: value of first column, second column,… for the new record*



Student

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18

Queries:

Method 1 (Inserting only values) :

INSERT INTO Student VALUES (‘5’,’HARSH’,’WEST BENGAL’,’XXXXXXXXXX’,’19’);

Output:
The table **Student** will now look like:

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18
5	HARSH	WEST BENGAL	XXXXXXXXXX	19

Method 2 (Inserting values in only specified columns):

INSERT INTO Student (ROLL_NO, NAME, Age) VALUES (‘5’,’PRATIK’,’19’);

Output:
The table **Student** will now look like:

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18

ROLL_NO	NAME	ADDRESS	PHONE	Age
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18
5	PRATIK	null	null	19

Notice that the columns for which the values are not provided are filled by null. Which are the default values for those columns.

Using SELECT in INSERT INTO Statement

We can use the SELECT statement with INSERT INTO statement to copy rows from one table and insert them into another table. The use of this statement is similar to that of INSERT INTO statement. The difference is that the SELECT statement is used here to select data from a different table. The different ways of using INSERT INTO SELECT statement are shown below:

- **Inserting all columns of a table:** We can copy all the data of a table and insert into in a different table.

INSERT INTO first_table SELECT * FROM second_table;

first_table*: name of first table.*
second_table*: name of second table.*

We have used the SELECT statement to copy the data from one table and INSERT INTO statement to insert in a different table.

- **Inserting specific columns of a table:** We can copy only those columns of a table which we want to insert into in a different table.
  Syntax:

INSERT INTO first_table(names_of_columns1) SELECT names_of_columns2 FROM second_table;
first_table*: name of first table.*
second_table*: name of second table.*

***names of columns1**: name of columns separated by comma(,) for table 1.*
***names of columns2**: name of columns separated by comma(,) for table 2.*

We have used the SELECT statement to copy the data of the selected columns only from the second table and INSERT INTO statement to insert in first table.

- **Copying specific rows from a table**: We can copy specific rows from a table to insert into another table by using WHERE clause with the SELECT statement. We have to provide appropriate condition in the WHERE clause to select specific rows.

INSERT INTO table1 SELECT * FROM table2 WHERE condition;
***first_table**: name of first table.*
***second_table**: name of second table.*
***condition:** condition to select specific rows.*

Table2: LateralStudent

ROLL_NO	**NAME**	**ADDRESS**	**PHONE**	**Age**
7	SOUVIK	DUMDUM	XXXXXXXXXX	18
8	NIRAJ	NOIDA	XXXXXXXXXX	19
9	SOMESH	ROHTAK	XXXXXXXXXX	20

Queries:

- **Method 1(Inserting all rows and columns):**

*INSERT INTO Student SELECT * FROM LateralStudent;*

Output:
This query will insert all the data of the table LateralStudent in the table Student. The table Student will now look like,

ROLL_NO	**NAME**	**ADDRESS**	**PHONE**	**Age**
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20

ROLL_NO	NAME	ADDRESS	PHONE	Age
4	SURESH	Delhi	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18
7	SOUVIK	DUMDUM	XXXXXXXXXX	18
8	NIRAJ	NOIDA	XXXXXXXXXX	19
9	SOMESH	ROHTAK	XXXXXXXXXX	20

- **Method 2(Inserting specific columns):**

INSERT INTO Student(ROLL_NO,NAME,Age) SELECT ROLL_NO, NAME, Age FROM LateralStudent;

Output:
This query will insert the data in the columns ROLL_NO, NAME and Age of the table LateralStudent in the table Student and the remaining columns in the Student table will be filled by *null* which is the default value of the remaining columns. The table Student will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18

ROLL_NO	NAME	ADDRESS	PHONE	Age
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18
7	SOUVIK	null	null	18
8	NIRAJ	null	null	19
9	SOMESH	null	null	20

- **Select specific rows to insert**:

*INSERT INTO Student SELECT * FROM LateralStudent WHERE Age = 18;*

Output:
This query will select only the first row from table LateralStudent to insert into the table Student. The table Student will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18
7	SOUVIK	DUMDUM	XXXXXXXXXX	18

- ## UPDATE:

The UPDATE statement in SQL is used to update the data of an existing table in database. We can update single columns as well as multiple columns using UPDATE statement as per our requirement.

Basic Syntax:

UPDATE table_name SET column1 = value1, column2 = value2,...

WHERE condition;

table_name: name of the table

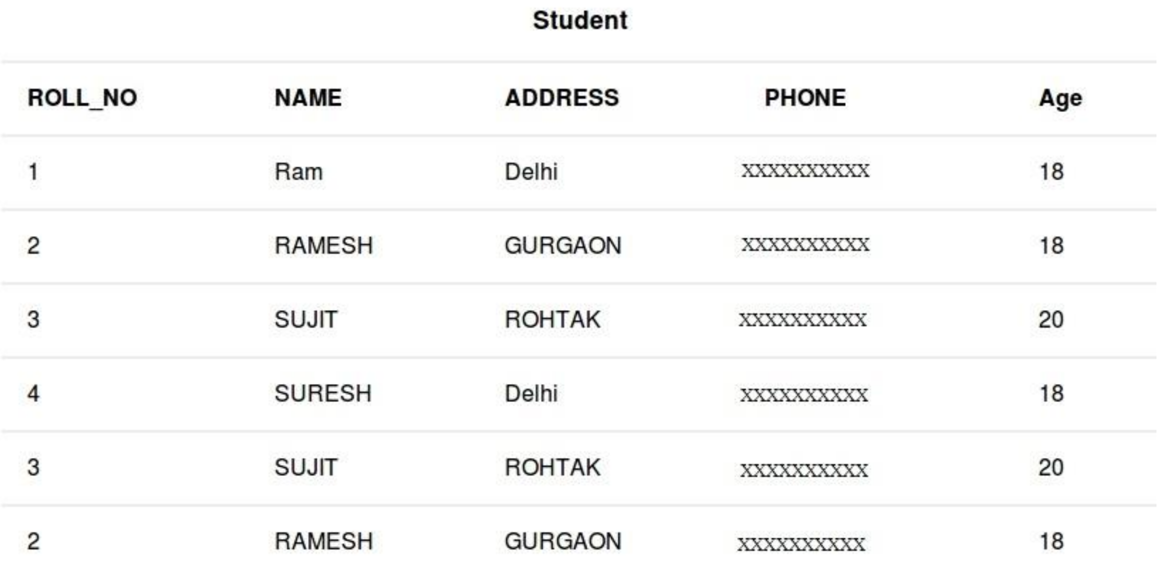
column1: name of first , second, third column....

value1: new value for first, second, third column....

condition: condition to select the rows for which the

values of columns needs to be updated.

NOTE: In the above query the **SET** statement is used to set new values to the particular column and the **WHERE** clause is used to select the rows for which the columns are needed to be updated. If we have not used the WHERE clause then the columns in **all** the rows will be updated. So the WHERE clause is used to choose the particular rows.



Student

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	xxxxxxxxxx	18
2	RAMESH	GURGAON	xxxxxxxxxx	18
3	SUJIT	ROHTAK	xxxxxxxxxx	20
4	SURESH	Delhi	xxxxxxxxxx	18
3	SUJIT	ROHTAK	xxxxxxxxxx	20
2	RAMESH	GURGAON	xxxxxxxxxx	18

Example Queries

- **Updating single column**: Update the column NAME and set the value to ‘PRATIK’ in all the rows where Age is 20.
- UPDATE Student SET NAME = 'PRATIK' WHERE Age = 20;

Output:
This query will update two rows(third row and fifth row) and the table **Student** will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	PRATIK	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18
3	PRATIK	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18

- **Updating multiple columns:** Update the columns NAME to 'PRATIK' and ADDRESS to 'SIKKIM' where ROLL_NO is 1.
- UPDATE Student SET NAME = 'PRATIK', ADDRESS = 'SIKKIM' WHERE ROLL_NO = 1;

Output:
The above query will update two columns in the first row and the table **Student** will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	PRATIK	SIKKIM	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	PRATIK	ROHTAK	XXXXXXXXXX	20

ROLL_NO	NAME	ADDRESS	PHONE	Age
4	SURESH	Delhi	XXXXXXXXXX	18
3	PRATIK	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18

Note: For updating multiple columns we have used comma(,) to separate the names and values of two columns.

- **Omitting WHERE clause:** If we omit the WHERE clause from the update query then all of the rows will get updated.
- UPDATE Student SET NAME = 'PRATIK';

Output:
The table **Student** will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	PRATIK	Delhi	XXXXXXXXXX	18
2	PRATIK	GURGAON	XXXXXXXXXX	18
3	PRATIK	ROHTAK	XXXXXXXXXX	20
4	PRATIK	Delhi	XXXXXXXXXX	18
3	PRATIK	ROHTAK	XXXXXXXXXX	20
2	PRATIK	GURGAON	XXXXXXXXXX	18

- ## DELETE:

The DELETE Statement in SQL is used to delete existing records from a table. We can delete a single record or multiple records depending on the condition we specify in the WHERE clause.

Basic Syntax:

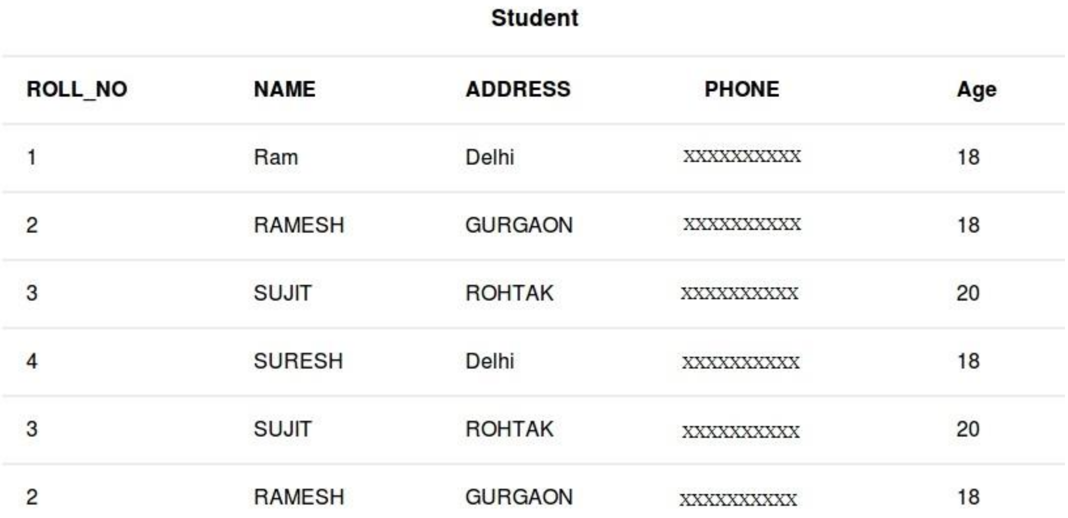
DELETE FROM table_name WHERE some_condition;

table_name: name of the table

some_condition: condition to choose particular record.

Note: We can delete single as well as multiple records depending on the condition we provide in WHERE clause. If we omit the WHERE clause then all of the records will be deleted and the table will be empty.

Sample Table:



Student

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18

Example Queries:

- **Deleting single record**: Delete the rows where NAME = ‘Ram’. This will delete only the first row.
- DELETE FROM Student WHERE NAME = 'Ram';

Output:
The above query will delete only the first row and the table **Student** will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
2	RAMESH	GURGAON	XXXXXXXXXX	18
3	SUJIT	ROHTAK	XXXXXXXXXX	20
4	SURESH	Delhi	XXXXXXXXXX	18

ROLL_NO	NAME	ADDRESS	PHONE	Age
3	SUJIT	ROHTAK	XXXXXXXXXX	20
2	RAMESH	GURGAON	XXXXXXXXXX	18

- **Deleting multiple records**: Delete the rows from the table Student where Age is 20. This will delete 2 rows(third row and fifth row).
- DELETE FROM Student WHERE Age = 20;

Output:
The above query will delete two rows(third row and fifth row) and the table **Student** will now look like,

ROLL_NO	NAME	ADDRESS	PHONE	Age
1	Ram	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18
4	SURESH	Delhi	XXXXXXXXXX	18
2	RAMESH	GURGAON	XXXXXXXXXX	18

- **Delete all of the records:** There are two queries to do this as shown below,
- query1: "DELETE FROM Student";
- query2: "DELETE * FROM Student";

Output:
All of the records in the table will be deleted, there are no records left to display. The table **Student** will become empty!

****