MySQL-SQL

WHAT IS SQL?

1. SQL stands for Structured Query Language.
2. Used for managing and manipulating relational databases.
3. SQL lets you access and manipulate databases.
4. SQL became a standard of the American National Standards Institute (ANSI) in 1986, and of the International Organization for Standardization (ISO) in 1987.

WHAT CAN SQL DO?

1. SQL can execute queries against a database.
2. SQL can retrieve data from a database.
3. SQL can insert records in a database.
4. SQL can update records in a database.
5. SQL can delete records from a database.
6. SQL can create new databases.
7. SQL can create new tables in a database.
8. SQL can create stored procedures in a database.
9. SQL can create views in a database.
10. SQL can set permissions on tables, procedures, and views.

LIST OF WELL KNOWN RELATIONAL DATABASE MANAGEMENT SYSTEMS

1. MySQL
2. PostgreSQL
3. Oracle Database
4. Microsoft SQL Server
5. SQLite
6. IBM Db2
7. MariaDB

CASE SENSITIVE OR NOT?

- KEYWORDS AND IDENTIERS ARE CASE INSENSITIVE LITERALS ARE CASE SENSITIVE.

WHAT DO YOU MEAN BY DBMS? WHAT ARE ITS DIFFERENT TYPES?

Database is a structured collection of data.

A Database Management System (DBMS) is a software application that interacts with the user, applications and the database itself to capture and analyse data.

A DBMS allows a user to interact with the database using query language such as SQL. The data stored in the database can be modified, retrieved and deleted and can be of any type like strings, numbers, images etc.

THERE ARE TWO TYPES OF DBMS:

1. **Relational Database Management System:** The data is stored in relations (tables). Example – MySQL, Oracle SQL.
2. **Non-Relational Database Management System:** There is no concept of relations, tuples and attributes. Example – Mongo

WHAT ARE THE DIFFERENT SUBSETS OF SQL?

The standard SQL commands to interact with relational databases are CREATE, SELECT, INSERT, UPDATE, DELETE and DROP. These commands can be classified into the following groups based on their nature.

1. DDL - Data Definition Language

	Command & Description
1	**CREATE** Creates a new table, a view of a table, or other object in the database.
2	**ALTER** Modifies an existing database object, such as a table.
3	**DROP** Deletes an entire table, a view of a table or other objects in the database.

2. DML - Data Manipulation Language

	Command & Description
1	**SELECT** Retrieves certain records from one or more tables.
2	**INSERT** Creates a record.
3	**UPDATE** Modifies records.
4	**DELETE** Deletes records.

3. DCL - Data Control Language

	Command & Description
1	**GRANT** Gives a privilege to user.
2	**REVOKE** Takes back privileges granted from user.

4. DQL - Data Query Language

	Command & Description
1	**SELECT** The SELECT statement is used to retrieve data from one or more tables.
2	**DISTINCT** The DISTINCT keyword is used with SELECT to retrieve unique values from a specified column or a combination of columns.
3	**FROM** The FROM clause specifies the table or tables from which you want to retrieve data.

4	**WHERE** The WHERE clause is used to filter rows based on a specified condition. It allows you to retrieve only the rows that meet the criteria you specify.
5	**ORDER BY** The ORDER BY clause is used to sort the result set in ascending (ASC) or descending (DESC) order based on one or more columns.
6	**GROUP BY** The GROUP BY clause is used to group rows with the same values in one or more columns into summary rows.
7	**HAVING** The HAVING clause is used to filter the results of a GROUP BY query based on a condition applied to the aggregated values.

WHAT DO YOU MEAN BY TABLE AND FIELD IN SQL?

A table refers to a collection of data in an organised manner in form of rows and columns. A field refers to the number of columns in a table. For example:

Table: StudentInformation

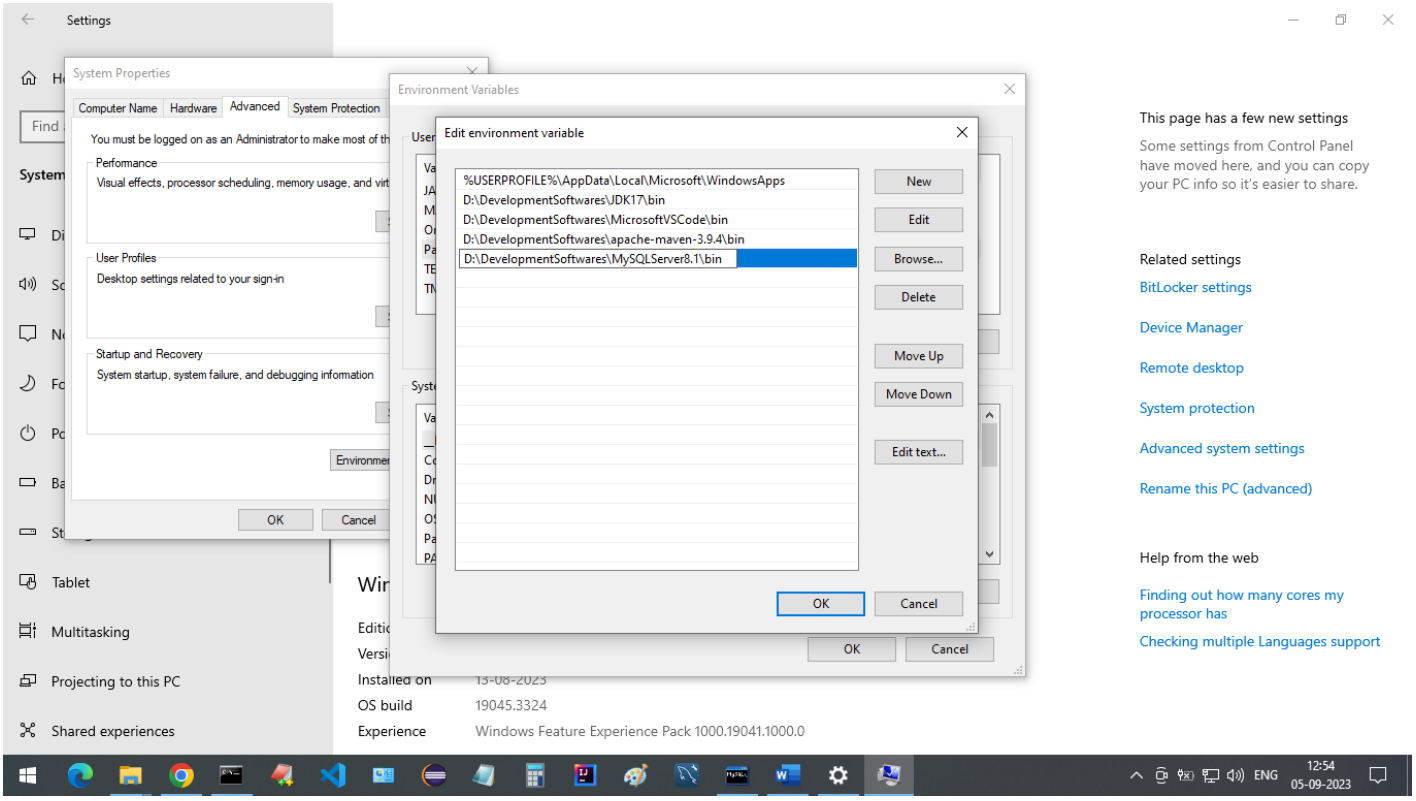
Field: StudentId, StudentName, StudentMarks

Please follow the link to Learn how download and install MySQL Database and MySQL Workbench

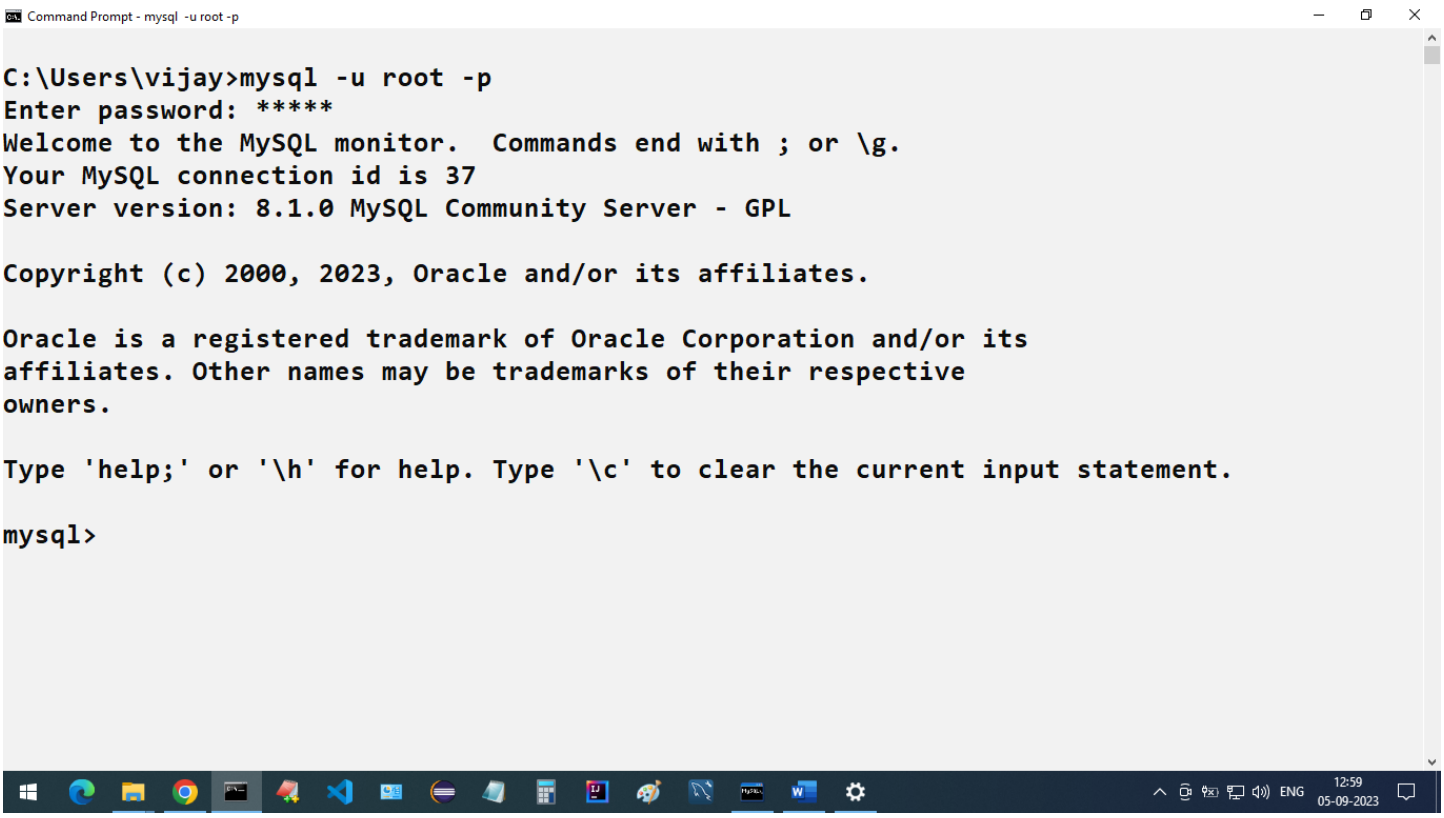
https://rb.gy/3hcwf

Note: If you are getting error while installing MySQL Server and MySQL Workbench like ‘MySql Workbench installer requires Visual C++ 2015’ then follow https://aka.ms/vs/17/release/vc_redist.x64.exe this link and download and install this piece of software.

To Access the SQL Prompt from the windows command Line client set the path

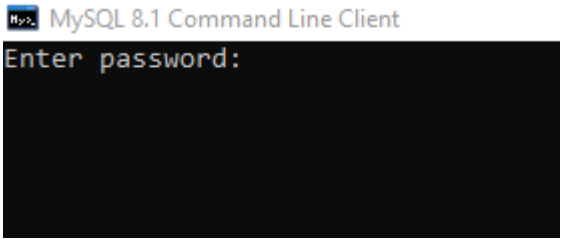


HOW TO LOGIN WITH A PARTICULAR USER FROM THE WINDOWS CMD PROMPT?



HOW TO CHANGE USER IN THE MYSQL COMMAND LINE CLIENT?

Note: By default when you launch, you will be asked to enter the password for the root user.



Later you can chage the user with the following command.

SYSTEM mysql -u vijay -p;

Enter password: ***

Alternatively you can use

\! mysql -u vijay -p

Enter password: ***

Note: In the Windows Command Prompt, you can log in with a specific user at the beginning. However, if you want to change the user, you can use the same command.

```
mysql> SYSTEM mysql -u vijay -p;
Enter password: *****
```

HOW TO CLOSE MYSQL COMMAND LINE CLIENT AS WELL AS TO EXIT FROM THE MYSQL PROMPT FROM WINDOWS COMMAND PROMPT?

EXIT

HOW TO DISPLAY THE CURRENT USER?

You can use the USER() function to retrieve the current user. The USER() function returns the current user name and host name combination that the server used to authenticate the current client.

```
SELECT USER();
+----------------+
| USER()         |
+----------------+
| root@localhost |
+----------------+
1 row in set (0.00 sec)
```

HOW TO DISPLAY ALL THE DATABASES?

SHOW DATABASES command to get list of databases. Run the following query to show list of databases.

```
SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| mysql_notes        |
| performance_schema |
| student_tracker    |
| sys                |
+--------------------+
```

HOW TO CREATE A NEW DATABASE?

```
CREATE DATABASE MYSQL_NOTES;
Query OK, 1 row affected (0.01 sec)

SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| mysql_notes        |
| performance_schema |
| student_tracker    |
| sys                |
+--------------------+
```

HOW TO DELETE A DATABASE?

```
DROP DATABASE MYSQL_NOTES;
Query OK, 0 rows affected (0.01 sec)

SHOW DATABASES;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| student_tracker    |
| sys                |
+--------------------+
```

HOW TO SET OR SELECT A DATABASE?

- Before doing anything first we need to connect to a database.

```
USE MYSQL_NOTES;
Database changed
```

HOW TO CHECK CURRENTLY WHICH DATABASE YOU ARE IN?

```
SELECT DATABASE();
+-------------+
| DATABASE()  |
+-------------+
| mysql_notes |
+-------------+
1 row in set (0.00 sec)
```

HOW TO CREATE A NEW USER?

```
CREATE USER 'new_user'@'localhost' IDENTIFIED BY
'password';
```

new_user is the name we've given to our new user account and the IDENTIFIED BY 'password' section sets a passcode for this user. You can replace these values with your own, inside the quotation marks.

In order to grant all privileges of the database for a newly created user, execute the following command:

```
GRANT ALL PRIVILEGES ON * . * TO 'new_user'@'localhost';
```

For changes to take effect immediately flush these privileges by typing in the command:

```
FLUSH PRIVILEGES;
```

HOW TO DISPLAY ALL THE USERS FROM A DATABASE?

```
SELECT user, host FROM mysql.user;
```

In the above query mysql is the database.

IS IT MANDATORY TO KEEP SEMICOLON AFTER SQL STATEMENTS?

1. Some database systems require a semicolon at the end of each SQL statement.
2. Semicolon is the standard way to separate each SQL statement in database systems that allow more than one SQL statement to be executed in the same call to the server.

HOW TO CREATE A NEW USER WITH PASSWORD?

```
CREATE USER 'manager'@'localhost' IDENTIFIED BY 'admin';
CREATE USER 'vijay'@'localhost' IDENTIFIED BY 'admin';
```

HOW TO DROP EXISTING USER?

```
DROP USER 'manager'@'localhost';
DROP USER 'vijay'@'localhost';
```

HOW TO GRANT ALL PRIVILIAGES TO THE USER?

```
GRANT ALL PRIVILEGES ON *.* TO 'vijay'@'localhost';
```

HOW TO CHECK CURRENT USER PRIVILIAGES?

```
SHOW GRANTS FOR 'root'@'localhost';
```

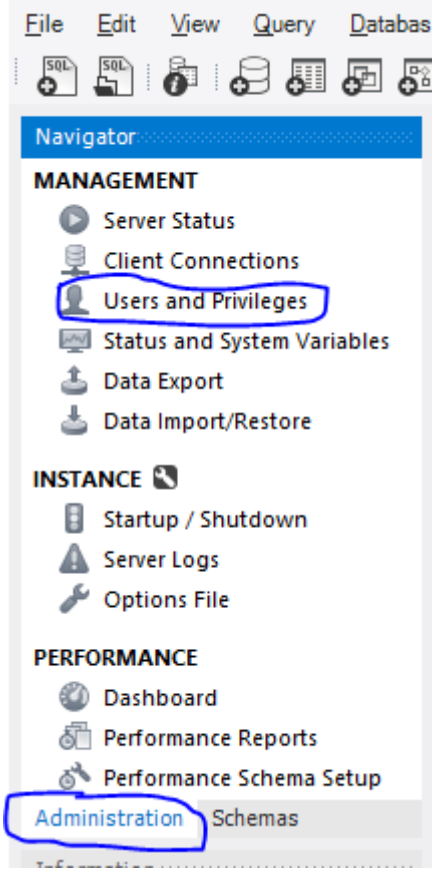
HOW TO FOR CHANGES TO TAKE EFFECT IMMEDIATELY?

```
FLUSH PRIVILEGES;
```

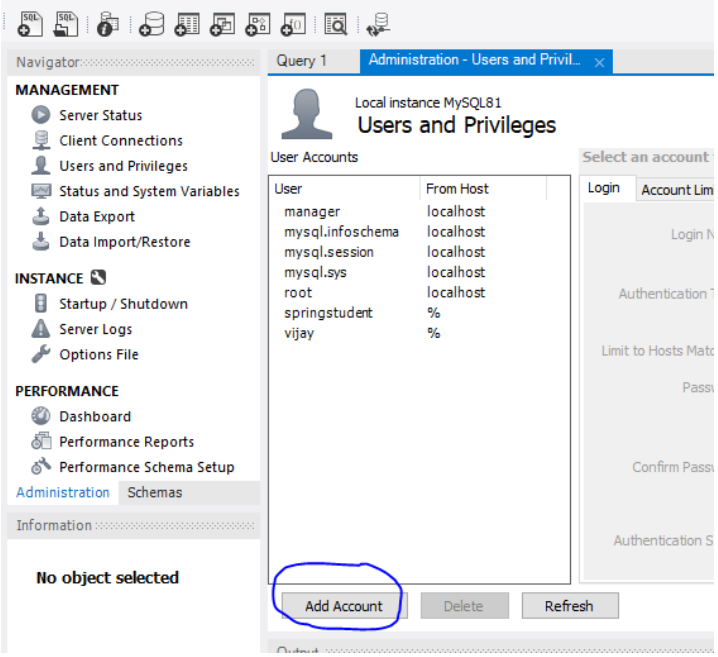
Note: Starting from MySQL 5.7.3, the FLUSH PRIVILEGES; statement is no longer strictly required after executing GRANT or REVOKE statements. The server automatically reloads the grant tables in these cases.

HOW TO CREATE A NEW USER IN THE MYSQL WORKBENCH?

1. Log in to any connection
2. Click on Administration on the left hand side

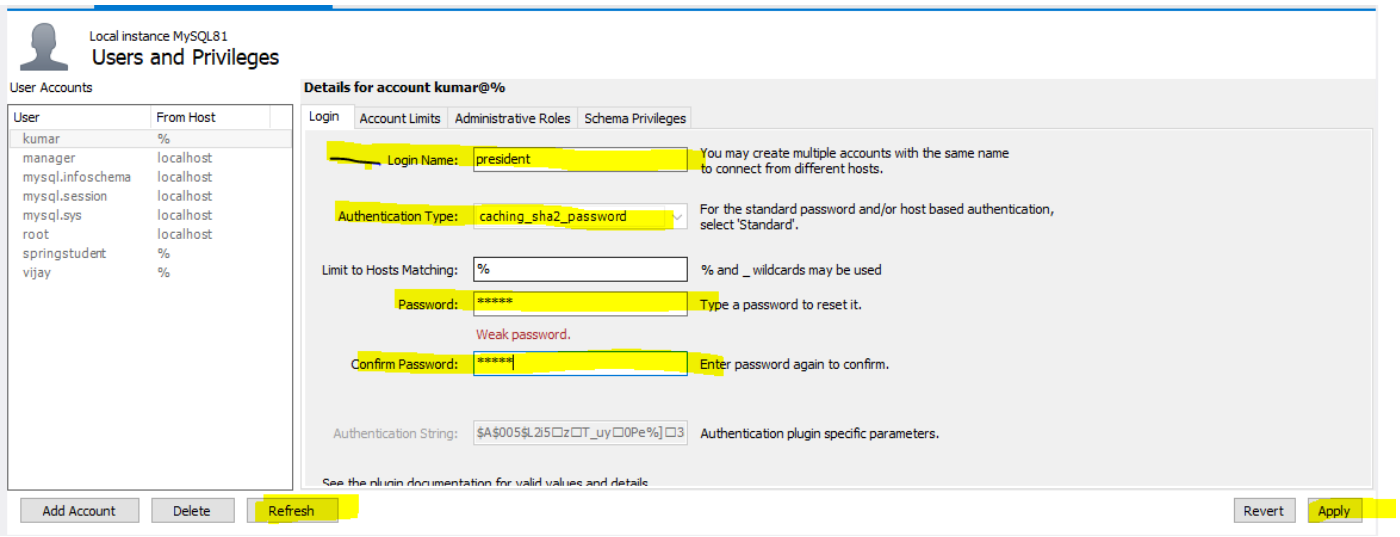


3. Click on Users and Privileges
4. Click on Add account to create a new account



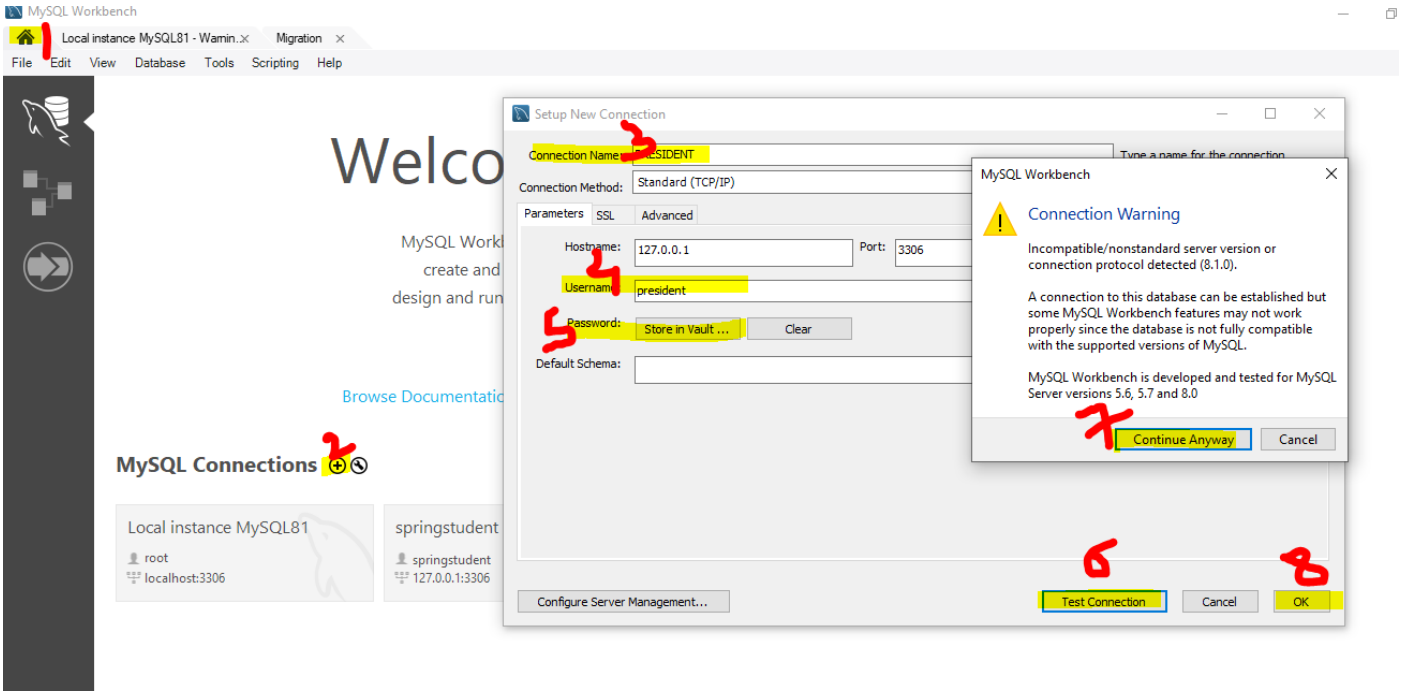
5. Fill in the deatails

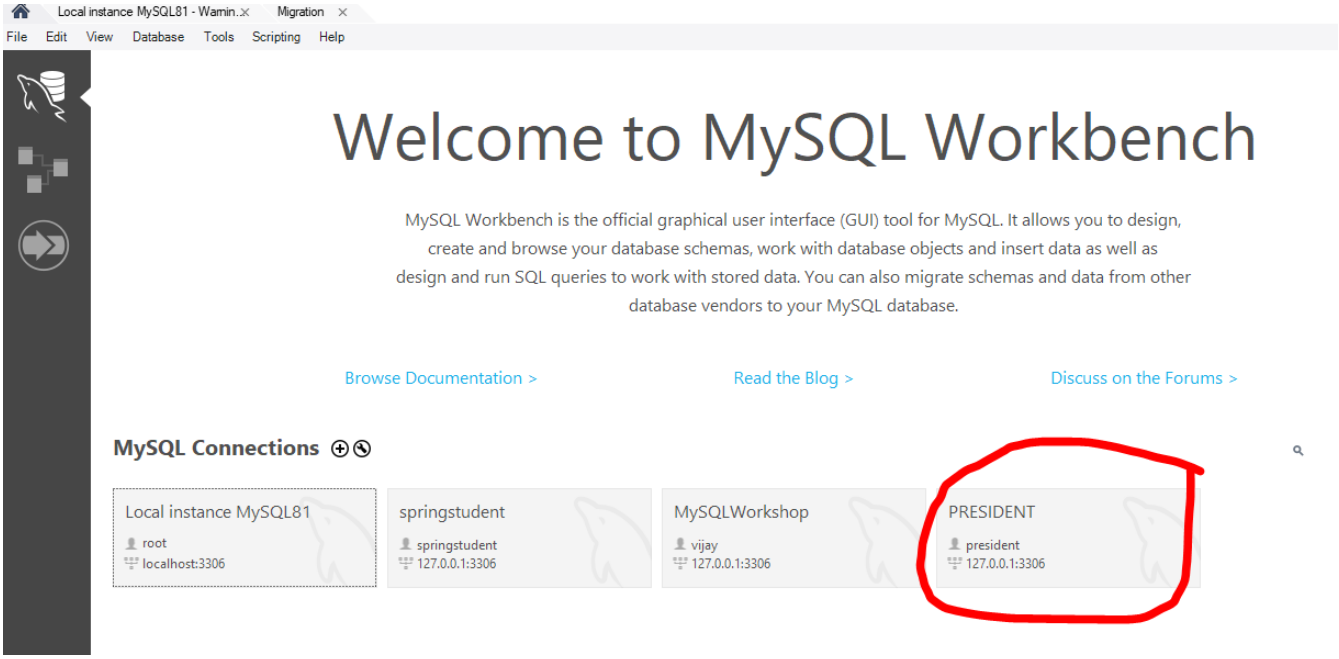
Note: Authentication type should be same as other accounts(check for root)



6.Click on Apply and Refresh

HOW TO ADD A NEW CONNECTION TO THE MYSQL WORKBENCH HOME?





Note: While creating the connection the user must be available(created already). Password is the user password that you have given at the time of creating a user.

HOW TO CLEAR THE SCREEN IN MYSQL?

```
\! cls
```

HOW TO CREATE A SIMPLE TABLE?

```
CREATE TABLE STUDENT (ID INTEGER, FIRST_NAME VARCHAR(90),
AGE INTEGER, COURSE VARCHAR(10));
```

```
Query OK, 0 rows affected (0.03 sec)
```

- INTEGER is a data type synonym for INT.
- You can use both INT and INTEGER datatype to specify number types.

HOW TO INSERT RECORDS TO THE TABLE?

```
INSERT INTO STUDENT VALUES (101, 'ARUN', 20, 'CSE');
INSERT INTO STUDENT VALUES (102, 'BHAVESH', 21, 'ISE');
INSERT INTO STUDENT VALUES (103, 'CHAITANYA', 22, 'ECE');
INSERT INTO STUDENT VALUES (104, 'DEEPIKA', 23, 'MECH');
```

```
INSERT INTO STUDENT VALUES (105, 'DHANUSH', 24, 'DS');
INSERT INTO STUDENT VALUES (106, 'EKTA', 25, 'AI');
INSERT INTO STUDENT VALUES (107, 'GAURAV', 26, 'ARCH');
INSERT INTO STUDENT VALUES (108, 'HARSHITA', 27,
'CHEMICAL');
INSERT INTO STUDENT VALUES (109, 'ISHAAN', 28, 'CIVIL');
INSERT INTO STUDENT VALUES (110, 'JANU', 29, 'EEE');
```

HOW TO DISPLAY ALL THE RECORDS WITH ALL THE COLUMNS?

```
SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
|  107 | GAURAV     |   26 | ARCH     |
|  108 | HARSHITA   |   27 | CHEMICAL |
|  109 | ISHAAN     |   28 | CIVIL    |
|  110 | JANU       |   29 | EEE      |
+------+------------+------+----------+
10 rows in set (0.00 sec)
```

CAN WE INSERT NULL VALUES TO THE COLUMNS?

- By default, columns will be allowing **duplicate** values.

```
INSERT INTO STUDENT VALUES (110, 'JANU', 29, 'EEE');
Query OK, 1 row affected (0.00 sec)

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
|  107 | GAURAV     |   26 | ARCH     |
|  108 | HARSHITA   |   27 | CHEMICAL |
|  109 | ISHAAN     |   28 | CIVIL    |
|  110 | JANU       |   29 | EEE      |
|  110 | JANU       |   29 | EEE      |
+------+------------+------+----------+
11 rows in set (0.00 sec)
```

- By default, columns will be allowing ‘null’ values.
- In MySQL, NULL represents an unknown or missing value in a database table.

```
INSERT INTO STUDENT(ID, FIRST_NAME) VALUES(111, 'PRANAV');
Query OK, 1 row affected (0.01 sec)

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
|  107 | GAURAV     |   26 | ARCH     |
|  108 | HARSHITA   |   27 | CHEMICAL |
|  109 | ISHAAN     |   28 | CIVIL    |
|  110 | JANU       |   29 | EEE      |
|  110 | JANU       |   29 | EEE      |
|  111 | PRANAV     | NULL | NULL     |
+------+------------+------+----------+
12 rows in set (0.00 sec)
```

HOW TO UPDATE SINGLE COLUMN IN THE RECORD?

```
UPDATE STUDENT SET FIRST_NAME = 'RISHI' WHERE ID = 108;
Query OK, 1 row affected (0.01 sec)
```

```
Rows matched: 1  Changed: 1  Warnings: 0


SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
|  107 | GAURAV     |   26 | ARCH     |
|  108 | RISHI      |   27 | CHEMICAL |
|  109 | ISHAAN     |   28 | CIVIL    |
|  110 | JANU       |   29 | EEE      |
|  110 | JANU       |   29 | EEE      |
|  111 | PRANAV     | NULL | NULL     |
+------+------------+------+----------+
12 rows in set (0.00 sec)
```

HOW TO UPDATE MULTIPLE COLUMNS IN THE RECORD?

```
UPDATE STUDENT SET ID = 112, FIRST_NAME = 'RAJAT', AGE =
29, COURSE = 'AUTOMOBILE' WHERE ID = 105;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

```
SELECT * FROM STUDENT;
+------+------------+------+------------+
| ID   | FIRST_NAME | AGE  | COURSE     |
+------+------------+------+------------+
|  101 | ARUN       |   20 | CSE        |
|  102 | BHAVESH    |   21 | ISE        |
|  103 | CHAITANYA  |   22 | ECE        |
|  104 | DEEPIKA    |   23 | MECH       |
|  112 | RAJAT      |   29 | AUTOMOBILE |
|  106 | EKTA       |   25 | AI         |
|  107 | GAURAV     |   26 | ARCH       |
|  108 | RISHI      |   27 | CHEMICAL   |
|  109 | ISHAAN     |   28 | CIVIL      |
|  110 | JANU       |   29 | EEE        |
|  110 | JANU       |   29 | EEE        |
|  111 | PRANAV     | NULL | NULL       |
+------+------------+------+------------+
12 rows in set (0.00 sec)
```

WHAT IS `NULL` IN SQL?

NULL is a special marker in SQL that represents the absence of a value or a undefined value in a database.

Note: `NULL` is case insensitive

HOW TO USE `IS NULL`?

IS NULL is a condition used to check if a particular column in a database table has a NULL value.

```
UPDATE STUDENT SET AGE = 30 WHERE AGE IS NULL;

Query OK, 1 row affected (0.01 sec)

Rows matched: 1  Changed: 1  Warnings: 0


SELECT * FROM STUDENT;

+------+------------+------+------------+
| ID   | FIRST_NAME | AGE  | COURSE     |
+------+------------+------+------------+
|  101 | ARUN       |   20 | CSE        |
|  102 | BHAVESH    |   21 | ISE        |
|  103 | CHAITANYA  |   22 | ECE        |
|  104 | DEEPIKA    |   23 | MECH       |
|  112 | RAJAT      |   29 | AUTOMOBILE |
|  106 | EKTA       |   25 | AI         |
|  107 | GAURAV     |   26 | ARCH       |
|  108 | RISHI      |   27 | CHEMICAL   |
|  109 | ISHAAN     |   28 | CIVIL      |
|  110 | JANU       |   29 | EEE        |
|  110 | JANU       |   29 | EEE        |
|  111 | PRANAV     |   30 | NULL       |
+------+------------+------+------------+
12 rows in set (0.00 sec)
```

HOW TO USE `IS NOT NULL`?

The IS NOT NULL condition is used to filter rows where a particular column does not contain a NULL value. It is the opposite of the IS NULL condition.

```
UPDATE STUDENT SET AGE = 20 WHERE FIRST_NAME IS NOT NULL;
Query OK, 11 rows affected (0.01 sec)
Rows matched: 12  Changed: 11  Warnings: 0

SELECT * FROM STUDENT;
+------+------------+------+------------+
| ID   | FIRST_NAME | AGE  | COURSE     |
+------+------------+------+------------+
|  101 | ARUN       |   20 | CSE        |
|  102 | BHAVESH    |   20 | ISE        |
|  103 | CHAITANYA  |   20 | ECE        |
|  104 | DEEPIKA    |   20 | MECH       |
|  112 | RAJAT      |   20 | AUTOMOBILE |
|  106 | EKTA       |   20 | AI         |
|  107 | GAURAV     |   20 | ARCH       |
|  108 | RISHI      |   20 | CHEMICAL   |
|  109 | ISHAAN     |   20 | CIVIL      |
|  110 | JANU       |   20 | EEE        |
|  110 | JANU       |   20 | EEE        |
|  111 | PRANAV     |   20 | NULL       |
+------+------------+------+------------+
12 rows in set (0.00 sec)
```

HOW TO DELETE ALL THE RECORDS FROM A TABLE?

```
DELETE FROM STUDENT;
Query OK, 12 rows affected (0.01 sec)
```

HOW TO INSERT RECORDS USING A SINGLE STATMENT?

```
INSERT INTO STUDENT VALUES
  (101, 'ARUN', 20, 'CSE'),
  (102, 'BHAVESH', 21, 'ISE'),
  (103, 'CHAITANYA', 22, 'ECE'),
  (104, 'DEEPIKA', 23, 'MECH'),
  (105, 'DHANUSH', 24, 'DS'),
  (106, 'EKTA', 25, 'AI'),
  (107, 'GAURAV', 26, 'ARCH'),
  (108, 'HARSHITA', 27, 'CHEMICAL'),
  (109, 'ISHAAN', 28, 'CIVIL'),
  (110, 'JANU', 29, 'EEE');

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
```

```
|   107 | GAURAV      |    26 | ARCH      |
|   108 | HARSHITA    |    27 | CHEMICAL  |
|   109 | ISHAAN      |    28 | CIVIL     |
|   110 | JANU        |    29 | EEE       |
+------+------------+------+----------+
10 rows in set (0.00 sec)
```

HOW WOULD YOU UPDATE THE FIRST NAME COLUMN IN THE STUDENT TABLE FOR ALL RECORDS WHERE THE ID IS GREATER THAN 104, SETTING THE FIRST_NAME TO 'ANANYA'?

```
UPDATE STUDENT SET FIRST_NAME = 'ANANYA' WHERE ID > 104;
Query OK, 6 rows affected (0.01 sec)
Rows matched: 6  Changed: 6  Warnings: 0

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|   101 | ARUN        |    20 | CSE       |
|   102 | BHAVESH     |    21 | ISE       |
|   103 | CHAITANYA   |    22 | ECE       |
|   104 | DEEPIKA     |    23 | MECH      |
|   105 | ANANYA      |    24 | DS        |
|   106 | ANANYA      |    25 | AI        |
|   107 | ANANYA      |    26 | ARCH      |
|   108 | ANANYA      |    27 | CHEMICAL  |
```

```
|   109 | ANANYA      |    28 | CIVIL     |
|   110 | ANANYA      |    29 | EEE       |
+------+------------+------+----------+
10 rows in set (0.00 sec)
```

HOW WOULD YOU UPDATE MULTILE COLUMNS?

```
UPDATE STUDENT SET AGE = 22, ID = 10 WHERE ID <= 107;
Query OK, 7 rows affected (0.00 sec)
Rows matched: 7  Changed: 7  Warnings: 0

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|    10 | ARUN       |    22 | CSE      |
|    10 | BHAVESH    |    22 | ISE      |
|    10 | CHAITANYA  |    22 | ECE      |
|    10 | DEEPIKA    |    22 | MECH     |
|    10 | ANANYA     |    22 | DS       |
|    10 | ANANYA     |    22 | AI       |
|    10 | ANANYA     |    22 | ARCH     |
|   108 | ANANYA     |    27 | CHEMICAL |
|   109 | ANANYA     |    28 | CIVIL    |
|   110 | ANANYA     |    29 | EEE      |
+------+------------+------+----------+
10 rows in set (0.00 sec)
```

HOW WOULD YOU UPDATE ALL THE COLUMNS?

```
UPDATE STUDENT SET AGE = 42, ID = 15;
Query OK, 10 rows affected (0.00 sec)
Rows matched: 10  Changed: 10  Warnings: 0

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|   15 | ARUN       |   42 | CSE      |
|   15 | BHAVESH    |   42 | ISE      |
|   15 | CHAITANYA  |   42 | ECE      |
|   15 | DEEPIKA    |   42 | MECH     |
|   15 | ANANYA     |   42 | DS       |
|   15 | ANANYA     |   42 | AI       |
|   15 | ANANYA     |   42 | ARCH     |
|   15 | ANANYA     |   42 | CHEMICAL |
|   15 | ANANYA     |   42 | CIVIL    |
|   15 | ANANYA     |   42 | EEE      |
+------+------------+------+----------+
10 rows in set (0.00 sec)

DELETE FROM STUDENT;
Query OK, 10 rows affected (0.01 sec)
```

HOW WOULD YOU EXECUTE MULTIPLE STATMENTS IN THE SQL WORKBENCH?

1.Write Your SQL Statements:

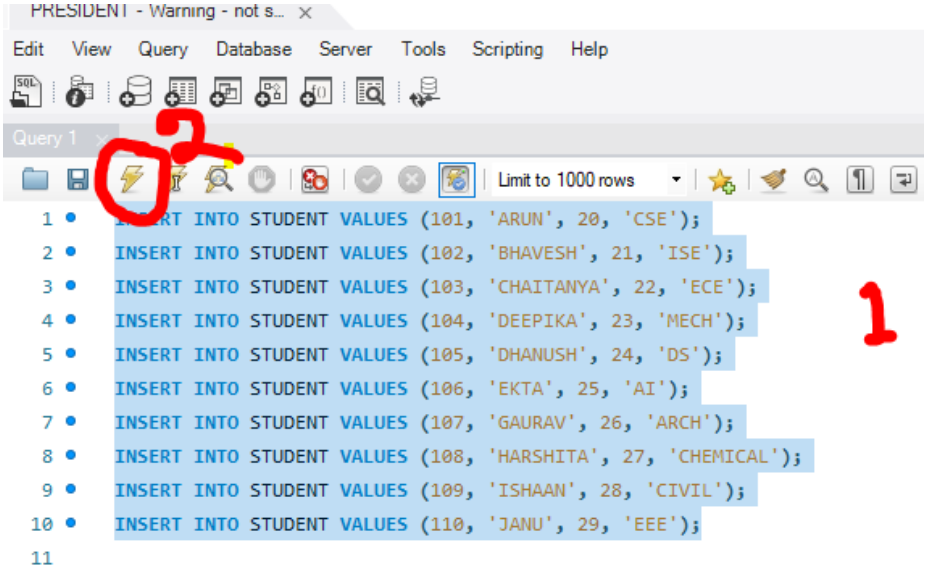
Open SQL Workbench and write the SQL statements you want to execute. Separate each statement with a semicolon (;).

2.Highlight the Statements:

Highlight all the SQL statements you want to execute.

3.Execute the Statements:

Execute the highlighted statements by either clicking on the "Execute" button(flash symbol), or pressing the appropriate shortcut (e.g., F5), or selecting the "Execute SQL" option from the menu.




```
INSERT INTO STUDENT VALUES (101, 'ARUN', 20, 'CSE');
INSERT INTO STUDENT VALUES (102, 'BHAVESH', 21, 'ISE');
INSERT INTO STUDENT VALUES (103, 'CHAITANYA', 22, 'ECE');
INSERT INTO STUDENT VALUES (104, 'DEEPIKA', 23, 'MECH');
INSERT INTO STUDENT VALUES (105, 'DHANUSH', 24, 'DS');
INSERT INTO STUDENT VALUES (106, 'EKTA', 25, 'AI');
INSERT INTO STUDENT VALUES (107, 'GAURAV', 26, 'ARCH');
INSERT INTO STUDENT VALUES (108, 'HARSHITA', 27,
'CHEMICAL');
```

```
INSERT INTO STUDENT VALUES (109, 'ISHAAN', 28, 'CIVIL');
INSERT INTO STUDENT VALUES (110, 'JANU', 29, 'EEE');

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
|  107 | GAURAV     |   26 | ARCH     |
|  108 | HARSHITA   |   27 | CHEMICAL |
|  109 | ISHAAN     |   28 | CIVIL    |
|  110 | JANU       |   29 | EEE      |
+------+------------+------+----------+
10 rows in set (0.00 sec)
```

HOW WOULD YOU HOW YOU WOULD USE AN SQL DELETE STATEMENT TO REMOVE A SPECIFIC STUDENT RECORD WITH THE ID OF 6 FROM THE STUDENT TABLE?

```
DELETE FROM STUDENT WHERE ID = 6;
Query OK, 0 rows affected (0.00 sec)

DELETE FROM STUDENT WHERE FIRST_NAME = 'ISHAAN';
```

```
Query OK, 1 row affected (0.00 sec)

SELECT * FROM STUDENT;
+------+------------+------+----------+
| ID   | FIRST_NAME | AGE  | COURSE   |
+------+------------+------+----------+
|  101 | ARUN       |   20 | CSE      |
|  102 | BHAVESH    |   21 | ISE      |
|  103 | CHAITANYA  |   22 | ECE      |
|  104 | DEEPIKA    |   23 | MECH     |
|  105 | DHANUSH    |   24 | DS       |
|  106 | EKTA       |   25 | AI       |
|  107 | GAURAV     |   26 | ARCH     |
|  108 | HARSHITA   |   27 | CHEMICAL |
|  110 | JANU       |   29 | EEE      |
+------+------------+------+----------+
9 rows in set (0.00 sec)

DELETE FROM STUDENT;
Query OK, 9 rows affected (0.01 sec)

SELECT * FROM STUDENT;
Empty set (0.00 sec)
```

HOW WOULD YOU REMOVE A TABLE FROM THE DATABASE?

```
DROP TABLE STUDENT;
Query OK, 0 rows affected (0.02 sec)
```

```
CREATE TABLE EMPLOYEE (ID INTEGER, FIRST_NAME VARCHAR(90),
LAST_NAME VARCHAR(90), AGE INTEGER, SALARY INTEGER, EMAIL
VARCHAR(90));
```

```
Query OK, 0 rows affected (0.03 sec)
```

```
INSERT INTO EMPLOYEE VALUES(1, 'ARUN', 'PATEL', 22, 40000,
'ARUN@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(2, 'BHAVESH', 'SHARMA', 24,
30000, 'BHAVESH@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(3, 'CHAITANYA', 'SINGH', 23,
50000, 'CHAITANYA@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(4, 'DEEPIKA', 'GUPTA', 26,
55000, 'DEEPIKA@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(5, 'DHANUSH', 'KUMAR', 25,
20000, 'DHANUSH@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(6, 'EKTA', 'YADAV', 28, 35000,
'YADAV@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(7, 'GAURAV', 'RAO', 21, 60000,
'GAURAV@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(8, 'HARSHITA', 'REDDY', 29,
56000, 'HARSHITA@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(9, 'ISHAAN', 'REDDY', 32,
70000, 'ISHAAN@GCOMPANY.IN');
INSERT INTO EMPLOYEE VALUES(10, 'JANU', 'MUKHERJEE', 30,
53000, 'JANU@GCOMPANY.IN');
```

```
SELECT * FROM EMPLOYEE;
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL     |   22 |  40000 | ARUN@GCOMPANY.IN     |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN   |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
10 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WITH THE ID OF 5 FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE ID = 5;
+------+------------+-----------+------+--------+--------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL              |
+------+------------+-----------+------+--------+--------------------+
|    5 |  DHANUSH   |  KUMAR    |   25 |  20000 | DHANUSH@GCOMPANY.IN |
+------+------------+-----------+------+--------+--------------------+
1 row in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WITH THE ID GREATER THAN 5 FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE ID > 5;
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN   |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
5 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WHERE AGE RANGE OF 22 TO 28 FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE AGE BETWEEN 22 AND 28;
+------+------------+-----------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL                |
+------+------------+-----------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL    |   22 |  40000 |  ARUN@GCOMPANY.IN    |
|    2 |  BHAVESH   |  SHARMA   |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH    |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA    |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR    |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV    |   28 |  35000 | YADAV@GCOMPANY.IN    |
+------+------------+-----------+------+--------+----------------------+
6 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WHERE AGE NOT IN THE RANGE OF 22 TO 28 FROM THE EMPLOYEE TABLE?

SELECT * FROM EMPLOYEE WHERE AGE NOT BETWEEN 22 AND 28;

```
+------+------------+------------+------+--------+---------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL               |
+------+------------+------------+------+--------+---------------------+
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN  |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN  |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN    |
+------+------------+------------+------+--------+---------------------+
4 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE RETRIEVE DETAILS FOR EMPLOYEES WHOSE SALARIES MATCH SPECIFIC VALUES FROM THE EMPLOYEE TABLE?

SELECT * FROM EMPLOYEE WHERE SALARY IN (40000, 55000, 70000);

```
+------+------------+-----------+------+--------+--------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL              |
+------+------------+-----------+------+--------+--------------------+
|    1 |  ARUN      |  PATEL    |   22 |  40000 |  ARUN@GCOMPANY.IN  |
|    4 |  DEEPIKA   |  GUPTA    |   26 |  55000 | DEEPIKA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY    |   32 |  70000 | ISHAAN@GCOMPANY.IN |
+------+------------+-----------+------+--------+--------------------+
3 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE RETRIEVE DETAILS FOR EMPLOYEES WHOSE SALARIES DOESNT MATCH SPECIFIC VALUES FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE SALARY NOT IN (40000, 55000, 70000);
```

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
7 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WHERE NAMES OF ALL EMPLOYEES WHOSE FIRST NAME INCLUDES THE LETTER "R" FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE FIRST_NAME LIKE '%R%';
```

```
+------+------------+-----------+------+--------+---------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL               |
+------+------------+-----------+------+--------+---------------------+
|    1 |  ARUN      |  PATEL    |   22 |  40000 |  ARUN@GCOMPANY.IN   |
|    7 |  GAURAV    |  RAO      |   21 |  60000 | GAURAV@GCOMPANY.IN  |
|    8 |  HARSHITA  |  REDDY    |   29 |  56000 | HARSHITA@GCOMPANY.IN |
+------+------------+-----------+------+--------+---------------------+
3 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WHERE NAMES OF ALL EMPLOYEES WHOSE FIRST NAME ENDING WITH THE LETTER "R" FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE FIRST_NAME LIKE '%A';
+------+------------+-----------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL                |
+------+------------+-----------+------+--------+----------------------+
|    3 |  CHAITANYA |  SINGH    |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA    |   26 |  55000 | DEEPIKA@GCOMPANY.IN   |
|    6 |  EKTA      |  YADAV    |   28 |  35000 | YADAV@GCOMPANY.IN     |
|    8 |  HARSHITA  |  REDDY    |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
+------+------------+-----------+------+--------+----------------------+
4 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS OF THE EMPLOYEE TABLE WHERE NAMES OF ALL EMPLOYEES WHOSE FIRST NAME STARTING WITH THE LETTER "R" FROM THE EMPLOYEE TABLE?

```
SELECT * FROM EMPLOYEE WHERE FIRST_NAME LIKE 'A%';
+------+------------+-----------+------+--------+-----------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL           |
+------+------------+-----------+------+--------+-----------------+
|    1 | ARUN       | PATEL     |   22 |  40000 | ARUN@GCOMPANY.IN |
+------+------------+-----------+------+--------+-----------------+
1 row in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS WHERE FIRST NAMES AND AGES OF ALL EMPLOYEES FROM THE EMPLOYEE TABLE?

```
SELECT FIRST_NAME, AGE FROM EMPLOYEE;
+------------+------+
| FIRST_NAME | AGE  |
+------------+------+
|  ARUN      |   22 |
|  BHAVESH   |   24 |
|  CHAITANYA |   23 |
|  DEEPIKA   |   26 |
|  DHANUSH   |   25 |
|  EKTA      |   28 |
|  GAURAV    |   21 |
|  HARSHITA  |   29 |
|  ISHAAN    |   32 |
|  JANU      |   30 |
+------------+------+
10 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS WHERE FIRST NAMES, AGE AND EMAIL OF ALL EMPLOYEES FROM THE EMPLOYEE TABLE?

```
SELECT FIRST_NAME, AGE, EMAIL FROM EMPLOYEE;
+------------+------+----------------------+
| FIRST_NAME | AGE  | EMAIL                |
+------------+------+----------------------+
|  ARUN      |   22 |  ARUN@GCOMPANY.IN    |
|  BHAVESH   |   24 | BHAVESH@GCOMPANY.IN  |
|  CHAITANYA |   23 | CHAITANYA@GCOMPANY.IN |
|  DEEPIKA   |   26 | DEEPIKA@GCOMPANY.IN  |
|  DHANUSH   |   25 | DHANUSH@GCOMPANY.IN  |
|  EKTA      |   28 | YADAV@GCOMPANY.IN    |
|  GAURAV    |   21 | GAURAV@GCOMPANY.IN   |
|  HARSHITA  |   29 | HARSHITA@GCOMPANY.IN |
|  ISHAAN    |   32 | ISHAAN@GCOMPANY.IN   |
|  JANU      |   30 | JANU@GCOMPANY.IN     |
+------------+------+----------------------+
10 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS USING ALIAS NAMES FOR THE COLUMNS USING `AS` KEYWORD FROM THE EMPLOYEE TABLE?

```
SELECT FIRST_NAME AS NAME, AGE AS EMPLOYEE_AGE, LAST_NAME
FROM EMPLOYEE;

+------------+--------------+------------+
| NAME       | EMPLOYEE_AGE | LAST_NAME  |
+------------+--------------+------------+
|  ARUN      |           22 |  PATEL     |
|  BHAVESH   |           24 |  SHARMA    |
|  CHAITANYA |           23 |  SINGH     |
|  DEEPIKA   |           26 |  GUPTA     |
|  DHANUSH   |           25 |  KUMAR     |
|  EKTA      |           28 |  YADAV     |
|  GAURAV    |           21 |  RAO       |
|  HARSHITA  |           29 |  REDDY     |
|  ISHAAN    |           32 |  REDDY     |
|  JANU      |           30 |  MUKHERJEE |
+------------+--------------+------------+
10 rows in set (0.00 sec)
```

WRITE AN SQL QUERY THAT RETRIEVES RECORDS USING ALIAS NAMES FOR THE COLUMNS WITHOUT USING `AS` KEYWORD FROM THE EMPLOYEE TABLE?

```
SELECT FIRST_NAME NAME, AGE EMPLOYEE_AGE, LAST_NAME FROM
EMPLOYEE;
```

NAME	EMPLOYEE_AGE	LAST_NAME
ARUN	22	PATEL
BHAVESH	24	SHARMA
CHAITANYA	23	SINGH
DEEPIKA	26	GUPTA
DHANUSH	25	KUMAR
EKTA	28	YADAV
GAURAV	21	RAO
HARSHITA	29	REDDY
ISHAAN	32	REDDY
JANU	30	MUKHERJEE

10 rows in set (0.00 sec)

WRITE AN SQL QUERY THAT RETRIEVES THE TOTAL NUMBER OF EMPLOYEES IN THE COMPANY?

The COUNT(*) function in SQL is used to count the number of rows in a table or the result set of a query. It can be used in various ways to analyze and retrieve information from your data.

Here's a breakdown of what COUNT(*) does:

Counts all rows: The asterisk (*) indicates that all columns in every row should be counted, regardless of their value (including null values).

Returns an integer: The function returns a single integer value representing the total number of rows counted.

Used in SELECT statements: COUNT(*) is typically used within a SELECT statement, often in conjunction with other functions like WHERE clauses to filter the data before counting.

EXAMPLE: 1

```
SELECT COUNT(*) FROM EMPLOYEE;
+----------+
| COUNT(*) |
+----------+
|       10 |
+----------+
1 row in set (0.01 sec)
```

EXAMPLE: 2

```
SELECT COUNT(*) AS "RECORDS COUNT" FROM EMPLOYEE;
+---------------+
| RECORDS COUNT |
+---------------+
|            10 |
+---------------+
1 row in set (0.00 sec)
```

EXAMPLE: 3

```
SELECT COUNT(*) "RECORDS COUNT" FROM EMPLOYEE;
+---------------+
| RECORDS COUNT |
+---------------+
|            10 |
+---------------+
1 row in set (0.00 sec)
```

RETRIEVE THE COUNT OF EMPLOYEE RECORDS WHOSE AGE COLUMN HAVING A VALUE EXCEPT `NULL`?

```
SELECT COUNT(AGE) "AGE COLUMN COUNT" FROM EMPLOYEE;
+---------------+
| AGE COLUMN COUNT |
+---------------+
|            10 |
+---------------+
1 row in set (0.00 sec)
```

RETRIEVE THE COUNT OF EMPLOYEE RECORDS WHOSE LAST NAME COLUMN HAVING A VALUE EXCEPT `NULL`?

```
SELECT COUNT(LAST_NAME)  "RECORDS COUNT" FROM EMPLOYEE;
+---------------+
| RECORDS COUNT |
+---------------+
|            10 |
+---------------+
```

```
1 row in set (0.01 sec)
```

RETRIEVE MAXIMUM AGE FROM THE EMPLOYEE TABLE?

EXAMPLE: 1

```
SELECT MAX(AGE) FROM EMPLOYEE;
+----------+
| MAX(AGE) |
+----------+
|       32 |
+----------+
1 row in set (0.00 sec)
```

EXAMPLE: 2

```
SELECT MAX(AGE) AS "MAX AGE" FROM EMPLOYEE;
+---------+
| MAX AGE |
+---------+
|      32 |
+---------+
1 row in set (0.00 sec)
```

RETRIEVE MINIMUM SALARY FROM THE EMPLOYEE TABLE?

EXAMPLE: 1

```
SELECT MIN(SALARY) FROM EMPLOYEE;
+-------------+
| MIN(SALARY) |
+-------------+
|       20000 |
```

```
+-------------+
1 row in set (0.00 sec)
```

EXAMPLE: 2

```
SELECT MIN(SALARY) MIN_SAL FROM EMPLOYEE;
+---------+
| MIN_SAL |
+---------+
|   20000 |
+---------+
1 row in set (0.00 sec)
```

EXAMPLE: 3

```
SELECT MIN(SALARY) "MIN SAL" FROM EMPLOYEE;
+---------+
| MIN SAL |
+---------+
|   20000 |
+---------+
1 row in set (0.00 sec)
```

RETRIEVE AVERAGE SALARY FROM THE EMPLOYEE TABLE?

EXAMPLE: 1

```
SELECT AVG(SALARY) FROM EMPLOYEE;
+-------------+
| AVG(SALARY) |
+-------------+
|  46900.0000 |
+-------------+
1 row in set (0.00 sec)
```

EXAMPLE: 2

```
SELECT AVG(SALARY) "AVG SALARY" FROM EMPLOYEE;
+------------+
| AVG SALARY |
+------------+
| 46900.0000 |
+------------+
1 row in set (0.00 sec)
```

EXAMPLE: 3

```
SELECT AVG(AGE) "AVG AGE" FROM EMPLOYEE;
+---------+
| AVG AGE |
+---------+
| 26.0000 |
+---------+
1 row in set (0.00 sec)
```

RETRIEVE THE MINIMUM ASCII VALUE AMONG THE VALUES OF FIRST NAME COLUMN FROM THE EMPLOYEE TABLE?

```
SELECT MIN(FIRST_NAME) FROM EMPLOYEE;
+-----------------+
| MIN(FIRST_NAME) |
+-----------------+
|  ARUN           |
+-----------------+
1 row in set (0.00 sec)
```

RETRIEVE THE MAX ASCII VALUE AMONG THE VALUES OF FIRST NAME COLUMN FROM THE EMPLOYEE TABLE?

```
SELECT MAX(FIRST_NAME) FROM EMPLOYEE;
+-----------------+
| MAX(FIRST_NAME) |
+-----------------+
|  JANU           |
+-----------------+
1 row in set (0.00 sec)
```

DEMONSTRATE ORDER BY

```
SELECT * FROM EMPLOYEE ORDER BY FIRST_NAME;
```

- ORDER BY in MySQL is like telling the database how you want your results to be arranged or sorted when you retrieve them from a table.

- It is commonly used in conjunction with the SELECT statement.

- default sorting is ascending order.

ORDER EMPLOYEE RECORDS USING ORDER BY IN THE ASCENDING ORDER BY CONSIDERING FIRST NAME COLUMN?

```
SELECT * FROM EMPLOYEE ORDER BY FIRST_NAME;
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL     |   22 |  40000 | ARUN@GCOMPANY.IN     |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
```

```
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN    |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
+------+------------+------------+------+--------+-----------------------+
```

10 rows in set (0.00 sec)

ORDER EMPLOYEE RECORDS USING ORDER BY IN THE ASCENDING ORDER BY CONSIDERING FIRST NAME COLUMN USING AS KEYWORD?

SELECT * FROM EMPLOYEE ORDER BY FIRST_NAME ASC;

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL     |   22 |  40000 |  ARUN@GCOMPANY.IN    |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN   |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
```

10 rows in set (0.00 sec)

ORDER EMPLOYEE RECORDS USING ORDER BY IN THE DESCENDING ORDER BY CONSIDERING FIRST NAME COLUMN?

SELECT * FROM EMPLOYEE ORDER BY FIRST_NAME DESC;

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
```

```
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN    |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN     |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN   |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN   |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN   |
|    1 |  ARUN      |  PATEL     |   22 |  40000 |  ARUN@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
```

10 rows in set (0.00 sec)

ORDER EMPLOYEE RECORDS USING ORDER BY IN THE ASCENDING ORDER BY CONSIDERING AGE COLUMN?

SELECT * FROM EMPLOYEE ORDER BY AGE;

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN    |
|    1 |  ARUN      |  PATEL     |   22 |  40000 | ARUN@GCOMPANY.IN     |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN   |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN   |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN   |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN     |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN    |
+------+------------+------------+------+--------+----------------------+
10 rows in set (0.00 sec)
```

ORDER EMPLOYEE RECORDS USING ORDER BY IN THE ASCENDING ORDER BY CONSIDERING SALARY COLUMN?

SELECT * FROM EMPLOYEE ORDER BY SALARY;

ID	FIRST_NAME	LAST_NAME	AGE	SALARY	EMAIL
5	DHANUSH	KUMAR	25	20000	DHANUSH@GCOMPANY.IN
2	BHAVESH	SHARMA	24	30000	BHAVESH@GCOMPANY.IN
6	EKTA	YADAV	28	35000	YADAV@GCOMPANY.IN
1	ARUN	PATEL	22	40000	ARUN@GCOMPANY.IN
3	CHAITANYA	SINGH	23	50000	CHAITANYA@GCOMPANY.IN
10	JANU	MUKHERJEE	30	53000	JANU@GCOMPANY.IN
4	DEEPIKA	GUPTA	26	55000	DEEPIKA@GCOMPANY.IN
8	HARSHITA	REDDY	29	56000	HARSHITA@GCOMPANY.IN
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN
9	ISHAAN	REDDY	32	70000	ISHAAN@GCOMPANY.IN

10 rows in set (0.00 sec)

ORDER EMPLOYEE RECORDS USING ORDER BY IN THE ASCENDING ORDER BY CONSIDERING AGE AND SALARY COLUMNS?

Note: The first preference would be for the first column.If there are rows with the same value in column1, those rows will then be sorted by the values in column2 in ascending order. The default sorting is ascending order.

SELECT * FROM EMPLOYEE ORDER BY AGE, SALARY;

ID	FIRST_NAME	LAST_NAME	AGE	SALARY	EMAIL
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN

```
|    1 |  ARUN      |  PATEL     |   22 |  40000 |  ARUN@GCOMPANY.IN     |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN   |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN   |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN   |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN     |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN    |
|   11 | ARUL       |  PATEL     |   35 |  40000 |  ARUL@GCOMPANY.IN     |
|   12 | ADITI      |  PATEL     |   35 |  60000 |  ADITI@GCOMPANY.IN    |
+------+------------+------------+------+--------+----------------------+
12 rows in set (0.00 sec)
```

INSERT INTO EMPLOYEE VALUES(11, 'ARUL', 'PATEL', 35, 40000, 'ARUL@GCOMPANY.IN');

INSERT INTO EMPLOYEE VALUES(12, 'ADITI', 'PATEL', 35, 60000, 'ADITI@GCOMPANY.IN');

ORDER EMPLOYEE RECORDS USING ORDER BY AND AGE IN ASCENDING ORDER AND SALARY IN DESC ORDER?

SELECT * FROM EMPLOYEE ORDER BY AGE ASC, SALARY DESC;

Note: First considers the first column and sorts in the specified order, if two values of the first column are the same then it considers the second column and sorts in the specified order.

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN    |
|    1 |  ARUN      |  PATEL     |   22 |  40000 | ARUN@GCOMPANY.IN     |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
```

```
|    2 |  BHAVESH    |  SHARMA     |   24 |  30000 | BHAVESH@GCOMPANY.IN    |
|    5 |  DHANUSH    |  KUMAR      |   25 |  20000 | DHANUSH@GCOMPANY.IN    |
|    4 |  DEEPIKA    |  GUPTA      |   26 |  55000 | DEEPIKA@GCOMPANY.IN    |
|    6 |  EKTA       |  YADAV      |   28 |  35000 | YADAV@GCOMPANY.IN      |
|    8 | HARSHITA    |  REDDY      |   29 |  56000 | HARSHITA@GCOMPANY.IN   |
|   10 | JANU        |  MUKHERJEE  |   30 |  53000 | JANU@GCOMPANY.IN       |
|    9 | ISHAAN      |  REDDY      |   32 |  70000 | ISHAAN@GCOMPANY.IN     |
|   12 | ADITI       | PATEL       |   35 |  60000 | ADITI@GCOMPANY.IN     |
|   11 | ARUL        | PATEL       |   35 |  40000 | ARUL@GCOMPANY.IN      |
+------+------------+------------+------+--------+-----------------------+
12 rows in set (0.00 sec)
```

WHAT IF TWO VALUES OF THE SAME COLUMN ARE SAME?

INSERT INTO EMPLOYEE VALUES(13, 'ARTI', ' PATEL', 35, 10000, ' ARTI@GCOMPANY.IN');

SELECT * FROM EMPLOYEE ORDER BY AGE, SALARY;

Note: Then it considers the second colum minimum value

```
+------+------------+-----------+------+--------+-----------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL                 |
+------+------------+-----------+------+--------+-----------------------+
|    7 | GAURAV     | RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN    |
|    1 | ARUN       | PATEL     |   22 |  40000 | ARUN@GCOMPANY.IN      |
|    3 | CHAITANYA  | SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    2 | BHAVESH    | SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN   |
|    5 | DHANUSH    | KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN   |
|    4 | DEEPIKA    | GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN   |
|    6 | EKTA       | YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN     |
|    8 | HARSHITA   | REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
|   10 | JANU       | MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
|    9 | ISHAAN     | REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN    |
|   13 | ARTI       | PATEL     |   35 |  10000 | ARTI@GCOMPANY.IN      |
|   11 | ARUL       | PATEL     |   35 |  40000 | ARUL@GCOMPANY.IN      |
```

```
|   12 | ADITI      |  PATEL    |   35 |  60000 |  ADITI@GCOMPANY.IN    |
+------+------------+-----------+------+--------+-----------------------+
```

Note: We get error for the below query because MAX(SALARY) is not a column in the employee table.

```
//SELECT FIRST_NAME, MAX(SALAY) FROM EMPLOYEE;//ERROR
```

WHICH EMPLOYEE HAS THE HIGHEST SALARY, AND WHAT IS THEIR FIRST NAME?

```
SELECT FIRST_NAME FROM EMPLOYEE WHERE SALARY = (SELECT
MAX(SALARY) FROM EMPLOYEE);
+-------------+
| FIRST_NAME |
+-------------+
|  ISHAAN    |
+-------------+
1 row in set (0.00 sec)
```

WHICH EMPLOYEE HAS THE HIGHEST AGE, AND WHAT IS THEIR FIRST NAME?

```
SELECT FIRST_NAME FROM EMPLOYEE WHERE AGE = (SELECT
MAX(AGE) FROM EMPLOYEE);
+-------------+
| FIRST_NAME |
+-------------+
| ARUL       |
| ADITI      |
+-------------+
```

WHICH EMPLOYEE HAS THE LOWEST AGE, AND WHAT IS THEIR FIRST NAME?

```
SELECT FIRST_NAME FROM EMPLOYEE WHERE AGE = (SELECT
MIN(AGE) FROM EMPLOYEE);
+------------+
| FIRST_NAME |
+------------+
|  GAURAV    |
+------------+
1 row in set (0.00 sec)
```

WHICH EMPLOYEE HAS LESS THAN AVERAGE SALARY, AND WHAT IS THEIR FIRST NAME?

```
SELECT FIRST_NAME FROM EMPLOYEE WHERE SALARY < (SELECT
AVG(SALARY) FROM EMPLOYEE);
+------------+
| FIRST_NAME |
+------------+
|  ARUN      |
|  BHAVESH   |
|  DHANUSH   |
|  EKTA      |
| ARUL       |
+------------+
5 rows in set (0.00 sec)
```

WHAT IS THE MAXIMUM SALARY FROM THE EMPLOYEE TABLE?

```
SELECT MAX(SALARY) FROM EMPLOYEE;
+-------------+
| MAX(SALARY) |
+-------------+
|       70000 |
+-------------+
1 row in set (0.00 sec)
```

WHAT IS THE SECOND MAXIMUM SALARY IN THE EMPLOYEE TABLE?

```
SELECT MAX(SALARY) FROM EMPLOYEE WHERE SALARY < (SELECT
MAX(SALARY) FROM EMPLOYEE);
+-------------+
| MAX(SALARY) |
+-------------+
|       60000 |
+-------------+
1 row in set (0.00 sec)
```

WHAT IS THE SECOND MINIMUM SALARY IN THE EMPLOYEE TABLE?

```
SELECT MIN(SALARY) FROM EMPLOYEE WHERE SALARY > (SELECT
MIN(SALARY) FROM EMPLOYEE);
+-------------+
| MIN(SALARY) |
+-------------+
|       30000 |
```

```
+-------------+
1 row in set (0.00 sec)
```

WHICH EMPLOYEE HAS SECOND MINIMUM SALARY, AND WHAT IS THEIR FIRST NAME?

```
SELECT FIRST_NAME FROM EMPLOYEE WHERE SALARY = (SELECT
MIN(SALARY) FROM EMPLOYEE WHERE SALARY > (SELECT
MIN(SALARY) FROM EMPLOYEE));
+------------+
| FIRST_NAME |
+------------+
|  BHAVESH   |
+------------+
1 row in set (0.00 sec)
```

WHICH EMPLOYEE HAS SECOND MAXIMUM SALARY, AND WHAT IS THEIR FIRST NAME?

```
SELECT FIRST_NAME FROM EMPLOYEE WHERE SALARY = (SELECT
MAX(SALARY) FROM EMPLOYEE WHERE SALARY < (SELECT
MAX(SALARY) FROM EMPLOYEE));
+------------+
| FIRST_NAME |
+------------+
|  GAURAV    |
| ADITI      |
+------------+
2 rows in set (0.00 sec)
```

WHICH EMPLOYEE HAS SECOND MINIMUM SALARY, FETCH THEIR COMPLETE DETAILS?

```
SELECT * FROM EMPLOYEE WHERE SALARY = (SELECT MIN(SALARY) FROM EMPLOYEE WHERE SALARY > (SELECT MIN(SALARY) FROM EMPLOYEE));
```

ID	FIRST_NAME	LAST_NAME	AGE	SALARY	EMAIL
2	BHAVESH	SHARMA	24	30000	BHAVESH@GCOMPANY.IN

1 row in set (0.00 sec)

WHAT IS THE EMPLOYEE ID, FIRST NAME, LAST NAME, AGE, SALARY, EMAIL, AND RANK BASED ON SALARY IN DESCENDING ORDER FOR ALL EMPLOYEES?

Note: the RANK() function is a window function that assigns a rank to each row within a partition of a result set. It is commonly used to assign a rank to rows based on the values in one or more columns.

- The RANK() function assigns a rank to each row based on its position in the ordered list within each partition.
- Ties are handled by assigning the same rank to all tied rows.

```
SELECT ID, FIRST_NAME, LAST_NAME, AGE, SALARY, EMAIL, RANK() OVER (ORDER BY SALARY DESC) FROM EMPLOYEE;
```

ID	FIRST_NAME	LAST_NAME	AGE	SALARY	EMAIL	RANK() OVER (ORDER BY SALARY DESC)
9	ISHAAN	REDDY	32	70000	ISHAAN@GCOMPANY.IN	1
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN	2
12	ADITI	PATEL	35	60000	ADITI@GCOMPANY.IN	2
8	HARSHITA	REDDY	29	56000	HARSHITA@GCOMPANY.IN	4
4	DEEPIKA	GUPTA	26	55000	DEEPIKA@GCOMPANY.IN	5
10	JANU	MUKHERJEE	30	53000	JANU@GCOMPANY.IN	6

```
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |                                7 |
|    1 |  ARUN      |  PATEL     |   22 |  40000 |  ARUN@GCOMPANY.IN     |                                8 |
|   11 | ARUL       |  PATEL     |   35 |  40000 |  ARUL@GCOMPANY.IN     |                                8 |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN     |                               10 |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN   |                               11 |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN   |                               12 |
+------+------------+------------+------+--------+----------------------+----------------------------------+
12 rows in set (0.01 sec)
```

RETRIEVE THE DETAILS OF THE EMPLOYEE WITH THE SECOND-HIGHEST SALARY, INCLUDING ID, FIRST NAME, LAST NAME, AGE, SALARY, AND EMAIL?

```
SELECT * FROM (SELECT ID, FIRST_NAME, LAST_NAME, AGE, SALARY, EMAIL, RANK() OVER(ORDER BY
SALARY DESC) RANKED_EMPLOYEES FROM EMPLOYEE) AS RANKED_EMPLOYEES WHERE RANKED_EMPLOYEES = 2;
+------+------------+-----------+------+--------+--------------------+------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL              | RANKED_EMPLOYEES |
+------+------------+-----------+------+--------+--------------------+------------------+
|    7 |  GAURAV    |  RAO      |   21 |  60000 | GAURAV@GCOMPANY.IN |                2 |
|   12 | ADITI      |  PATEL    |   35 |  60000 |  ADITI@GCOMPANY.IN |                2 |
+------+------------+-----------+------+--------+--------------------+------------------+
2 rows in set (0.00 sec)
```

```
SELECT * FROM EMPLOYEE;
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL     |   22 |  40000 |  ARUN@GCOMPANY.IN    |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN   |
```

```
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
|   11 | ARUL       |  PATEL     |   35 |  40000 |  ARUL@GCOMPANY.IN     |
|   12 | ADITI      |  PATEL     |   35 |  60000 |  ADITI@GCOMPANY.IN    |
+------+------------+------------+------+--------+----------------------+
12 rows in set (0.00 sec)
```

```
DELETE FROM EMPLOYEE;
Query OK, 12 rows affected (0.01 sec)
```

INSERT THE SAME SET OF RECORDS 4 TIMES

```
INSERT INTO EMPLOYEE VALUES
  (1, 'ARUN', 'PATEL', 22, 40000, 'ARUN@GCOMPANY.IN'),
  (2, 'BHAVESH', 'SHARMA', 24, 30000,
'BHAVESH@GCOMPANY.IN'),
  (3, 'CHAITANYA', 'SINGH', 23, 50000,
'CHAITANYA@GCOMPANY.IN'),
  (4, 'DEEPIKA', 'GUPTA', 26, 55000,
'DEEPIKA@GCOMPANY.IN'),
  (5, 'DHANUSH', 'KUMAR', 25, 20000,
'DHANUSH@GCOMPANY.IN'),
  (6, 'EKTA', 'YADAV', 28, 35000, 'YADAV@GCOMPANY.IN'),
  (7, 'GAURAV', 'RAO', 21, 60000, 'GAURAV@GCOMPANY.IN'),
  (8, 'HARSHITA', 'REDDY', 29, 56000,
'HARSHITA@GCOMPANY.IN'),
  (9, 'ISHAAN', 'REDDY', 32, 70000, 'ISHAAN@GCOMPANY.IN'),
  (10, 'JANU', 'MUKHERJEE', 30, 53000, 'JANU@GCOMPANY.IN');
-------------------------------------------------------
INSERT INTO EMPLOYEE VALUES
  (1, 'ARUN', 'PATEL', 22, 40000, 'ARUN@GCOMPANY.IN'),
```

```
  (2, 'BHAVESH', 'SHARMA', 24, 30000,
'BHAVESH@GCOMPANY.IN'),

  (3, 'CHAITANYA', 'SINGH', 23, 50000,
'CHAITANYA@GCOMPANY.IN'),

  (4, 'DEEPIKA', 'GUPTA', 26, 55000,
'DEEPIKA@GCOMPANY.IN'),

  (5, 'DHANUSH', 'KUMAR', 25, 20000,
'DHANUSH@GCOMPANY.IN'),

  (6, 'EKTA', 'YADAV', 28, 35000, 'YADAV@GCOMPANY.IN'),

  (7, 'GAURAV', 'RAO', 21, 60000, 'GAURAV@GCOMPANY.IN'),

  (8, 'HARSHITA', 'REDDY', 29, 56000,
'HARSHITA@GCOMPANY.IN'),

  (9, 'ISHAAN', 'REDDY', 32, 70000, 'ISHAAN@GCOMPANY.IN'),

  (10, 'JANU', 'MUKHERJEE', 30, 53000, 'JANU@GCOMPANY.IN');
```

```
INSERT INTO EMPLOYEE VALUES

  (1, 'ARUN', 'PATEL', 22, 40000, 'ARUN@GCOMPANY.IN'),

  (2, 'BHAVESH', 'SHARMA', 24, 30000,
'BHAVESH@GCOMPANY.IN'),

  (3, 'CHAITANYA', 'SINGH', 23, 50000,
'CHAITANYA@GCOMPANY.IN'),

  (4, 'DEEPIKA', 'GUPTA', 26, 55000,
'DEEPIKA@GCOMPANY.IN'),

  (5, 'DHANUSH', 'KUMAR', 25, 20000,
'DHANUSH@GCOMPANY.IN'),

  (6, 'EKTA', 'YADAV', 28, 35000, 'YADAV@GCOMPANY.IN'),

  (7, 'GAURAV', 'RAO', 21, 60000, 'GAURAV@GCOMPANY.IN'),

  (8, 'HARSHITA', 'REDDY', 29, 56000,
'HARSHITA@GCOMPANY.IN'),

  (9, 'ISHAAN', 'REDDY', 32, 70000, 'ISHAAN@GCOMPANY.IN'),
```

```
  (10, 'JANU', 'MUKHERJEE', 30, 53000, 'JANU@GCOMPANY.IN');
-------------------------------------------------------
INSERT INTO EMPLOYEE VALUES
  (1, 'ARUN', 'PATEL', 22, 40000, 'ARUN@GCOMPANY.IN'),
  (2, 'BHAVESH', 'SHARMA', 24, 30000,
'BHAVESH@GCOMPANY.IN'),
  (3, 'CHAITANYA', 'SINGH', 23, 50000,
'CHAITANYA@GCOMPANY.IN'),
  (4, 'DEEPIKA', 'GUPTA', 26, 55000,
'DEEPIKA@GCOMPANY.IN'),
  (5, 'DHANUSH', 'KUMAR', 25, 20000,
'DHANUSH@GCOMPANY.IN'),
  (6, 'EKTA', 'YADAV', 28, 35000, 'YADAV@GCOMPANY.IN'),
  (7, 'GAURAV', 'RAO', 21, 60000, 'GAURAV@GCOMPANY.IN'),
  (8, 'HARSHITA', 'REDDY', 29, 56000,
'HARSHITA@GCOMPANY.IN'),
  (9, 'ISHAAN', 'REDDY', 32, 70000, 'ISHAAN@GCOMPANY.IN'),
  (10, 'JANU', 'MUKHERJEE', 30, 53000, 'JANU@GCOMPANY.IN');
```

TOTAL NUMBER OF RECORDS

```
SELECT COUNT(*) FROM EMPLOYEE;
+----------+
| COUNT(*) |
+----------+
|       40 |
+----------+
1 row in set (0.01 sec)
```

```
SELECT * FROM EMPLOYEE;

SET @row_number = 0;
SELECT ID, FIRST_NAME, LAST_NAME, AGE, EMAIL, SALARY,
(@row_number:=@row_number + 1) AS ROWNUM FROM EMPLOYEE;
```

SET @row_number = 0; initializes a user-defined variable @row_number and sets it to 0.

(@row_number:=@row_number + 1) AS ROWNUM increments the @row_number variable for each row, effectively assigning a row number to each result.

```
SELECT ID, FIRST_NAME, LAST_NAME, AGE, EMAIL,
SALARY,(@row_number:=@row_number + 1) AS ROWNUM FROM
EMPLOYEE;
```

ID	FIRST_NAME	LAST_NAME	AGE	EMAIL	SALARY	ROWNUM
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000	1
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000	2
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000	3
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000	4
5	DHANUSH	KUMAR	25	DHANUSH@GCOMPANY.IN	20000	5
6	EKTA	YADAV	28	YADAV@GCOMPANY.IN	35000	6
7	GAURAV	RAO	21	GAURAV@GCOMPANY.IN	60000	7
8	HARSHITA	REDDY	29	HARSHITA@GCOMPANY.IN	56000	8
9	ISHAAN	REDDY	32	ISHAAN@GCOMPANY.IN	70000	9
10	JANU	MUKHERJEE	30	JANU@GCOMPANY.IN	53000	10
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000	11
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000	12
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000	13
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000	14

```
|    5 |  DHANUSH   |  KUMAR     |   25 | DHANUSH@GCOMPANY.IN   |  20000 |     15 |
|    6 |  EKTA      |  YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |     16 |
|    7 |  GAURAV    |  RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |     17 |
|    8 |  HARSHITA  |  REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |     18 |
|    9 |  ISHAAN    |  REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |     19 |
|   10 |  JANU      |  MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |     20 |
|    1 |  ARUN      |  PATEL     |   22 |  ARUN@GCOMPANY.IN     |  40000 |     21 |
|    2 |  BHAVESH   |  SHARMA    |   24 | BHAVESH@GCOMPANY.IN   |  30000 |     22 |
|    3 |  CHAITANYA |  SINGH     |   23 | CHAITANYA@GCOMPANY.IN |  50000 |     23 |
|    4 |  DEEPIKA   |  GUPTA     |   26 | DEEPIKA@GCOMPANY.IN   |  55000 |     24 |
|    5 |  DHANUSH   |  KUMAR     |   25 | DHANUSH@GCOMPANY.IN   |  20000 |     25 |
|    6 |  EKTA      |  YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |     26 |
|    7 |  GAURAV    |  RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |     27 |
|    8 |  HARSHITA  |  REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |     28 |
|    9 |  ISHAAN    |  REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |     29 |
|   10 |  JANU      |  MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |     30 |
|    1 |  ARUN      |  PATEL     |   22 |  ARUN@GCOMPANY.IN     |  40000 |     31 |
|    2 |  BHAVESH   |  SHARMA    |   24 | BHAVESH@GCOMPANY.IN   |  30000 |     32 |
|    3 |  CHAITANYA |  SINGH     |   23 | CHAITANYA@GCOMPANY.IN |  50000 |     33 |
|    4 |  DEEPIKA   |  GUPTA     |   26 | DEEPIKA@GCOMPANY.IN   |  55000 |     34 |
|    5 |  DHANUSH   |  KUMAR     |   25 | DHANUSH@GCOMPANY.IN   |  20000 |     35 |
|    6 |  EKTA      |  YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |     36 |
|    7 |  GAURAV    |  RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |     37 |
|    8 |  HARSHITA  |  REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |     38 |
|    9 |  ISHAAN    |  REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |     39 |
|   10 |  JANU      |  MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |     40 |
+------+------------+------------+------+-----------------------+--------+--------+
40 rows in set, 1 warning (0.00 sec)
```

PAGINATION IN MYSQL

Even if we have so many records in a table what if I want to display a particular number of records. In such case we can use pagination concept. In case of Oracle We have rownum but in mysql we don’t have that.

```
SET @row_number = 0;
Query OK, 0 rows affected (0.00 sec)

SELECT ID, FIRST_NAME, LAST_NAME, AGE, EMAIL,
SALARY,(@row_number:=@row_number + 1) AS RN FROM EMPLOYEE
ORDER BY ID;
```

ID	FIRST_NAME	LAST_NAME	AGE	EMAIL	SALARY	RN
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000	1
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000	2
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000	3
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000	4
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000	5
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000	6
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000	7
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000	8
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000	9
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000	10
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000	11
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000	12
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000	13
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000	14
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000	15
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000	16
5	DHANUSH	KUMAR	25	DHANUSH@GCOMPANY.IN	20000	17
5	DHANUSH	KUMAR	25	DHANUSH@GCOMPANY.IN	20000	18
5	DHANUSH	KUMAR	25	DHANUSH@GCOMPANY.IN	20000	19
5	DHANUSH	KUMAR	25	DHANUSH@GCOMPANY.IN	20000	20

```
|    6 | EKTA       | YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |   21 |
|    6 | EKTA       | YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |   22 |
|    6 | EKTA       | YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |   23 |
|    6 | EKTA       | YADAV     |   28 | YADAV@GCOMPANY.IN     |  35000 |   24 |
|    7 | GAURAV     | RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |   25 |
|    7 | GAURAV     | RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |   26 |
|    7 | GAURAV     | RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |   27 |
|    7 | GAURAV     | RAO       |   21 | GAURAV@GCOMPANY.IN    |  60000 |   28 |
|    8 | HARSHITA   | REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |   29 |
|    8 | HARSHITA   | REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |   30 |
|    8 | HARSHITA   | REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |   31 |
|    8 | HARSHITA   | REDDY     |   29 | HARSHITA@GCOMPANY.IN  |  56000 |   32 |
|    9 | ISHAAN     | REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |   33 |
|    9 | ISHAAN     | REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |   34 |
|    9 | ISHAAN     | REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |   35 |
|    9 | ISHAAN     | REDDY     |   32 | ISHAAN@GCOMPANY.IN    |  70000 |   36 |
|   10 | JANU       | MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |   37 |
|   10 | JANU       | MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |   38 |
|   10 | JANU       | MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |   39 |
|   10 | JANU       | MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |   40 |
+------+------------+-----------+------+----------------------+--------+------+
40 rows in set, 1 warning (0.00 sec)
```

MYSQL LIMIT KEYWORD

LIMIT is used to restrict the number of rows returned by a query.

It takes one or two arguments: LIMIT x or LIMIT x, y.

x specifies the maximum number of rows to return.

y (optional) specifies the offset or the number of rows to skip before starting to return rows.

RETRIEVE THE FIRST 5 ROWS FROM A TABLE

```
SELECT * FROM EMPLOYEE LIMIT 5;
+------+------------+-----------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL                |
+------+------------+-----------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL    |   22 |  40000 |  ARUN@GCOMPANY.IN    |
|    2 |  BHAVESH   |  SHARMA   |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH    |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA    |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR    |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
+------+------------+-----------+------+--------+----------------------+
5 rows in set (0.00 sec)
```

LIMIT 5, 5

First value: Specifies the offset, which is the number of rows to skip before starting to retrieve data.

Second value: Specifies the limit, which is the maximum number of rows to retrieve after the offset(first number).

RETRIEVE ROWS 6 THROUGH 10 FROM A TABLE.

SELECT * FROM EMPLOYEE LIMIT 5, 5;

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN   |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
5 rows in set (0.00 sec)
```

USING LIMIT WITH OFFSET

OFFSET is used to skip a specified number of rows before starting to return rows.

It's usually used in combination with LIMIT.

The OFFSET value starts from 0.

SKIP THE FIRST 3 ROWS AND RETURN THE NEXT 5

```
SELECT * FROM EMPLOYEE LIMIT 5 OFFSET 3;
+------+------------+-----------+------+--------+---------------------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | SALARY | EMAIL               |
+------+------------+-----------+------+--------+---------------------+
|    4 |  DEEPIKA   |  GUPTA    |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR    |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV    |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO      |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY    |   29 |  56000 | HARSHITA@GCOMPANY.IN |
+------+------------+-----------+------+--------+---------------------+
5 rows in set (0.00 sec)
```

Alternatively, you can use the shorter form LIMIT x, y where x is the offset and y is the number of rows to return.

SKIP THE FIRST 2 ROWS AND RETURN THE NEXT 8

```
SELECT * FROM EMPLOYEE LIMIT 2, 8;
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN   |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN   |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN     |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN  |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN    |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN      |
+------+------------+------------+------+--------+----------------------+
8 rows in set (0.00 sec)
```

HOW TO FETCH ALTERNATIVE RECORDS FROM A TABLE

```
SELECT * FROM EMPLOYEE WHERE MOD(id, 2) = 0;
```

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
20 rows in set (0.00 sec)
```

MOD(id, 2) calculates the remainder when id is divided by 2. This will be 0 for even ids and 1 for odd ids.

WHERE MOD(id, 2) = 0 filters the rows to only include those where the id is even.

This query will retrieve all the rows with even id values from the EMPLOYEE.

WHAT IF THE TABLE DOESN'T HAVE ID COLUMN

```
SET @row_number := -1;

SELECT * FROM (SELECT *,@row_number := @row_number + 1 AS
row_num FROM EMPLOYEE) AS numbered_table WHERE row_num % 2
= 0;
```

ID	FIRST_NAME	LAST_NAME	AGE	SALARY	EMAIL	row_num
1	ARUN	PATEL	22	40000	ARUN@GCOMPANY.IN	0
3	CHAITANYA	SINGH	23	50000	CHAITANYA@GCOMPANY.IN	2
5	DHANUSH	KUMAR	25	20000	DHANUSH@GCOMPANY.IN	4
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN	6
9	ISHAAN	REDDY	32	70000	ISHAAN@GCOMPANY.IN	8
1	ARUN	PATEL	22	40000	ARUN@GCOMPANY.IN	10
3	CHAITANYA	SINGH	23	50000	CHAITANYA@GCOMPANY.IN	12
5	DHANUSH	KUMAR	25	20000	DHANUSH@GCOMPANY.IN	14
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN	16
9	ISHAAN	REDDY	32	70000	ISHAAN@GCOMPANY.IN	18
1	ARUN	PATEL	22	40000	ARUN@GCOMPANY.IN	20
3	CHAITANYA	SINGH	23	50000	CHAITANYA@GCOMPANY.IN	22
5	DHANUSH	KUMAR	25	20000	DHANUSH@GCOMPANY.IN	24
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN	26
9	ISHAAN	REDDY	32	70000	ISHAAN@GCOMPANY.IN	28
1	ARUN	PATEL	22	40000	ARUN@GCOMPANY.IN	30
3	CHAITANYA	SINGH	23	50000	CHAITANYA@GCOMPANY.IN	32
5	DHANUSH	KUMAR	25	20000	DHANUSH@GCOMPANY.IN	34
7	GAURAV	RAO	21	60000	GAURAV@GCOMPANY.IN	36
9	ISHAAN	REDDY	32	70000	ISHAAN@GCOMPANY.IN	38

20 rows in set, 1 warning (0.00 sec)

Explanation:

SET @row_number := -1;: Initializes a user-defined variable @row_number and sets it to -1. This variable will be used to assign a row number to each record.

SELECT *, @row_number := @row_number + 1 AS row_num FROM my_table: This subquery assigns a row number to each record. The @row_number variable is incremented by 1 for each row, effectively numbering the rows.

AS numbered_table: This gives the subquery a name (numbered_table) that we can reference in the outer query.

WHERE row_num % 2 = 0;: This condition selects only the rows where the row number is even. This effectively gives you alternative records.

USING DISTINCT

SELECT DISTINCT ID, FIRST_NAME, LAST_NAME, AGE, EMAIL, SALARY FROM EMPLOYEE;

ID	FIRST_NAME	LAST_NAME	AGE	EMAIL	SALARY
1	ARUN	PATEL	22	ARUN@GCOMPANY.IN	40000
2	BHAVESH	SHARMA	24	BHAVESH@GCOMPANY.IN	30000
3	CHAITANYA	SINGH	23	CHAITANYA@GCOMPANY.IN	50000
4	DEEPIKA	GUPTA	26	DEEPIKA@GCOMPANY.IN	55000
5	DHANUSH	KUMAR	25	DHANUSH@GCOMPANY.IN	20000
6	EKTA	YADAV	28	YADAV@GCOMPANY.IN	35000
7	GAURAV	RAO	21	GAURAV@GCOMPANY.IN	60000
8	HARSHITA	REDDY	29	HARSHITA@GCOMPANY.IN	56000
9	ISHAAN	REDDY	32	ISHAAN@GCOMPANY.IN	70000

```
|   10 |  JANU      |  MUKHERJEE |   30 | JANU@GCOMPANY.IN      |  53000 |
+------+------------+------------+------+----------------------+--------+
10 rows in set (0.00 sec)
```

- If we want to get only unique records then we should use DISTINCT.
- If 2 records has same ID, FIRST_NAME, LAST_NAME, AGE, EMAIL, SALARY in the EMPLOYEE table then only one record will be selected.

USING GROUP BY

SELECT * FROM EMPLOYEE GROUP BY ID, FIRST_NAME, LAST_NAME, AGE, EMAIL, SALARY;

```
+------+------------+------------+------+--------+----------------------+
| ID   | FIRST_NAME | LAST_NAME  | AGE  | SALARY | EMAIL                |
+------+------------+------------+------+--------+----------------------+
|    1 |  ARUN      |  PATEL     |   22 |  40000 |  ARUN@GCOMPANY.IN    |
|    2 |  BHAVESH   |  SHARMA    |   24 |  30000 | BHAVESH@GCOMPANY.IN  |
|    3 |  CHAITANYA |  SINGH     |   23 |  50000 | CHAITANYA@GCOMPANY.IN |
|    4 |  DEEPIKA   |  GUPTA     |   26 |  55000 | DEEPIKA@GCOMPANY.IN  |
|    5 |  DHANUSH   |  KUMAR     |   25 |  20000 | DHANUSH@GCOMPANY.IN  |
|    6 |  EKTA      |  YADAV     |   28 |  35000 | YADAV@GCOMPANY.IN    |
|    7 |  GAURAV    |  RAO       |   21 |  60000 | GAURAV@GCOMPANY.IN   |
|    8 |  HARSHITA  |  REDDY     |   29 |  56000 | HARSHITA@GCOMPANY.IN |
|    9 |  ISHAAN    |  REDDY     |   32 |  70000 | ISHAAN@GCOMPANY.IN   |
|   10 |  JANU      |  MUKHERJEE |   30 |  53000 | JANU@GCOMPANY.IN     |
+------+------------+------------+------+--------+----------------------+
10 rows in set (0.00 sec)
```

- Whichever the records has same ID, FIRST_NAME, LAST_NAME, AGE, EMAIL, SALARY in the EMPLOYEE table are grouping into one.
- Totally 10 groups are creating, each group contains 4 records of same data.
- From every group only one record is displayed.
- DISTINCT and GROUP BY are similar.

- MySQL does not have a built-in concept of a "ROWID" like some other databases (e.g., Oracle) do. In MySQL, you typically rely on primary keys (which are unique) to uniquely identify rows in a table.

USE OF CONSTRAINTS

```
DROP TABLE IF EXISTS WORKTAB1;

CREATE TABLE WORKTAB1(ID INTEGER, NAME VARCHAR2(90), AGE INTEGER);

INSERT INTO WORKTAB1(ID) VALUES(1);

SELECT * FROM WORKTAB1;

+------+------+------+

| ID   | NAME | AGE  |

+------+------+------+

|    1 | NULL | NULL |

+------+------+------+

1 row in set (0.00 sec)
```

- By default column allows NULL values.

```
INSERT INTO WORKTAB1(ID, NAME) VALUES(2, 'ABC');
SELECT * FROM WORKTAB1;
+------+------+------+
| ID   | NAME | AGE  |
+------+------+------+
|    1 | NULL | NULL |
|    2 | ABC  | NULL |
+------+------+------+
2 rows in set (0.00 sec)

INSERT INTO WORKTAB1(ID, AGE) VALUES(3, 33);
Query OK, 1 row affected (0.01 sec)

SELECT * FROM WORKTAB1;
+------+------+------+
| ID   | NAME | AGE  |
+------+------+------+
|    1 | NULL | NULL |
|    2 | ABC  | NULL |
|    3 | NULL |   33 |
+------+------+------+
3 rows in set (0.00 sec)
```

```
INSERT INTO WORKTAB1(NAME, AGE) VALUES('AMAN', 23);
Query OK, 1 row affected (0.01 sec)
SELECT * FROM WORKTAB1;
+------+------+------+
| ID   | NAME | AGE  |
+------+------+------+
|    1 | NULL | NULL |
|    2 | ABC  | NULL |
|    3 | NULL |   33 |
| NULL | AMAN |   23 |
+------+------+------+
4 rows in set (0.00 sec)

INSERT INTO WORKTAB1(NAME) VALUES('MANOHAR');
Query OK, 1 row affected (0.01 sec)
SELECT * FROM WORKTAB1;
+------+---------+------+
| ID   | NAME    | AGE  |
+------+---------+------+
|    1 | NULL    | NULL |
|    2 | ABC     | NULL |
|    3 | NULL    |   33 |
| NULL | AMAN    |   23 |
| NULL | MANOHAR | NULL |
+------+---------+------+
5 rows in set (0.00 sec)
```

```
INSERT INTO WORKTAB1(AGE) VALUES(25);
Query OK, 1 row affected (0.00 sec)
SELECT * FROM WORKTAB1;
+------+---------+------+
| ID   | NAME    | AGE  |
+------+---------+------+
|    1 | NULL    | NULL |
|    2 | ABC     | NULL |
|    3 | NULL    |   33 |
| NULL | AMAN    |   23 |
| NULL | MANOHAR | NULL |
| NULL | NULL    |   25 |
+------+---------+------+
6 rows in set (0.00 sec)
```

```
DROP TABLE IF EXISTS WORKTAB2;

Query OK, 0 rows affected, 1 warning (0.01 sec)

CREATE TABLE WORKTAB2(ID INTEGER, NAME VARCHAR(90) NOT
NULL, AGE INTEGER);

Query OK, 0 rows affected (0.03 sec)
```

DESC used to provide information about the structure of the table

```
DESC WORKTAB2;

+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| ID    | int         | YES  |     | NULL    |       |
| NAME  | varchar(90) | NO   |     | NULL    |       |
| AGE   | int         | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+

3 rows in set (0.01 sec)
```

- By using NOT NULL we can make sure that column are not having null values.
- In one table any number of columns can be NOT NULL.

```
INSERT INTO WORKTAB2(ID) VALUES(1);

ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value


INSERT INTO WORKTAB2(ID, NAME) VALUES(2, 'AMAN');

Query OK, 1 row affected (0.01 sec)
```

```
SELECT * FROM WORKTAB2;
+------+------+------+
| ID   | NAME | AGE  |
+------+------+------+
|    2 | AMAN | NULL |
+------+------+------+
1 row in set (0.00 sec)

INSERT INTO WORKTAB2(ID, AGE) VALUES(3, 33);
ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value

INSERT INTO WORKTAB2(NAME, AGE) VALUES('MADHU', 23);
Query OK, 1 row affected (0.01 sec)
SELECT * FROM WORKTAB2;
+------+-------+------+
| ID   | NAME  | AGE  |
+------+-------+------+
|    2 | AMAN  | NULL |
| NULL | MADHU |   23 |
+------+-------+------+
2 rows in set (0.00 sec)
```

```
INSERT INTO WORKTAB2(NAME) VALUES('MANOHAR');
Query OK, 1 row affected (0.01 sec)
SELECT * FROM WORKTAB2;
+------+---------+------+
| ID   | NAME    | AGE  |
+------+---------+------+
|    2 | AMAN    | NULL |
| NULL | MADHU   |   23 |
| NULL | MANOHAR | NULL |
+------+---------+------+
3 rows in set (0.00 sec)

INSERT INTO WORKTAB2(AGE) VALUES(25);
ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value
SELECT * FROM WORKTAB2;
+------+---------+------+
| ID   | NAME    | AGE  |
+------+---------+------+
|    2 | AMAN    | NULL |
| NULL | MADHU   |   23 |
| NULL | MANOHAR | NULL |
+------+---------+------+
3 rows in set (0.00 sec)
```

```
DROP TABLE IF EXISTS WORKTAB3;

Query OK, 0 rows affected, 1 warning (0.01 sec)

CREATE TABLE WORKTAB3(ID INTEGER NOT NULL, NAME VARCHAR(90)
NOT NULL, AGE INTEGER);

Query OK, 0 rows affected (0.02 sec)

DESC WORKTAB3;

+-------+-------------+------+-----+---------+-------+

| Field | Type        | Null | Key | Default | Extra |

+-------+-------------+------+-----+---------+-------+

| ID    | int         | NO   |     | NULL    |       |

| NAME  | varchar(90) | NO   |     | NULL    |       |

| AGE   | int         | YES  |     | NULL    |       |

+-------+-------------+------+-----+---------+-------+

3 rows in set (0.01 sec)


INSERT INTO WORKTAB3(ID) VALUES(1);

ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value


INSERT INTO WORKTAB3(ID, NAME) VALUES(2, 'AMAN');

Query OK, 1 row affected (0.00 sec)

SELECT * FROM WORKTAB3;

+----+------+------+

| ID | NAME | AGE  |

+----+------+------+

|  2 | AMAN | NULL |

+----+------+------+

1 row in set (0.00 sec)
```

```
INSERT INTO WORKTAB3(ID, AGE) VALUES(3, 33);
ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value

INSERT INTO WORKTAB3(NAME, AGE) VALUES('MADHU', 23);
ERROR 1364 (HY000): Field 'ID' doesn't have a default value

INSERT INTO WORKTAB3(NAME) VALUES('MADHU');
ERROR 1364 (HY000): Field 'ID' doesn't have a default value

INSERT INTO WORKTAB3(AGE) VALUES(25);
ERROR 1364 (HY000): Field 'ID' doesn't have a default value

SELECT * FROM WORKTAB3;
+----+------+------+
| ID | NAME | AGE  |
+----+------+------+
|  2 | AMAN | NULL |
+----+------+------+
1 row in set (0.00 sec)
```

```
DROP TABLE WORKTAB4;
ERROR 1051 (42S02): Unknown table 'mysql_notes.worktab4'
DROP TABLE IF EXISTS WORKTAB4;
Query OK, 0 rows affected, 1 warning (0.01 sec)

CREATE TABLE WORKTAB4(ID INTEGER, NAME VARCHAR(90), AGE
INTEGER);
Query OK, 0 rows affected (0.03 sec)

SELECT * FROM WORKTAB4;
Empty set (0.00 sec)

DESC WORKTAB4;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| ID    | int         | YES  |     | NULL    |       |
| NAME  | varchar(90) | YES  |     | NULL    |       |
| AGE   | int         | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

```
INSERT INTO WORKTAB4(ID, NAME) VALUES(1, 'MANOHAR');
INSERT INTO WORKTAB4(ID, NAME) VALUES(1, 'MANOHAR');
INSERT INTO WORKTAB4(ID, NAME, AGE) VALUES(2, 'AMAN', 22);
INSERT INTO WORKTAB4(ID, NAME, AGE) VALUES(2, 'AMAN', 22);
INSERT INTO WORKTAB4(NAME, AGE) VALUES('EHTESHAM', 22);
INSERT INTO WORKTAB4(NAME, AGE) VALUES('EHTESHAM', 22);

SELECT * FROM WORKTAB4;
+------+----------+------+
| ID   | NAME     | AGE  |
+------+----------+------+
|    1 | MANOHAR  | NULL |
|    1 | MANOHAR  | NULL |
|    2 | AMAN     |   22 |
|    2 | AMAN     |   22 |
| NULL | EHTESHAM |   22 |
| NULL | EHTESHAM |   22 |
+------+----------+------+
6 rows in set (0.00 sec)
```

```
DROP TABLE IF EXISTS WORKTAB5;

CREATE TABLE WORKTAB5(ID INTEGER, NAME VARCHAR(90) UNIQUE,
AGE INTEGER);

DESC WORKTAB5;

+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| ID    | int         | YES  |     | NULL    |       |
| NAME  | varchar(90) | YES  | UNI | NULL    |       |
| AGE   | int         | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

- By default columns allow duplicate values.
- In one table any number of columns can be UNIQUE
- By using UNIQUE we can avoid duplicate values in the same column in the table.
- UNIQUE column allows any number of NULL values but not duplicate values.
- Two NULL values are not same i.e. they are not duplicate.

```
INSERT INTO WORKTAB5(ID, NAME) VALUES(1, 'MANOHAR');

Query OK, 1 row affected (0.01 sec)


INSERT INTO WORKTAB5(ID, NAME) VALUES(1, 'MANOHAR');

ERROR 1062 (23000): Duplicate entry 'MANOHAR' for key
'worktab5.NAME'
```

```
INSERT INTO WORKTAB5(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

Query OK, 1 row affected (0.00 sec)

INSERT INTO WORKTAB5(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

ERROR 1062 (23000): Duplicate entry 'AMAN' for key
'worktab5.NAME'

INSERT INTO WORKTAB5(NAME, AGE) VALUES('AMAN', 22);

ERROR 1062 (23000): Duplicate entry 'AMAN' for key
'worktab5.NAME'

INSERT INTO WORKTAB5(NAME, AGE) VALUES('EHSTESHAM', 22);

Query OK, 1 row affected (0.00 sec)

INSERT INTO WORKTAB5(ID, AGE) VALUES(3, 22);

Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB5(ID, AGE) VALUES(3, 22);

Query OK, 1 row affected (0.00 sec)


SELECT * FROM WORKTAB5;

+------+-----------+------+

| ID   | NAME      | AGE  |

+------+-----------+------+

|    1 | MANOHAR   | NULL |

|    2 | AMAN      |   22 |

| NULL | EHSTESHAM |   22 |

|    3 | NULL      |   22 |

|    3 | NULL      |   22 |

+------+-----------+------+

5 rows in set (0.00 sec)
```

```
DROP TABLE IF EXISTS WORKTAB6;
Query OK, 0 rows affected, 1 warning (0.00 sec)

CREATE TABLE WORKTAB6(ID INTEGER, NAME VARCHAR(90) UNIQUE,
AGE INTEGER UNIQUE);
Query OK, 0 rows affected (0.03 sec)

DESC WORKTAB6;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| ID    | int         | YES  |     | NULL    |       |
| NAME  | varchar(90) | YES  | UNI | NULL    |       |
| AGE   | int         | YES  | UNI | NULL    |       |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)

INSERT INTO WORKTAB6(ID, NAME) VALUES(1, 'MANOHAR');
Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB6(ID, NAME) VALUES(1, 'MANOHAR');
ERROR 1062 (23000): Duplicate entry 'MANOHAR' for key
'worktab6.NAME'
INSERT INTO WORKTAB6(ID, NAME, AGE) VALUES(2, 'AMAN', 22);
Query OK, 1 row affected (0.00 sec)
```

```
INSERT INTO WORKTAB6(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

ERROR 1062 (23000): Duplicate entry 'AMAN' for key
'worktab6.NAME'


INSERT INTO WORKTAB6(NAME, AGE) VALUES('AMAN', 22);

ERROR 1062 (23000): Duplicate entry 'AMAN' for key
'worktab6.NAME'


INSERT INTO WORKTAB6(ID, AGE) VALUES(5, 22);

ERROR 1062 (23000): Duplicate entry '22' for key
'worktab6.AGE'


INSERT INTO WORKTAB6(ID) VALUES(5);

Query OK, 1 row affected (0.00 sec)


INSERT INTO WORKTAB6(ID) VALUES(5);

Query OK, 1 row affected (0.01 sec)


SELECT * FROM WORKTAB6;

+------+---------+------+

| ID   | NAME    | AGE  |

+------+---------+------+

|    1 | MANOHAR | NULL |

|    2 | AMAN    |   22 |

|    5 | NULL    | NULL |

|    5 | NULL    | NULL |

+------+---------+------+

4 rows in set (0.00 sec)
```

```
DROP TABLE IF EXISTS WORKTAB7;
Query OK, 0 rows affected, 1 warning (0.01 sec)

CREATE TABLE WORKTAB7(ID INTEGER, NAME VARCHAR(90), AGE
INTEGER, CONSTRAINT WORKTAB7_UK1 UNIQUE(NAME), CONSTRAINT
WORKTAB7_UK2 UNIQUE(AGE));
Query OK, 0 rows affected (0.03 sec)
```

- Syntax CONSTRAINT(declaration) WORKTAB7_UK1(IDENTIFIER) UNIQUE(NAME)(type of the constraint and column name)
- Every constraints should be having unique identifier names in across the tables.
- We can disable or permanently drop the constraints. It is the better approach than previous.

```
INSERT INTO WORKTAB7(ID, NAME) VALUES(1, 'MANOHAR');
Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB7(ID, NAME) VALUES(1, 'MANOHAR');
ERROR 1062 (23000): Duplicate entry 'MANOHAR' for key
'worktab7.WORKTAB7_UK1'

INSERT INTO WORKTAB7(ID, NAME, AGE) VALUES(2, 'AMAN', 22);
Query OK, 1 row affected (0.00 sec)

INSERT INTO WORKTAB7(ID, NAME, AGE) VALUES(2, 'AMAN', 22);
ERROR 1062 (23000): Duplicate entry 'AMAN' for key
'worktab7.WORKTAB7_UK1'
```

```
INSERT INTO WORKTAB7(NAME, AGE) VALUES('EHSTESHAM', 22);

ERROR 1062 (23000): Duplicate entry '22' for key
'worktab7.WORKTAB7_UK2'


INSERT INTO WORKTAB7(ID, AGE) VALUES(5, 22);

ERROR 1062 (23000): Duplicate entry '22' for key
'worktab7.WORKTAB7_UK2'


INSERT INTO WORKTAB7(ID) VALUES(5);

Query OK, 1 row affected (0.03 sec)


INSERT INTO WORKTAB7(ID) VALUES(6);

Query OK, 1 row affected (0.00 sec)


SELECT * FROM WORKTAB7;

+------+---------+------+

| ID   | NAME    | AGE  |

+------+---------+------+

|    1 | MANOHAR | NULL |

|    2 | AMAN    |   22 |

|    5 | NULL    | NULL |

|    6 | NULL    | NULL |

+------+---------+------+

4 rows in set (0.00 sec)
```

```
DROP TABLE IF EXISTS WORKTAB8;
Query OK, 0 rows affected, 1 warning (0.01 sec)

CREATE TABLE WORKTAB8(ID INTEGER, NAME VARCHAR(90), AGE
INTEGER, CONSTRAINT WORKTAB8_UK1 UNIQUE(NAME, AGE));
Query OK, 0 rows affected (0.02 sec)

INSERT INTO WORKTAB8(ID, NAME) VALUES(1, 'AMAN');
Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB8(ID, NAME) VALUES(1, 'AMAN');
Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB8(ID, NAME) VALUES(1, 'AMAN');
Query OK, 1 row affected (0.00 sec)

DESC WORKTAB8;
+-------+-------------+------+-----+---------+-------+
| Field | Type        | Null | Key | Default | Extra |
+-------+-------------+------+-----+---------+-------+
| ID    | int         | YES  |     | NULL    |       |
| NAME  | varchar(90) | YES  | MUL | NULL    |       |
| AGE   | int         | YES  |     | NULL    |       |
+-------+-------------+------+-----+---------+-------+
3 rows in set (0.00 sec)
```

- In the above constraint two records cant be having same values for the NAME and AGE columns.
- We can refer to it as a composite unique key.

```
INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'AMAN', 22);

Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'AMAN', 22);

ERROR 1062 (23000): Duplicate entry 'AMAN-22' for key
'worktab8.WORKTAB8_UK1'

INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'AMAN', 23);

Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'AMAN', 23);

ERROR 1062 (23000): Duplicate entry 'AMAN-23' for key
'worktab8.WORKTAB8_UK1'

INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'AMAN', 24);

Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'MANOHAR',
25);

Query OK, 1 row affected (0.01 sec)


INSERT INTO WORKTAB8(ID, NAME, AGE) VALUES(1, 'EHTESHAM',
25);

Query OK, 1 row affected (0.00 sec)

INSERT INTO WORKTAB8(ID) VALUES(6);

Query OK, 1 row affected (0.01 sec)


INSERT INTO WORKTAB8(ID) VALUES(6);

Query OK, 1 row affected (0.00 sec)
```

- We don’t get error because NULL, NULL is not considered as combination.

```
INSERT INTO WORKTAB8(ID, NAME) VALUES(1, 'AMAN');
Query OK, 1 row affected (0.01 sec)
INSERT INTO WORKTAB8(ID, NAME) VALUES(1, 'AMAN');
Query OK, 1 row affected (0.00 sec)
```

- We don’t get error because AMAN, NULL and again AMAN, NULL is not considered as combination.
- The reason you're not seeing an error when inserting a record with a value and NULL in the same columns is because NULL is considered a distinct value. Therefore, a combination of ('John', NULL) and ('John', NULL) is considered unique according to the rules of MySQL

```
INSERT INTO TAB8(ID, NAME, AGE) VALUES(2, 'RAMU', 22);
INSERT INTO TAB8(ID, NAME, AGE) VALUES(2, 'RAMU', 23);
INSERT INTO TAB8(ID, NAME, AGE) VALUES(2, 'AMU', 23);
INSERT INTO TAB8(ID, NAME, AGE) VALUES(2, 'RAMU',
22);//ERROR
INSERT INTO TAB8(NAME, AGE) VALUES('RAMU', 22);//ERROR
INSERT INTO TAB8(NAME, AGE) VALUES('RAMU', 22);//ERROR
INSERT INTO TAB8(ID, AGE) VALUES(5, 22); //ERROR
INSERT INTO TAB8(ID, AGE) VALUES(5, 22); //ERROR
INSERT INTO TAB8(ID) VALUES(5);
INSERT INTO TAB8(ID) VALUES(5);
INSERT INTO TAB8(ID) VALUES(5);
INSERT INTO TAB8(ID) VALUES(5);
```

- The above queries possible because under UNIQUE constraint any number of NULL values and that won’t be considered as a combination.

```
INSERT INTO TAB8(AGE) VALUES(25);

SELECT * FROM TAB8;


DROP TABLE IF EXISTS WORKTAB9;

Query OK, 0 rows affected, 1 warning (0.05 sec)


CREATE TABLE WORKTAB9(ID INTEGER, NAME VARCHAR(90) PRIMARY
KEY, AGE INTEGER);

Query OK, 0 rows affected (0.07 sec)
```

- PRIMARY KEY is a combination of NOT NULL and UNIQUE.
- If any column is declared as PRIMARY KEY then that column value should not be NULL value and should not contain duplicate value.

```
INSERT INTO WORKTAB9(ID, NAME) VALUES(1, 'MANOHAR');

Query OK, 1 row affected (0.01 sec)


INSERT INTO WORKTAB9(ID, NAME) VALUES(1, 'MANOHAR');

ERROR 1062 (23000): Duplicate entry 'MANOHAR' for key
'worktab9.PRIMARY'


INSERT INTO WORKTAB9(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

Query OK, 1 row affected (0.01 sec)


INSERT INTO WORKTAB9(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

ERROR 1062 (23000): Duplicate entry 'AMAN' for key
'worktab9.PRIMARY'

INSERT INTO WORKTAB9(ID, AGE) VALUES(5, 22);
```

```
ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value

INSERT INTO WORKTAB9(ID) VALUES(5);

ERROR 1364 (HY000): Field 'NAME' doesn't have a default
value

INSERT INTO WORKTAB9(NAME) VALUES('VIJAY');

Query OK, 1 row affected (0.01 sec)


INSERT INTO WORKTAB9(NAME) VALUES('VIJAY');

ERROR 1062 (23000): Duplicate entry 'VIJAY' for key
'worktab9.PRIMARY'

SELECT * FROM WORKTAB9;

+------+-----------+------+

| ID   | NAME      | AGE  |

+------+-----------+------+

|    2 | AMAN      |   22 |

| NULL | EHSTESHAM |   22 |

|    1 | MANOHAR   | NULL |

| NULL | VIJAY     | NULL |

+------+-----------+------+

4 rows in set (0.00 sec)
```

```
CREATE TABLE WORKTAB10(ID INTEGER, NAME VARCHAR(90) PRIMARY KEY, AGE INTEGER PRIMARY KEY);

ERROR 1068 (42000): Multiple primary key defined
```

- In a table there should be only one column declared as PRIMARY KEY not more than one column.

```
CREATE TABLE WORKTAB11(ID INTEGER, NAME VARCHAR(90), AGE INTEGER, CONSTRAINT WORKTAB11_PK1 PRIMARY KEY(AGE));

Query OK, 0 rows affected (0.04 sec)


INSERT INTO WORKTAB11(ID, NAME) VALUES(1, 'MANOHAR');

ERROR 1364 (HY000): Field 'AGE' doesn't have a default value


INSERT INTO WORKTAB11(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

Query OK, 1 row affected (0.00 sec)


INSERT INTO WORKTAB11(ID, NAME, AGE) VALUES(2, 'AMAN', 22);

ERROR 1062 (23000): Duplicate entry '22' for key 'worktab11.PRIMARY'

INSERT INTO WORKTAB11(NAME, AGE) VALUES('AMAN', 22);

ERROR 1062 (23000): Duplicate entry '22' for key 'worktab11.PRIMARY'

INSERT INTO WORKTAB11(NAME, AGE) VALUES('AMAN', 28);

Query OK, 1 row affected (0.00 sec)

INSERT INTO WORKTAB11(ID, AGE) VALUES(5, 28);

ERROR 1062 (23000): Duplicate entry '28' for key 'worktab11.PRIMARY'

INSERT INTO WORKTAB11(ID) VALUES(5);
```

```
ERROR 1364 (HY000): Field 'AGE' doesn't have a default
value

INSERT INTO WORKTAB11(AGE) VALUES(25);

Query OK, 1 row affected (0.00 sec)

INSERT INTO WORKTAB11(NAME) VALUES('VIJAY');

ERROR 1364 (HY000): Field 'AGE' doesn't have a default
value

SELECT * FROM WORKTAB11;

+------+------+-----+

| ID   | NAME | AGE |

+------+------+-----+

|    2 | AMAN |  22 |

| NULL | NULL |  25 |

| NULL | AMAN |  28 |

+------+------+-----+
```

```
CREATE TABLE WORKTAB12(ID INTEGER, NAME VARCHAR(90), AGE
INTEGER, CONSTRAINT WORKTAB12_PK1 PRIMARY KEY(AGE, NAME));
```

- Composite PRIMARY key is possible.

```
INSERT INTO WORKTAB12 VALUES(1, 'AMAN', 22);

Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB12 VALUES(2, 'AMAN', 22);

ERROR 1062 (23000): Duplicate entry '22-AMAN' for key
'worktab12.PRIMARY'

INSERT INTO WORKTAB12 VALUES(3, 'AMAN', 23);

Query OK, 1 row affected (0.01 sec)

INSERT INTO WORKTAB12 VALUES(4, 'MANOHAR', 23);

Query OK, 1 row affected (0.00 sec)
```

```
INSERT INTO WORKTAB12(ID, NAME) VALUES(5, 'JAGAN');
ERROR 1364 (HY000): Field 'AGE' doesn't have a default value
INSERT INTO WORKTAB12(ID, AGE) VALUES(6, 25);
ERROR 1364 (HY000): Field 'NAME' doesn't have a default value
```

FOREIGN KEY

```
CREATE TABLE FS_STUDENT(ID INTEGER UNIQUE, FIRST_NAME VARCHAR(90), LAST_NAME VARCHAR(90), AGE INTEGER, EMAIL VARCHAR(90));
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE FS_STUDENT_ADDRESS(HOUSE_NO VARCHAR(90), STREET_NAME VARCHAR(90), CITY VARCHAR(90), STATE VARCHAR(90), FS_STUDENT_ID INTEGER, CONSTRAINT FS_STUDENT_ADDRESS_FK1 FOREIGN KEY(FS_STUDENT_ID) REFERENCES FS_STUDENT(ID));
Query OK, 0 rows affected (0.03 sec)
```

- For FOREIGN KEY purpose REFERENCES table column either UNIQUE or PRIMARY

```
INSERT INTO FS_STUDENT VALUES(1, 'AMAN', 'GUPTA', 22,
'AMAN@VP.COM');

Query OK, 1 row affected (0.01 sec)


INSERT INTO FS_STUDENT_ADDRESS VALUES('123/A', 'BTM',
'BLR', 'KAR', 1);

Query OK, 1 row affected (0.01 sec)


INSERT INTO FS_STUDENT VALUES(2, 'MANOHAR', 'VERMA', 24,
'MANOHAR@VP.COM');

Query OK, 1 row affected (0.01 sec)


INSERT INTO FS_STUDENT_ADDRESS VALUES('256/B', 'BSK',
'BLR', 'KAR', 2);

Query OK, 1 row affected (0.00 sec)


INSERT INTO FS_STUDENT VALUES(3, 'VIJAY', 'KUMAR', 26,
'VIJAY@VP.COM');

Query OK, 1 row affected (0.00 sec)


INSERT INTO FS_STUDENT_ADDRESS VALUES('126/C', 'JPN',
'BLR', 'KAR', 3);

Query OK, 1 row affected (0.01 sec)
```

```
INSERT INTO FS_STUDENT_ADDRESS VALUES('450/D', 'KKC',
'BLR', 'KAR', 5);
```

```
ERROR 1452 (23000): Cannot add or update a child row: a
foreign key constraint fails
(`mysql_notes`.`fs_student_address`, CONSTRAINT
`FS_STUDENT_ADDRESS_FK1` FOREIGN KEY (`FS_STUDENT_ID`)
REFERENCES `fs_student` (`ID`))
```

- Trying to insert child record straight away without parent.
- FOREIGN KEY should have reference value of the column from the parent.

```
INSERT INTO FS_STUDENT VALUES(4, 'JAGAN', 'REDDY', 27,
'JAGAN@VP.COM');
```

```
Query OK, 1 row affected (0.01 sec)
```

```
INSERT INTO FS_STUDENT_ADDRESS VALUES('450/D', 'KKC',
'BLR', 'KAR', 4);
```

```
Query OK, 1 row affected (0.01 sec)
```

```
DELETE FROM FS_STUDENT WHERE ID = 4;
```

```
ERROR 1451 (23000): Cannot delete or update a parent row: a
foreign key constraint fails
(`mysql_notes`.`fs_student_address`, CONSTRAINT
`FS_STUDENT_ADDRESS_FK1` FOREIGN KEY (`FS_STUDENT_ID`)
REFERENCES `fs_student` (`ID`))
```

- FS_STUDENT ID = 4 having child in the FS_STUDENT_ADDRESS.
- You can’t delete parent record without deleting a child record.

```
DELETE FROM FS_STUDENT_ADDRESS WHERE FS_STUDENT_ID = 4;
Query OK, 1 row affected (0.01 sec)

DELETE FROM FS_STUDENT WHERE ID = 4;
Query OK, 1 row affected (0.01 sec)

DROP TABLE FS_STUDENT;
ERROR 3730 (HY000): Cannot drop table 'fs_student'
referenced by a foreign key constraint
'FS_STUDENT_ADDRESS_FK1' on table 'fs_student_address'.
DROP TABLE FS_STUDENT_ADDRESS;
Query OK, 0 rows affected (0.02 sec)

DROP TABLE FS_STUDENT;
Query OK, 0 rows affected (0.01 sec)
```

- Straight away we cant delete STUDENT table.
- STUDENT table is a parent to ADDRESS table
- Without deleting the child we cant able to delete PARENT
- Even though ADDRESS table is empty we cant able to drop STUDENT table.
- First we need to drop ADDRESS table then only we can able to drop the STUDENT table.

```
CREATE TABLE FS_STUDENT(ID INTEGER, FIRST_NAME VARCHAR(90),
LAST_NAME VARCHAR(90), AGE INTEGER, EMAIL VARCHAR(90));
```

```
Query OK, 0 rows affected (0.03 sec)
```

```
CREATE TABLE FS_STUDENT_ADDRESS(HOUSE_NO VARCHAR(90),
STREET_NAME VARCHAR(90), CITY VARCHAR(90), STATE
VARCHAR(90), FS_STUDENT_ID INTEGER, CONSTRAINT
FS_STUDENT_ADDRESS_FK1 FOREIGN KEY(FS_STUDENT_ID)
REFERENCES FS_STUDENT(ID));
```

```
ERROR 1822 (HY000): Failed to add the foreign key
constraint. Missing index for constraint
'FS_STUDENT_ADDRESS_FK1' in the referenced table
'fs_student'
```

```
DROP TABLE FS_STUDENT;
```

```
CREATE TABLE FS_STUDENT(ID INTEGER UNIQUE, FIRST_NAME
VARCHAR(90), LAST_NAME VARCHAR(90), AGE INTEGER, EMAIL
VARCHAR(90));
```

```
Query OK, 0 rows affected (0.04 sec)
```

```
CREATE TABLE FS_STUDENT_ADDRESS(HOUSE_NO VARCHAR(90),
STREET_NAME VARCHAR(90), CITY VARCHAR(90), STATE
VARCHAR(90), FS_STUDENT_ID INTEGER, CONSTRAINT
FS_STUDENT_ADDRESS_FK1 FOREIGN KEY(FS_STUDENT_ID)
REFERENCES FS_STUDENT(ID));
```

```
INSERT INTO FS_STUDENT VALUES(1, 'AMAN', 'GUPTA', 22, 'AMAN@GMAIL.COM');
```

```
Query OK, 1 row affected (0.01 sec)
```

```
INSERT INTO FS_STUDENT_ADDRESS(HOUSE_NO, STREET_NAME, CITY, STATE) VALUES('140/F', 'RRN', 'BLR', 'KAR');
```

```
Query OK, 1 row affected (0.01 sec)
```

- we can have NULL values for FOREIGN KEY REFERENCE.
- If FS_STUDENT_ID is not PRIMARY KEY in the ADDRESS we can have NULL values.
- We are inserting an ADDRESS which doesn’t belong to any STUDENT.
- By default FOREIGN KEY allows NULL values.

```
UPDATE FS_STUDENT_ADDRESS SET FS_STUDENT_ID = 3 WHERE HOUSE_NO = '140/F';
```

```
ERROR 1452 (23000): Cannot add or update a child row: a foreign key constraint fails (`mysql_notes`.`fs_student_address`, CONSTRAINT `FS_STUDENT_ADDRESS_FK1` FOREIGN KEY (`FS_STUDENT_ID`) REFERENCES `fs_student` (`ID`))
```

- There is no corresponding record.

```
UPDATE FS_STUDENT_ADDRESS SET FS_STUDENT_ID = 1 WHERE HOUSE_NO = '140/F';
```

```
Query OK, 1 row affected (0.01 sec)
```

```
Rows matched: 1  Changed: 1  Warnings: 0
```

```
INSERT INTO FS_STUDENT(FIRST_NAME, LAST_NAME, AGE, EMAIL)
VALUES('MANOHAR', 'VERMA', 22, 'MANOHAR@GMAIL.COM');
```

Query OK, 1 row affected (0.03 sec)

```
INSERT INTO FS_STUDENT_ADDRESS(HOUSE_NO, STREET_NAME, CITY,
STATE) VALUES('224/Y', 'RGN', 'BLR', 'KAR');
```

Query OK, 1 row affected (0.01 sec)

- In the base table ID column is NULL and in the child table FS_STUDENT_ID is also NULL.
- In the parent table there is a record with no ID.
- In the child table there is record which doesn’t match to any of the parent table records.
- NULL cant be assigned to another NULL.
- NULL cant be mapped to another NULL.

```
UPDATE FS_STUDENT SET ID = 2 WHERE FIRST_NAME ='MANOHAR';
```

Query OK, 1 row affected (0.01 sec)

Rows matched: 1 Changed: 1 Warnings: 0

```
UPDATE FS_STUDENT_ADDRESS SET FS_STUDENT_ID = 2 WHERE
HOUSE_NO = '224/Y';
```

Query OK, 1 row affected (0.01 sec)

Rows matched: 1 Changed: 1 Warnings: 0

ONE-TO-ONE

```
DROP TABLE IF EXISTS PERSON;

CREATE TABLE PERSON (ID INTEGER PRIMARY KEY, FIRST_NAME
VARCHAR(90), LAST_NAME VARCHAR(90), AGE INTEGER);
```

- Because of ID column is PRIMARY KEY PERSON table can become a parent to child table.

```
DROP TABLE IF EXISTS ADDRESS;

CREATE TABLE ADDRESS(HOUSE_NO VARCHAR(90), STREET_NAME
VARCHAR(90), CITY VARCHAR(90), STATE VARCHAR(90), PERSON_ID
INTEGER UNIQUE, CONSTRAINT ADDRESS_FK1 FOREIGN
KEY(PERSON_ID) REFERENCES PERSON(ID));


INSERT INTO PERSON VALUES(1, 'AMAN', 'GUPTA', 22);

INSERT INTO PERSON VALUES(2, 'MANOHAR', 'VERMA', 24);

INSERT INTO PERSON VALUES(3, 'SWETHA', 'SHARMA', 21);

INSERT INTO PERSON VALUES(4, 'VIJAY', 'VAISHNAV', 23);

INSERT INTO PERSON VALUES(5, 'KUMAR', 'SINHA', 23);

SELECT * FROM PERSON;

+----+------------+-----------+------+

| ID | FIRST_NAME | LAST_NAME | AGE  |

+----+------------+-----------+------+

|  1 | AMAN       | GUPTA     |   22 |

|  2 | MANOHAR    | VERMA     |   24 |

|  3 | SWETHA     | SHARMA    |   21 |

|  4 | VIJAY      | VAISHNAV  |   23 |

|  5 | KUMAR      | SINHA     |   23 |

+----+------------+-----------+------+
```

```
INSERT INTO ADDRESS VALUES('185/A', 'BSK', 'BLR', 'KAR',
1);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('224/B', 'JPN', 'BLR', 'KAR',
1);
ERROR 1062 (23000): Duplicate entry '1' for key
'address.PERSON_ID'
```

- FOREIGN KEY is a UNIQUE so we can’t insert duplicates.
- One record of PERSON mapping to only one record of ADDRESS. So we call it as one to one mapping.

```
INSERT INTO ADDRESS VALUES('185/A', 'BSK', 'BLR', 'KAR',
1);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('224/B', 'JPN', 'BLR', 'KAR',
1);
ERROR 1062 (23000): Duplicate entry '1' for key
'address.PERSON_ID'
INSERT INTO ADDRESS VALUES('228/C', 'RRN', 'BLR', 'KAR',
2);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('356/D', 'KKC', 'BLR', 'KAR',
3);
Query OK, 1 row affected (0.00 sec)
```

```
INSERT INTO ADDRESS VALUES('521/F', 'RJN', 'BLR', 'KAR',
4);
Query OK, 1 row affected (0.01 sec)


INSERT INTO ADDRESS VALUES('652/G', 'KRL', 'BLR', 'KAR',
6);
ERROR 1452 (23000): Cannot add or update a child row: a
foreign key constraint fails (`mysql_notes`.`address`,
CONSTRAINT `ADDRESS_FK1` FOREIGN KEY (`PERSON_ID`)
REFERENCES `person` (`ID`))
```

- No PERSON with ID as 6

```
INSERT INTO ADDRESS(HOUSE_NO, STREET_NAME, CITY, STATE)
VALUES('224/I', 'BTM', 'BLR', 'KAR');
```

- We can insert ADDRESS without choosing PERSON_ID because this column is UNIQUE and allows NULL values.

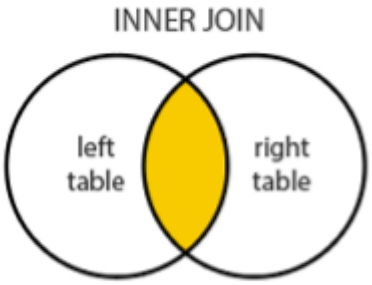
```
SELECT * FROM PERSON;
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
|  2 | MANOHAR    | VERMA     |   24 |
|  3 | SWETHA     | SHARMA    |   21 |
|  4 | VIJAY      | VAISHNAV  |   23 |
|  5 | KUMAR      | SINHA     |   23 |
+----+------------+-----------+------+
5 rows in set (0.00 sec)
```

```
SELECT * FROM ADDRESS;
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 185/A    | BSK         | BLR  | KAR   |         1 |
| 228/C    | RRN         | BLR  | KAR   |         2 |
| 356/D    | KKC         | BLR  | KAR   |         3 |
| 521/F    | RJN         | BLR  | KAR   |         4 |
| 224/I    | BTM         | BLR  | KAR   |      NULL |
+----------+-------------+------+-------+-----------+

SELECT * FROM PERSON WHERE FIRST_NAME = 'AMAN';
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
+----+------------+-----------+------+

SELECT * FROM ADDRESS WHERE HOUSE_NO = '185/A';
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 185/A    | BSK         | BLR  | KAR   |         1 |
+----------+-------------+------+-------+-----------+
```

```
SELECT * FROM ADDRESS WHERE PERSON_ID = 3;
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 356/D    | KKC         | BLR  | KAR   |         3 |
+----------+-------------+------+-------+-----------+

SELECT * FROM ADDRESS WHERE PERSON_ID = (SELECT ID FROM
PERSON WHERE FIRST_NAME = 'AMAN');
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 185/A    | BSK         | BLR  | KAR   |         1 |
+----------+-------------+------+-------+-----------+

SELECT * FROM PERSON WHERE ID = (SELECT PERSON_ID FROM
ADDRESS WHERE HOUSE_NO = '185/A');
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
+----+------------+-----------+------+
```

INNER JOIN

- The default join is inner join, if you are not specifying any keywords.



SELECT * FROM PERSON, ADDRESS WHERE PERSON.ID = ADDRESS.PERSON_ID;

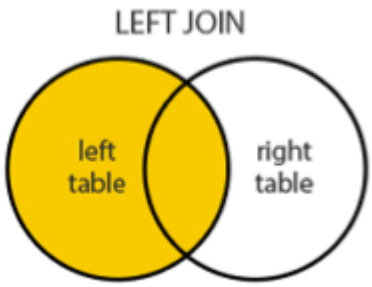
ID	FIRST_NAME	LAST_NAME	AGE	HOUSE_NO	STREET_NAME	CITY	STATE	PERSON_ID
1	AMAN	GUPTA	22	185/A	BSK	BLR	KAR	1
2	MANOHAR	VERMA	24	228/C	RRN	BLR	KAR	2
3	SWETHA	SHARMA	21	356/D	KKC	BLR	KAR	3
4	VIJAY	VAISHNAV	23	521/F	RJN	BLR	KAR	4

SELECT * FROM PERSON P, ADDRESS A WHERE P.ID = A.PERSON_ID;

```
SELECT * FROM PERSON P INNER JOIN ADDRESS A ON P.ID = A.PERSON_ID;
```

ID	FIRST_NAME	LAST_NAME	AGE	HOUSE_NO	STREET_NAME	CITY	STATE	PERSON_ID
1	AMAN	GUPTA	22	185/A	BSK	BLR	KAR	1
2	MANOHAR	VERMA	24	228/C	RRN	BLR	KAR	2
3	SWETHA	SHARMA	21	356/D	KKC	BLR	KAR	3
4	VIJAY	VAISHNAV	23	521/F	RJN	BLR	KAR	4

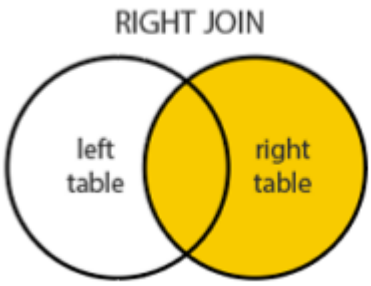
LEFT OUTER JOIN



SELECT * FROM PERSON P LEFT OUTER JOIN ADDRESS A ON P.ID = A.PERSON_ID;

ID	FIRST_NAME	LAST_NAME	AGE	HOUSE_NO	STREET_NAME	CITY	STATE	PERSON_ID
1	AMAN	GUPTA	22	185/A	BSK	BLR	KAR	1
2	MANOHAR	VERMA	24	228/C	RRN	BLR	KAR	2
3	SWETHA	SHARMA	21	356/D	KKC	BLR	KAR	3
4	VIJAY	VAISHNAV	23	521/F	RJN	BLR	KAR	4
5	KUMAR	SINHA	23	NULL	NULL	NULL	NULL	NULL

RIGHT OUTER JOIN



SELECT * FROM PERSON P RIGHT OUTER JOIN ADDRESS A ON P.ID = A.PERSON_ID;

SELECT * FROM PERSON P RIGHT OUTER JOIN ADDRESS A ON P.ID = A.PERSON_ID;

```
+------+------------+-----------+------+----------+-------------+------+-------+-----------+
| ID   | FIRST_NAME | LAST_NAME | AGE  | HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+------+------------+-----------+------+----------+-------------+------+-------+-----------+
|    1 | AMAN       | GUPTA     |   22 | 185/A    | BSK         | BLR  | KAR   |         1 |
|    2 | MANOHAR    | VERMA     |   24 | 228/C    | RRN         | BLR  | KAR   |         2 |
|    3 | SWETHA     | SHARMA    |   21 | 356/D    | KKC         | BLR  | KAR   |         3 |
|    4 | VIJAY      | VAISHNAV  |   23 | 521/F    | RJN         | BLR  | KAR   |         4 |
| NULL | NULL       | NULL      | NULL | 224/I    | BTM         | BLR  | KAR   |      NULL |
+------+------------+-----------+------+----------+-------------+------+-------+-----------+
```

FULL OUTER JOIN

- Unfortunately we don’t have full outer join in mysql database but this feature is available on oracle database.

SELECT * FROM PERSON P FULL OUTER JOIN ADDRESS A ON P.ID = A.PERSON_ID;

ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near 'FULL OUTER JOIN ADDRESS A ON P.ID = A.PERSON_ID' at line 1

ONE-TO-MANY MAPPING

```
DROP TABLE IF EXISTS PERSON, ADDRESS;

CREATE TABLE PERSON (ID INTEGER PRIMARY KEY, FIRST_NAME
VARCHAR(90), LAST_NAME VARCHAR(90), AGE INTEGER);

DROP IF EXISTS TABLE MAIL_ACCOUNT;
CREATE TABLE EMAIL_ID(USERNAME VARCHAR(90), PASSWORD
VARCHAR(90), VENDOR VARCHAR(90), PERSON_ID INTEGER,
CONSTRAINT MA_FK1 FOREIGN KEY(PERSON_ID) REFERENCES
PERSON(ID));

INSERT INTO PERSON VALUES(1, 'AMAN', 'GUPTA', 22);
INSERT INTO PERSON VALUES(2, 'MANOHAR', 'VERMA', 24);
INSERT INTO PERSON VALUES(3, 'SWETHA', 'SHARMA', 21);
INSERT INTO PERSON VALUES(4, 'VIJAY', 'VAISHNAV', 23);
INSERT INTO PERSON VALUES(5, 'KUMAR', 'SINHA', 23);

INSERT INTO EMAIL_ID VALUES('AMAN', 'PASS', 'GMAIL', 1);
INSERT INTO EMAIL_ID VALUES('AMAN', 'PASS', 'OUTLOOK', 1);
INSERT INTO EMAIL_ID VALUES('AMAN', 'PASS', 'HOTMAIL', 1);
INSERT INTO EMAIL_ID VALUES('MANOHAR', 'PASS', 'YAHOO', 2);
INSERT INTO EMAIL_ID VALUES('MANOHAR', 'PASS', 'GMAIL', 2);
INSERT INTO EMAIL_ID VALUES('SWETHA', 'PASS', 'GMAIL', 3);
INSERT INTO EMAIL_ID VALUES('KUMAR', 'PASS', 'GMAIL', 4);
INSERT INTO EMAIL_ID (USERNAME, PASSWORD, VENDOR)
VALUES('VIJAY', 'PASS', 'GMAIL');
```

```
SELECT * FROM PERSON;
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
|  2 | MANOHAR    | VERMA     |   24 |
|  3 | SWETHA     | SHARMA    |   21 |
|  4 | VIJAY      | VAISHNAV  |   23 |
|  5 | KUMAR      | SINHA     |   23 |
+----+------------+-----------+------+

SELECT * FROM EMAIL_ID;
+----------+----------+---------+-----------+
| USERNAME | PASSWORD | VENDOR  | PERSON_ID |
+----------+----------+---------+-----------+
| AMAN     | PASS     | GMAIL   |         1 |
| AMAN     | PASS     | OUTLOOK |         1 |
| AMAN     | PASS     | HOTMAIL |         1 |
| MANOHAR  | PASS     | YAHOO   |         2 |
| MANOHAR  | PASS     | GMAIL   |         2 |
| SWETHA   | PASS     | GMAIL   |         3 |
| KUMAR    | PASS     | GMAIL   |         4 |
| VIJAY    | PASS     | GMAIL   |      NULL |
+----------+----------+---------+-----------+
```

```
SELECT * FROM PERSON WHERE FIRST_NAME = 'AMAN';
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
+----+------------+-----------+------+

SELECT * FROM EMAIL_ID WHERE USERNAME = 'AMAN';
+----------+----------+---------+-----------+
| USERNAME | PASSWORD | VENDOR  | PERSON_ID |
+----------+----------+---------+-----------+
| AMAN     | PASS     | GMAIL   |         1 |
| AMAN     | PASS     | OUTLOOK |         1 |
| AMAN     | PASS     | HOTMAIL |         1 |
+----------+----------+---------+-----------+

SELECT * FROM EMAIL_ID WHERE PERSON_ID = 3;
+----------+----------+--------+-----------+
| USERNAME | PASSWORD | VENDOR | PERSON_ID |
+----------+----------+--------+-----------+
| SWETHA   | PASS     | GMAIL  |         3 |
+----------+----------+--------+-----------+
```

```
SELECT * FROM EMAIL_ID WHERE PERSON_ID = (SELECT ID FROM
PERSON WHERE FIRST_NAME = 'AMAN');
+----------+----------+---------+-----------+
| USERNAME | PASSWORD | VENDOR  | PERSON_ID |
+----------+----------+---------+-----------+
| AMAN     | PASS     | GMAIL   |         1 |
| AMAN     | PASS     | OUTLOOK |         1 |
| AMAN     | PASS     | HOTMAIL |         1 |
+----------+----------+---------+-----------+
```

```
SELECT * FROM PERSON WHERE ID = (SELECT PERSON_ID FROM
EMAIL_ID WHERE USERNAME = 'AMAN');
ERROR 1242 (21000): Subquery returns more than 1 row
```

```
SELECT * FROM PERSON, EMAIL_ID WHERE PERSON.ID =
EMAIL_ID.PERSON_ID;
+----+------------+-----------+------+----------+----------+---------+-----------+
| ID | FIRST_NAME | LAST_NAME | AGE  | USERNAME | PASSWORD | VENDOR  | PERSON_ID |
+----+------------+-----------+------+----------+----------+---------+-----------+
|  1 | AMAN       | GUPTA     |   22 | AMAN     | PASS     | GMAIL   |         1 |
|  1 | AMAN       | GUPTA     |   22 | AMAN     | PASS     | OUTLOOK |         1 |
|  1 | AMAN       | GUPTA     |   22 | AMAN     | PASS     | HOTMAIL |         1 |
|  2 | MANOHAR    | VERMA     |   24 | MANOHAR  | PASS     | YAHOO   |         2 |
|  2 | MANOHAR    | VERMA     |   24 | MANOHAR  | PASS     | GMAIL   |         2 |
|  3 | SWETHA     | SHARMA    |   21 | SWETHA   | PASS     | GMAIL   |         3 |
|  4 | VIJAY      | VAISHNAV  |   23 | KUMAR    | PASS     | GMAIL   |         4 |
+----+------------+-----------+------+----------+----------+---------+-----------+
```

```
SELECT * FROM PERSON P, EMAIL_ID M WHERE P.ID =
M.PERSON_ID;


SELECT * FROM PERSON P INNER JOIN EMAIL_ID M ON P.ID =
M.PERSON_ID;


SELECT * FROM PERSON P LEFT OUTER JOIN EMAIL_ID M ON P.ID =
M.PERSON_ID;
```

ID	FIRST_NAME	LAST_NAME	AGE	USERNAME	PASSWORD	VENDOR	PERSON_ID
1	AMAN	GUPTA	22	AMAN	PASS	GMAIL	1
1	AMAN	GUPTA	22	AMAN	PASS	OUTLOOK	1
1	AMAN	GUPTA	22	AMAN	PASS	HOTMAIL	1
2	MANOHAR	VERMA	24	MANOHAR	PASS	YAHOO	2
2	MANOHAR	VERMA	24	MANOHAR	PASS	GMAIL	2
3	SWETHA	SHARMA	21	SWETHA	PASS	GMAIL	3
4	VIJAY	VAISHNAV	23	KUMAR	PASS	GMAIL	4
5	KUMAR	SINHA	23	NULL	NULL	NULL	NULL

```
SELECT * FROM PERSON P RIGHT OUTER JOIN EMAIL_ID M ON P.ID
= M.PERSON_ID;
```

ID	FIRST_NAME	LAST_NAME	AGE	USERNAME	PASSWORD	VENDOR	PERSON_ID
1	AMAN	GUPTA	22	AMAN	PASS	GMAIL	1
1	AMAN	GUPTA	22	AMAN	PASS	OUTLOOK	1
1	AMAN	GUPTA	22	AMAN	PASS	HOTMAIL	1
2	MANOHAR	VERMA	24	MANOHAR	PASS	YAHOO	2
2	MANOHAR	VERMA	24	MANOHAR	PASS	GMAIL	2
3	SWETHA	SHARMA	21	SWETHA	PASS	GMAIL	3
4	VIJAY	VAISHNAV	23	KUMAR	PASS	GMAIL	4
NULL	NULL	NULL	NULL	VIJAY	PASS	GMAIL	NULL

ONE-TO-ONE

```
DROP TABLE IF EXISTS PERSON;

CREATE TABLE PERSON (ID INTEGER PRIMARY KEY, FIRST_NAME
VARCHAR(90), LAST_NAME VARCHAR(90), AGE INTEGER);
```

- Because of ID column is PRIMARY KEY PERSON table can become a parent to child table.

```
DROP TABLE IF EXISTS ADDRESS;

CREATE TABLE ADDRESS(HOUSE_NO VARCHAR(90), STREET_NAME
VARCHAR(90), CITY VARCHAR(90), STATE VARCHAR(90), PERSON_ID
INTEGER UNIQUE, CONSTRAINT ADDRESS_FK1 FOREIGN
KEY(PERSON_ID) REFERENCES PERSON(ID));
```

```
INSERT INTO PERSON VALUES(1, 'AMAN', 'GUPTA', 22);
INSERT INTO PERSON VALUES(2, 'MANOHAR', 'VERMA', 24);
INSERT INTO PERSON VALUES(3, 'SWETHA', 'SHARMA', 21);
INSERT INTO PERSON VALUES(4, 'VIJAY', 'VAISHNAV', 23);
INSERT INTO PERSON VALUES(5, 'KUMAR', 'SINHA', 23);

SELECT * FROM PERSON;
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
|  2 | MANOHAR    | VERMA     |   24 |
|  3 | SWETHA     | SHARMA    |   21 |
|  4 | VIJAY      | VAISHNAV  |   23 |
|  5 | KUMAR      | SINHA     |   23 |
+----+------------+-----------+------+

INSERT INTO ADDRESS VALUES('185/A', 'BSK', 'BLR', 'KAR',
1);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('224/B', 'JPN', 'BLR', 'KAR',
1);
ERROR 1062 (23000): Duplicate entry '1' for key
'address.PERSON_ID'
```

- FOREIGN KEY is a UNIQUE so we can’t insert duplicates.
- One record of PERSON mapping to only one record of ADDRESS. So we call it as one to one mapping.

```
INSERT INTO ADDRESS VALUES('185/A', 'BSK', 'BLR', 'KAR',
1);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('224/B', 'JPN', 'BLR', 'KAR',
1);
ERROR 1062 (23000): Duplicate entry '1' for key
'address.PERSON_ID'
INSERT INTO ADDRESS VALUES('228/C', 'RRN', 'BLR', 'KAR',
2);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('356/D', 'KKC', 'BLR', 'KAR',
3);
Query OK, 1 row affected (0.00 sec)

INSERT INTO ADDRESS VALUES('521/F', 'RJN', 'BLR', 'KAR',
4);
Query OK, 1 row affected (0.01 sec)

INSERT INTO ADDRESS VALUES('652/G', 'KRL', 'BLR', 'KAR',
6);
ERROR 1452 (23000): Cannot add or update a child row: a
foreign key constraint fails (`mysql_notes`.`address`,
CONSTRAINT `ADDRESS_FK1` FOREIGN KEY (`PERSON_ID`)
REFERENCES `person` (`ID`))
```

- No PERSON with ID as 6

```
INSERT INTO ADDRESS(HOUSE_NO, STREET_NAME, CITY, STATE)
VALUES('224/I', 'BTM', 'BLR', 'KAR');
```

- **We can insert ADDRESS without choosing PERSON_ID because this column is UNIQUE and allows NULL values.**

```
SELECT * FROM PERSON;
SELECT * FROM ADDRESS;
```

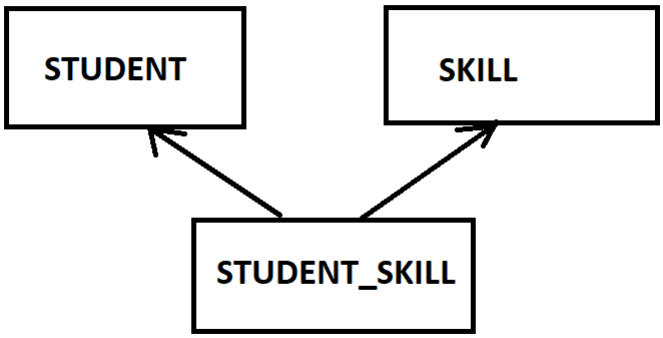
```
SELECT * FROM PERSON;
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
|  2 | MANOHAR    | VERMA     |   24 |
|  3 | SWETHA     | SHARMA    |   21 |
|  4 | VIJAY      | VAISHNAV  |   23 |
|  5 | KUMAR      | SINHA     |   23 |
+----+------------+-----------+------+
5 rows in set (0.00 sec)
```

```
SELECT * FROM ADDRESS;
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 185/A    | BSK         | BLR  | KAR   |         1 |
| 228/C    | RRN         | BLR  | KAR   |         2 |
| 356/D    | KKC         | BLR  | KAR   |         3 |
| 521/F    | RJN         | BLR  | KAR   |         4 |
| 224/I    | BTM         | BLR  | KAR   |      NULL |
+----------+-------------+------+-------+-----------+

SELECT * FROM PERSON WHERE FIRST_NAME = 'AMAN';
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
+----+------------+-----------+------+

SELECT * FROM ADDRESS WHERE HOUSE_NO = '185/A';
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 185/A    | BSK         | BLR  | KAR   |         1 |
+----------+-------------+------+-------+-----------+
```

```
SELECT * FROM ADDRESS WHERE PERSON_ID = 3;
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 356/D    | KKC         | BLR  | KAR   |         3 |
+----------+-------------+------+-------+-----------+

SELECT * FROM ADDRESS WHERE PERSON_ID = (SELECT ID FROM
PERSON WHERE FIRST_NAME = 'AMAN');
+----------+-------------+------+-------+-----------+
| HOUSE_NO | STREET_NAME | CITY | STATE | PERSON_ID |
+----------+-------------+------+-------+-----------+
| 185/A    | BSK         | BLR  | KAR   |         1 |
+----------+-------------+------+-------+-----------+

SELECT * FROM PERSON WHERE ID = (SELECT PERSON_ID FROM
ADDRESS WHERE HOUSE_NO = '185/A');
+----+------------+-----------+------+
| ID | FIRST_NAME | LAST_NAME | AGE  |
+----+------------+-----------+------+
|  1 | AMAN       | GUPTA     |   22 |
+----+------------+-----------+------+
```

MANY-TO-MANY MAPPING

```
DROP TABLE IF EXISTS STUDENT;

CREATE TABLE STUDENT(ID INTEGER UNIQUE, FIRST_NAME
VARCHAR(90), LAST_NAME VARCHAR(90));


DROP TABLE IF EXISTS SKILL;

CREATE TABLE SKILL(ID INTEGER UNIQUE, NAME VARCHAR(90));


INSERT INTO STUDENT VALUES(1, 'AMAN', 'GUPTA');

INSERT INTO STUDENT VALUES(2, 'MANOHAR', 'VERMA');

INSERT INTO STUDENT VALUES(3, 'JAGAN', 'REDDY');

INSERT INTO STUDENT VALUES(4, 'KUMAR', 'SINHA');



INSERT INTO SKILL VALUES(1, 'C');

INSERT INTO SKILL VALUES(2, 'C++');

INSERT INTO SKILL VALUES(3, 'JAVA');

INSERT INTO SKILL VALUES(4, 'SQL');


DROP TABLE IF EXTISTS STUDENT_SKILL;


CREATE TABLE STUDENT_SKILL(STUDENT_ID INTEGER, SKILL_ID
INTEGER, CONSTRAINT SS_FK1 FOREIGN KEY(STUDENT_ID)
REFERENCES STUDENT(ID), CONSTRAINT SS_FK2 FOREIGN
KEY(SKILL_ID) REFERENCES SKILL(ID));
```




```
INSERT INTO STUDENT_SKILL VALUES(1, 1);
INSERT INTO STUDENT_SKILL VALUES(1, 2);
INSERT INTO STUDENT_SKILL VALUES(2, 2);
INSERT INTO STUDENT_SKILL VALUES(3, 1);
INSERT INTO STUDENT_SKILL VALUES(3, 4);

SELECT * FROM STUDENT;
+------+------------+-----------+
| ID   | FIRST_NAME | LAST_NAME |
+------+------------+-----------+
|    1 | AMAN       | GUPTA     |
|    2 | MANOHAR    | VERMA     |
|    3 | JAGAN      | REDDY     |
|    4 | KUMAR      | SINHA     |
+------+------------+-----------+
4 rows in set (0.00 sec)
```

```
SELECT * FROM SKILL;
+------+------+
| ID   | NAME |
+------+------+
|    1 | C    |
|    2 | C++  |
|    3 | JAVA |
|    4 | SQL  |
+------+------+
4 rows in set (0.00 sec)

SELECT * FROM STUDENT_SKILL;
+------------+----------+
| STUDENT_ID | SKILL_ID |
+------------+----------+
|          1 |        1 |
|          1 |        2 |
|          2 |        2 |
|          3 |        1 |
|          3 |        4 |
+------------+----------+

SELECT NAME FROM SKILL WHERE ID IN
(SELECT SKILL_ID FROM STUDENT_SKILL WHERE STUDENT_ID =
(SELECT ID FROM STUDENT WHERE FIRST_NAME = 'AMAN'));
```

```
SELECT FIRST_NAME FROM STUDENT WHERE ID IN (SELECT
STUDENT_ID FROM STUDENT_SKILL WHERE SKILL_ID = (SELECT ID
FROM SKILL WHERE NAME = 'C'));
+------------+
| FIRST_NAME |
+------------+
| AMAN       |
| JAGAN      |
+------------+
```

```
SELECT * FROM STUDENT, STUDENT_SKILL, SKILL WHERE
STUDENT.ID = STUDENT_SKILL.STUDENT_ID AND
STUDENT_SKILL.SKILL_ID = SKILL.ID;
```

```
SELECT * FROM STUDENT S INNER JOIN STUDENT_SKILL SS
ON S.ID = SS.STUDENT_ID INNER JOIN SKILL SK ON SS.SKILL_ID
= SK.ID;
```

To generate database diagram in mysql(ER diagram)

Database -> Reverse Engineer -> choose your connection -> login -> hit continue -> select database schema -> hit continue -> continue again -> make sure items are checked -> execute -> again hit continue -> close

----------THE END----------