

MySQL is a very popular open-source relational database management system (RDBMS).

## What is MySQL?

- MySQL is a relational database management system
- MySQL is open-source
- MySQL is free
- MySQL is ideal for both small and large applications
- MySQL is very fast, reliable, scalable, and easy to use
- MySQL is cross-platform
- MySQL is compliant with the ANSI SQL standard
- MySQL was first released in 1995
- MySQL is developed, distributed, and supported by Oracle Corporation
- MySQL is named after co-founder Monty Widenius's daughter: My

---

## Who Uses MySQL?

- Huge websites like Facebook, Twitter, Airbnb, Booking.com, Uber, GitHub, YouTube, etc.
- Content Management Systems like WordPress, Drupal, Joomla!, Contao, etc.
- A very large number of web developers around the world

---

## Show Data On Your Web Site

To build a web site that shows data from a database, you will need:

- 
- An RDBMS database program (like MySQL)
  - A server-side scripting language, like PHP
  - To use SQL to get the data you want
  - To use HTML / CSS to style the page

## The MySQL CREATE TABLE Statement

The **CREATE TABLE** statement is used to create a new table in a database.

### Syntax

```
CREATE TABLE table_name (  
    column1 datatype,  
    column2 datatype,
```

```
    column3 datatype,  
    ....  
);
```

The column parameters specify the names of the columns of the table.

The datatype parameter specifies the type of data the column can hold (e.g. varchar, integer, date, etc.).

```
CREATE TABLE personal (  
    id INT ,  
    name VARCHAR(50) ,  
    birth_date DATE,  
    phone VARCHAR(15),  
    gender VARCHAR(1)  
);
```

```
CREATE TABLE product(  
    pid INT ,  
    pname VARCHAR(50) ,  
    pcompany VARCHAR(50),  
    price INT  
);
```

## The MySQL INSERT INTO Statement

The **INSERT INTO** statement is used to insert new records in a table.

### INSERT INTO Syntax

It is possible to write the **INSERT INTO** statement in two ways:

1. Specify both the column names and the values to be inserted:

```
INSERT INTO table_name (column1, column2, column3, ...)
VALUES (value1, value2, value3, ...);
```

2. If you are adding values for all the columns of the table, you do not need to specify the column names in the SQL query. However, make sure the order of the values is in the same order as the columns in the table. Here, the **INSERT INTO** syntax would be as follows:

```
INSERT INTO table_name
VALUES (value1, value2, value3, ...);
```

## Create Table

```
CREATE TABLE personal (
    id INT ,
    name VARCHAR(50) ,
    birth_date DATE,
    phone VARCHAR(15),
    gender VARCHAR(1)
);
```

## Insert Data in personal table

```
INSERT INTO personal ( id, name, birth_date, phone, gender)
VALUES ( 1,"Ram Kumar", "1990-07-15", "9977664422", "M" );
```

```
INSERT INTO personal ( id, name, birth_date, phone, gender)
VALUES ( 2,"Meera Khan", "1991-02-10", "9988552211", "F" );
```

```
INSERT INTO personal ( id, name, birth_date, phone, gender)
VALUES ( 1,"Anil Kapoor", "1993-10-05", "9484542414", "M" );
```

## PHP MySQL Insert Multiple Records

### Create Table

```
CREATE TABLE personal (  
    id INT ,  
    name VARCHAR(50) ,  
    birth_date DATE,  
    phone VARCHAR(15),  
    gender VARCHAR(1)  
);
```

### Insert Multiple Data in perosnal table

```
INSERT INTO personal ( id, name, birth_date, phone, gender)  
VALUES  
( 3,"Anil Kapoor", "1993-10-05", "9484542414", "M" ),  
( 4,"Juhi Chawla", "1992-03-15", "9477884421", "F" ),  
( 5,"John Abraham", "1992-02-07", "947584421", "M" );
```

### Create Table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

### Test NOT NULL by skip gender column value

```
INSERT INTO personal(id,name,age,gender,phone,city)
VALUES
(2,"Sarita","18","4015155","Agra");
```

Test DEFAULT value by skip city column value

```
INSERT INTO personal(id,name,age,gender,phone,city)
VALUES
(3,"Salman Khan","20","M","4012155");
```

Test UNIQUE value by add same phone number

```
INSERT INTO personal(id,name,age,gender,phone,city)
VALUES
(4,"Juhi Chawla","21","F","4016155");
```

Test constraints on AGE

```
INSERT INTO personal(id,name,age,gender,phone,city)
VALUES
(5,"John","18","F","4017755");
```

Create Table

```
CREATE TABLE personal(
    id INT NOT NULL UNIQUE,
    name VARCHAR(50) NOT NULL,
    age INT NOT NULL CHECK(age >= 18),
    gender VARCHAR(1) NOT NULL,
    phone VARCHAR(10) NOT NULL UNIQUE,
    city VARCHAR(15) NOT NULL DEFAULT "Agra"
```

```
);
```

## Insert Records

```
INSERT INTO personal(id,name,age,gender,phone,city)
VALUES
(1,"Ram Kumar","13","M","4022155","Agra"),
(2,"Sarita Kumari","21","F","4034421","Delhi"),
(3,"Salman Khan","20","M","4056221","Agra"),
(4,"Juhi Chawla","18","F","4022155","Bhopal"),
(5,"Anil Kapoor","22","M","4025221","Agra"),
(6,"John Abraham","21","M","4056776","Delhi");
```

## Select Query Examples

```
SELECT * FROM personal;
SELECT id,name,phone FROM personal;
SELECT id AS Id,name AS Student,phone AS Phone FROM personal;
```

### Select with Where

```
SELECT * FROM personal WHERE gender = "F";
SELECT * FROM personal WHERE age<20;
SELECT * FROM personal WHERE city != "Agra";
SELECT * FROM personal WHERE city = "Agra";
SELECT id, name FROM personal WHERE city < > "Agra";
```

## reate Table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

## Insert Records

```
INSERT INTO personal(id,name,age,gender,phone,city)  
VALUES  
(1,"Ram Kumar","13","M","4022155","Agra"),  
(2,"Sarita Kumari","21","F","4034421","Delhi"),  
(3,"Salman Khan","20","M","4056221","Agra"),  
(4,"Juhi Chawla","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","22","M","4025221","Agra"),  
(6,"John Abraham","21","M","4056776","Delhi");
```

## AND, OR, NOT

```
SELECT * FROM personal WHERE age >= 18 AND age <= 21;
```

```
SELECT * FROM personal WHERE age <= 20 AND gender = "M";
```

```
SELECT * FROM personal WHERE age <= 20 OR city = "Agra";
```

```
SELECT * FROM personal WHERE (city = "Bhopal" OR city = "Agra") AND  
gender = "M";
```

```
SELECT * FROM personal WHERE NOT (city = "Bhopal" OR city = "Agra");
```

```
SELECT * FROM personal WHERE NOT age >= 20;
```

create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

Insert Records

```
INSERT INTO personal(id,name,age,gender,phone,city)  
VALUES  
(1,"Ram Kumar","13","M","4022155","Agra"),  
(2,"Sarita Kumari","21","F","4034421","Delhi"),  
(3,"Salman Khan","20","M","4056221","Agra"),  
(4,"Juhi Chawla","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","22","M","4025221","Agra"),  
(6,"John Abraham","21","M","4056776","Delhi");
```



## IN & NOT IN

```
SELECT * FROM personal WHERE age IN(18,21);
```

```
SELECT * FROM personal WHERE age IN(18,21,19);
```

```
SELECT * FROM personal WHERE age NOT IN(18,21,19);
```

```
SELECT * FROM personal WHERE city IN("Delhi","Bhopal");
```

```
SELECT * FROM personal WHERE city NOT IN("Delhi","Bhopal");
```

```
SELECT * FROM personal WHERE id IN(1,3,4);
```

## create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

## insert records

```
INSERT INTO personal(id,name,age,gender,phone,city)  
VALUES
```

```
(1,"Ram Kumar","13","M","4022155","Agra"),  
(2,"Sarita Kumari","21","F","4034421","Delhi"),  
(3,"Salman Khan","20","M","4056221","Agra"),  
(4,"Juhi Chawla","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","22","M","4025221","Agra"),  
(6,"John Abraham","21","M","4056776","Delhi");
```

## BETWEEN & NOT BETWEEN

```
SELECT * FROM personal WHERE age BETWEEN 18 AND 20;
```

```
SELECT * FROM personal WHERE age NOT BETWEEN 18 AND 20;
```

```
SELECT * FROM personal WHERE id BETWEEN 2 AND 5;
```

```
SELECT * FROM personal WHERE id NOT BETWEEN 2 AND 5;
```

```
SELECT * FROM personal WHERE name BETWEEN "a" AND "k";
```

```
SELECT * FROM personal WHERE name BETWEEN "anil" AND "kamal";
```

```
SELECT * FROM personal WHERE date BETWEEN "a" AND "k";
```

Create new database "test" for use BETWEEN with date EXAMPLE

Create table "persons" under "test" database

```
CREATE TABLE persons(
```

```
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    birth_date DATE NOT NULL  
);
```

insert records in "persons" table

```
INSERT INTO persons(id,name,birth_date)  
  
VALUES  
  
(1,"Ram","1995-02-10"),  
(2,"Madan","1995-11-03"),  
(3,"Salman","1996-06-12"),  
(4,"Shoiab","1995-04-21"),  
(5,"juhi","1996-09-25");
```

BETWEEN & NOT BETWEEN with date

```
SELECT * FROM persons WHERE birth_date BETWEEN "1995-01-01" AND "1995-06-30";
```

create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

insert records

```
INSERT INTO personal(id,name,age,gender,phone,city)
```

```
VALUES
```

```
(1,"Ram Kumar","13","M","4022155","Agra"),  
(2,"Sarita Kumari","21","F","4034421","Delhi"),  
(3,"Salman Khan","20","M","4056221","Agra"),  
(4,"Juhi Chawla","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","22","M","4025221","Agra"),  
(6,"John Abraham","21","M","4056776","Delhi");
```

### LIKE Operator & Wildcards

```
SELECT * FROM personal WHERE name LIKE "s%";
```

```
SELECT * FROM personal WHERE name LIKE "a%";
```

```
SELECT * FROM personal WHERE name LIKE "ram%";
```

```
SELECT * FROM personal WHERE name LIKE "rm%";
```

```
SELECT * FROM personal WHERE name LIKE "%am%";
```

```
SELECT * FROM personal WHERE name LIKE "r%" OR name LIKE "s%";
```

```
SELECT * FROM personal WHERE name NOT LIKE "r%";
```

```
SELECT * FROM personal WHERE BINARY name LIKE "r%";
```

```
SELECT * FROM personal WHERE name LIKE "%r";
```

```
SELECT * FROM personal WHERE name LIKE "%ar";
```

```
SELECT * FROM personal WHERE phone LIKE "%21";
```

```
SELECT * FROM personal WHERE name NOT LIKE "%21";
```

```
SELECT * FROM personal WHERE name LIKE "s%n";
```

```
SELECT * FROM personal WHERE name LIKE "r%r";
```

```
SELECT * FROM personal WHERE name LIKE "_am%";
```

```
SELECT * FROM personal WHERE name LIKE "__m%";
```

```
SELECT * FROM personal WHERE name LIKE "__l%";
```

```
SELECT * FROM personal WHERE name LIKE "r_m%";
```

## MySQL Regular Expression

create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),
```

```
gender VARCHAR(1) NOT NULL,  
phone VARCHAR(10) NOT NULL UNIQUE,  
city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

insert records

```
INSERT INTO personal(id,name,age,gender,phone,city)  
VALUES  
(1,"Ram Kumar","13","M","4022155","Agra"),  
(2,"Sarita Kumari","21","F","4034421","Delhi"),  
(3,"Salman Khan","20","M","4056221","Agra"),  
(4,"Juhi Chawla","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","22","M","4025221","Agra"),  
(6,"John Abraham","21","M","4056776","Delhi");
```

## Regular Expression

```
SELECT * FROM personal WHERE name REGEXP "ra";
```

```
SELECT * FROM personal WHERE name REGEXP "ta";
```

```
SELECT * FROM personal WHERE name REGEXP "man";
```

```
SELECT * FROM personal WHERE name REGEXP "^ra";
```

```
SELECT * FROM personal WHERE name REGEXP "^sa";
```

```
SELECT * FROM personal WHERE name REGEXP "an$";
```

```
SELECT * FROM personal WHERE name REGEXP "ram|kapoor|khan";
```

```
SELECT * FROM personal WHERE name REGEXP "ram|poor|khan";
```

```
SELECT * FROM personal WHERE name REGEXP "^ram|poor|^khan";
```

```
SELECT * FROM personal WHERE name REGEXP "^ram|poor|khan$";
```

```
SELECT * FROM personal WHERE name REGEXP "[is]";
```

```
SELECT * FROM personal WHERE name REGEXP "[rm]";
```

```
SELECT * FROM personal WHERE name REGEXP "[rm]a";
```

```
SELECT * FROM personal WHERE name REGEXP "[rmh]a";
```

```
SELECT * FROM personal WHERE name REGEXP "^[rs]";
```

```
SELECT * FROM personal WHERE name REGEXP "[rs]$";
```

```
SELECT * FROM personal WHERE name REGEXP "[ra]$";
```

```
SELECT * FROM personal WHERE name REGEXP "r[am]";
```

```
SELECT * FROM personal WHERE name REGEXP "[a-j]r";
```

## MySQL ORDER BY & DISTINCT

### create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

### insert records

```
INSERT INTO personal(id,name,age,gender,phone,city)  
VALUES  
  
(1,"Ram Kumar","13","M","4022155","Agra"),  
(2,"Sarita Kumari","21","F","4034421","Delhi"),  
(3,"Salman Khan","20","M","4056221","Agra"),  
(4,"Juhi Chawla","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","22","M","4025221","Agra"),  
(6,"John Abraham","21","M","4056776","Delhi");
```

### ORDER BY

```
SELECT * FROM personal ORDER BY name;
```



```
SELECT * FROM personal ORDER BY name DESC;
```

```
SELECT * FROM personal WHERE city = "Agra" ORDER BY name DESC;
```

```
SELECT * FROM personal WHERE city = "Agra" ORDER BY name;
```

```
SELECT * FROM personal ORDER BY age;
```

```
SELECT * FROM personal ORDER BY city;
```

```
SELECT * FROM personal ORDER BY name,city;
```

## DISTINCT

```
SELECT DISTINCT city FROM personal;
```

```
SELECT DISTINCT age FROM personal;
```

```
SELECT DISTINCT age FROM personal ORDER BY age;
```

## MySQL IS NULL & IS NOT NULL

### Create table

```
CREATE TABLE persons(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50),  
    birth_date DATE  
);
```

insert records

```
INSERT INTO persons(id,name,birth_date)
VALUES
(1,"Ram","1995-02-10"),
(2,"Madan","1995-11-03"),
(3,"Salman","1996-06-12"),
(4,"Shoiab","1995-04-21"),
(5,"juhi","1996-09-25"),
(6,"Raman",NULL),
(7,NULL,"1996-08-10");
```

IS NULL & NOT NULL

```
SELECT * FROM persons WHERE birth_date IS NULL;
```

```
SELECT * FROM persons WHERE name IS NULL;
```

```
SELECT * FROM persons WHERE name NOT NULL;
```

MySQL LIMIT & OFFSET

create table

```
CREATE TABLE personal(
    id INT NOT NULL UNIQUE,
    name VARCHAR(50) NOT NULL,
    age INT NOT NULL CHECK(age >= 18),
    gender VARCHAR(1) NOT NULL,
    phone VARCHAR(10) NOT NULL UNIQUE,
```

```
city VARCHAR(15) NOT NULL DEFAULT "Agra"
);
```

insert records

```
INSERT INTO personal(id,name,age,gender,phone,city)
VALUES
(1,"Ram Kumar","13","M","4022155","Agra"),
(2,"Sarita Kumari","21","F","4034421","Delhi"),
(3,"Salman Khan","20","M","4056221","Agra"),
(4,"Juhi Chawla","18","F","4022155","Bhopal"),
(5,"Anil Kapoor","22","M","4025221","Agra"),
(6,"John Abraham","21","M","4056776","Delhi"),
(7,"Shahid Kapoor","20","M","4022784","Agra");
```

Limit

```
SELECT * FROM personal LIMIT 2;
```

```
SELECT * FROM personal LIMIT 3;
```

```
SELECT * FROM personal WHERE city = "Agra" LIMIT 3;
```

```
SELECT * FROM personal WHERE city = "Agra" ORDER BY name LIMIT 3;
```

Offset

```
SELECT * FROM personal LIMIT 3, 3;
```

```
SELECT * FROM personal LIMIT 6, 3;
```

```
SELECT * FROM personal LIMIT 0, 3;
```

MySQL Count, Sum, Min, Max, Avg  
create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

insert records

```
INSERT INTO personal(id,name,percentage,age,gender,phone,city)  
VALUES  
(1,"Ram Kumar","45","13","M","4022155","Agra"),  
(2,"Sarita Kumari","56","21","F","4034421","Delhi"),  
(3,"Salman Khan","62","20","M","4056221","Agra"),  
(4,"Juhi Chawla","47","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","74","22","M","4025221","Agra"),  
(6,"John Abraham","64","21","M","4056776","Delhi"),  
(7,"Shahid Kapoor","52","20","M","4022784","Agra");
```

## COUNT

```
SELECT COUNT(name) FROM personal;
```

```
SELECT COUNT(*) FROM personal;
```

```
SELECT COUNT(DISTINCT city) FROM personal;
```

```
SELECT COUNT(DISTINCT city) AS Count FROM personal;
```

## MAX

```
SELECT MAX(percentage) AS Percentage FROM personal;
```

## MIN

```
SELECT MIN(percentage) AS Percentage FROM personal;
```

```
SELECT MIN(percentage) AS Percentage,name,city FROM personal;
```

## SUM

```
SELECT SUM(percentage) AS Total FROM personal;
```

## AVG

```
SELECT AVG(percentage) AS Average FROM personal;
```

## MySQL UPDATE

create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,
```

```
name VARCHAR(50) NOT NULL,  
percentage INT NOT NULL,  
age INT NOT NULL CHECK(age >= 18),  
gender VARCHAR(1) NOT NULL,  
phone VARCHAR(10) NOT NULL UNIQUE,  
city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

insert records

```
INSERT INTO personal(id,name,percentage,age,gender,phone,city)  
VALUES  
(1,"Ram Kumar","45","13","M","4022155","Agra"),  
(2,"Sarita Kumari","56","21","F","4034421","Delhi"),  
(3,"Salman Khan","62","20","M","4056221","Agra"),  
(4,"Juhi Chawla","47","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","74","22","M","4025221","Agra"),  
(6,"John Abraham","64","21","M","4056776","Delhi"),  
(7,"Shahid Kapoor","52","20","M","4022784","Agra");
```

UPDATE

```
UPDATE personal SET phone = "4055555" WHERE id = 1;
```

```
UPDATE personal SET percentage = 66 WHERE id = 2;
```

```
UPDATE personal SET age = 18 WHERE id IN (2,3);
```

```
UPDATE personal SET age = 19;
```

## MySQL COMMIT & ROLLBACK

create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

insert records

```
INSERT INTO personal(id,name,percentage,age,gender,phone,city)  
VALUES  
  
(1,"Ram Kumar","45","13","M","4022155","Agra"),  
(2,"Sarita Kumari","56","21","F","4034421","Delhi"),  
(3,"Salman Khan","62","20","M","4056221","Agra"),  
(4,"Juhi Chawla","47","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","74","22","M","4025221","Agra"),  
(6,"John Abraham","64","21","M","4056776","Delhi"),  
(7,"Shahid Kapoor","52","20","M","4022784","Agra");
```

## COMMIT & ROLLBACK

```
SELECT * FROM personal;
```

```
COMMIT;
```

```
UPDATE personal SET percentage = 60 WHERE id = 2;
```

```
ROLLBACK;
```

```
SELECT * FROM personal;
```

```
COMMIT;
```

```
UPDATE personal SET age = 20 WHERE id = 4;
```

```
UPDATE personal SET percentage = 60 WHERE id = 2;
```

```
ROLLBACK;
```

```
SELECT * FROM personal;
```

```
UPDATE personal SET age = 20 WHERE id = 4;
```

```
COMMIT;
```

```
UPDATE personal SET percentage = 60 WHERE id = 2;
```

```
ROLLBACK;
```



## MySQL DELETE

create table

```
CREATE TABLE personal(  
    id INT NOT NULL UNIQUE,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL CHECK(age >= 18),  
    gender VARCHAR(1) NOT NULL,  
    phone VARCHAR(10) NOT NULL UNIQUE,  
    city VARCHAR(15) NOT NULL DEFAULT "Agra"  
);
```

insert records

```
INSERT INTO personal(id,name,percentage,age,gender,phone,city)  
VALUES  
(1,"Ram Kumar","45","13","M","4022155","Agra"),  
(2,"Sarita Kumari","56","21","F","4034421","Delhi"),  
(3,"Salman Khan","62","20","M","4056221","Agra"),  
(4,"Juhi Chawla","47","18","F","4022155","Bhopal"),  
(5,"Anil Kapoor","74","22","M","4025221","Agra"),  
(6,"John Abraham","64","21","M","4056776","Delhi"),  
(7,"Shahid Kapoor","52","20","M","4022784","Agra");
```

DELETE

```
//COMMIT;
```

```
DELETE FROM personal WHERE id = 4;
```

```
DELETE FROM personal WHERE gender = "F";
```

```
DELETE FROM personal WHERE age > 20;
```

```
DELETE FROM personal;
```

```
//ROLLBACK;
```

MySQL PRIMARY KEY & FOREIGN KEY  
create table "city"

```
CREATE TABLE city(  
    cid INT NOT NULL AUTO_INCREMENT,  
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);
```

insert records in "city" table

```
INSERT INTO city(cityname)  
VALUES("Agra"),  
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

create table "personal" and insert records

```
CREATE TABLE personal(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid)  
);
```

```
INSERT INTO personal(id,name,percentage,age,gender,city)
```

VALUES

```
(1,"Ram Kumar","45","13","M",1),  
(2,"Sarita Kumari","56","21","F",2),  
(3,"Salman Khan","62","20","M",1),  
(4,"Juhi Chawla","47","18","F",3),  
(5,"Anil Kapoor","74","22","M",1),  
(6,"John Abraham","64","21","M",2),  
(7,"Shahid Kapoor","52","20","M",1);
```

MySQL INNER JOIN

create table "personal" and insert records

```
CREATE TABLE personal(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,
```

```
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid)  
);  
  
INSERT INTO personal(id,name,percentage,age,gender,city)  
VALUES  
(1,"Ram Kumar","45","13","M",1),  
(2,"Sarita Kumari","56","21","F",2),  
(3,"Salman Khan","62","20","M",1),  
(4,"Juhi Chawla","47","18","F",3),  
(5,"Anil Kapoor","74","22","M",1),  
(6,"John Abraham","64","21","M",2),  
(7,"Shahid Kapoor","52","20","M",1);
```

create table "city" and insert records

```
CREATE TABLE city(  
    cid INT NOT NULL AUTO_INCREMENT,  
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);  
  
INSERT INTO city(cityname)  
VALUES("Agra"),
```

```
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

## INNER JOIN

```
SELECT * FROM personal INNER JOIN city  
ON personal.city = city.cid;
```

```
SELECT * FROM personal p INNER JOIN city c  
ON p.city = c.cid;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname  
FROM personal p INNER JOIN city c  
ON p.city = c.cid;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
WHERE c.cityname = "Agra";
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
WHERE c.cityname = "Agra"  
ORDER BY p.name;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname
FROM personal p JOIN city c
ON p.city = c.cid
WHERE c.cityname = "Agra"
ORDER BY p.name;
```

### MySQL LEFT JOIN & RIGHT JOIN

create table "personal" and insert records

```
CREATE TABLE personal(
    id INT NOT NULL,
    name VARCHAR(50) NOT NULL,
    percentage INT NOT NULL,
    age INT NOT NULL,
    gender VARCHAR(1) NOT NULL,
    city INT NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY (city) REFERENCES City (cid)
);

INSERT INTO personal(id,name,percentage,age,gender,city)
VALUES
(1,"Ram Kumar","45","13","M",1),
(2,"Sarita Kumari","56","21","F",2),
(3,"Salman Khan","62","20","M",1),
(4,"Juhi Chawla","47","18","F",3),
(5,"Anil Kapoor","74","22","M",1),
```

```
(6,"John Abraham","64","21","M",2),  
(7,"Shahid Kapoor","52","20","M",1);
```

create table "city" and insert records

```
CREATE TABLE city(  
    cid INT NOT NULL AUTO_INCREMENT,  
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);
```

```
INSERT INTO city(cityname)  
VALUES("Agra"),  
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

## LEFT JOIN

```
SELECT * FROM personal LEFT JOIN city  
ON personal.city = city.cid;
```

```
SELECT * FROM personal INNER JOIN city  
ON personal.city = city.cid;
```

```
SELECT * FROM personal p LEFT JOIN city c  
ON p.city = c.cid;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname
FROM personal p LEFT JOIN city c
ON p.city = c.cid;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname
FROM personal p LEFT JOIN city c
ON p.city = c.cid
WHERE gender = "M";
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname
FROM personal p LEFT JOIN city c
ON p.city = c.cid
WHERE gender = "M"
ORDER BY name;
```

## RIGHT JOIN

```
SELECT * FROM personal RIGHT JOIN city
ON personal.city = city.cid;
```

```
SELECT * FROM personal p RIGHT JOIN city c
ON p.city = c.cid;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname
FROM personal p RIGHT JOIN city c
ON p.city = c.cid;
```



## MySQL CROSS JOIN

create table "personal" and insert records

```
CREATE TABLE personal(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid)  
);  
  
INSERT INTO personal(id,name,percentage,age,gender,city)  
VALUES  
(1,"Ram Kumar","45","13","M",1),  
(2,"Sarita Kumari","56","21","F",2),  
(3,"Salman Khan","62","20","M",1),  
(4,"Juhi Chawla","47","18","F",3),  
(5,"Anil Kapoor","74","22","M",1),  
(6,"John Abraham","64","21","M",2),  
(7,"Shahid Kapoor","52","20","M",1);
```

create table "city" and insert records

```
CREATE TABLE city(  
    cid INT NOT NULL AUTO_INCREMENT,
```

```
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);
```

```
INSERT INTO city(cityname)  
VALUES("Agra"),  
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

## CROSS JOIN

```
SELECT p.id,p.name,c.cityname  
FROM personal p CROSS JOIN city c;
```

```
SELECT p.id,p.name AS Name,c.cityname AS City  
FROM personal p CROSS JOIN city c;
```

```
SELECT p.id,p.name AS Name,c.cityname AS City  
FROM personal p , city c;
```

## MySQL JOIN MULTIPLE TABLES

create table "personal" and insert records

```
CREATE TABLE personal(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,
```

```

        age INT NOT NULL,

        gender VARCHAR(1) NOT NULL,

        city INT NOT NULL,

        courses INT NOT NULL,

        PRIMARY KEY (id),

        FOREIGN KEY (city) REFERENCES City (cid),

        FOREIGN KEY (courses) REFERENCES Courses (course_id)

);

INSERT INTO personal(id,name,percentage,age,gender,city,courses)
VALUES

(1,"Ram Kumar","45","13","M",1,1),
(2,"Sarita Kumari","56","21","F",2,2),
(3,"Salman Khan","62","20","M",1,1),
(4,"Juhi Chawla","47","18","F",3,1),
(5,"Anil Kapoor","74","22","M",1,3),
(6,"John Abraham","64","21","M",2,2),
(7,"Shahid Kapoor","52","20","M",1,3);

```

create table "city" and insert records

```

CREATE TABLE city(

        cid INT NOT NULL AUTO_INCREMENT,

        cityname VARCHAR(50) NOT NULL,

        PRIMARY KEY (cid)

);

```

```
INSERT INTO city(cityname)
VALUES("Agra"),
("Delhi"),
("Bhopal"),
("Jaipur"),
("Noida");
```

create table "courses" and insert records

```
CREATE TABLE courses(
    course_id INT NOT NULL AUTO_INCREMENT,
    course_name VARCHAR(50) NOT NULL,
    PRIMARY KEY (course_id)
);
```

```
INSERT INTO courses(course_name)
VALUES("Btech"),
("BCA"),
("MBA");
```

### Join Multiple Tables

```
SELECT * FROM personal p INNER JOIN city c
ON p.city = c.cid;
```

```
SELECT * FROM personal p INNER JOIN city c
ON p.city = c.cid
INNER JOIN courses cr
```

```
ON p.courses = cr.course_id;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname,cr.course_name  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
INNER JOIN courses cr  
ON p.courses = cr.course_id;
```

```
SELECT p.id,p.name,p.percentage,p.age,p.gender,c.cityname,cr.course_name  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
INNER JOIN courses cr  
ON p.courses = cr.course_id  
WHERE c.cityname = "Agra";
```

## MySQL GROUP BY & HAVING

create table "personal" and insert records

```
CREATE TABLE personal(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    courses INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid),
```

```
        FOREIGN KEY (courses) REFERENCES Courses (course_id)
    );

INSERT INTO personal(id,name,percentage,age,gender,city,courses)
VALUES
(1,"Ram Kumar","45","13","M",1,1),
(2,"Sarita Kumari","56","21","F",2,2),
(3,"Salman Khan","62","20","M",1,1),
(4,"Juhi Chawla","47","18","F",3,1),
(5,"Anil Kapoor","74","22","M",1,3),
(6,"John Abraham","64","21","M",2,2),
(7,"Shahid Kapoor","52","20","M",1,3);
```

create table "city" and insert records

```
CREATE TABLE city(
    cid INT NOT NULL AUTO_INCREMENT,
    cityname VARCHAR(50) NOT NULL,
    PRIMARY KEY (cid)
);

INSERT INTO city(cityname)
VALUES("Agra"),
("Delhi"),
("Bhopal"),
("Jaipur"),
("Noida");
```

create table "courses" and insert records

```
CREATE TABLE courses(  
    course_id INT NOT NULL AUTO_INCREMENT,  
    course_name VARCHAR(50) NOT NULL,  
    PRIMARY KEY (course_id)  
);
```

```
INSERT INTO courses(course_name)  
VALUES("Btech"),  
("BCA"),  
("MBA");
```

## GROUP BY

```
SELECT city,COUNT(city)  
FROM personal  
GROUP BY city;
```

```
SELECT c.cityname,COUNT(p.city)  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
GROUP BY city;
```

```
SELECT c.cityname,COUNT(p.city) AS Total  
FROM personal p INNER JOIN city c  
ON p.city = c.cid
```

```
GROUP BY city;
```

```
SELECT c.cityname,COUNT(p.city) AS Total  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
WHERE p.age >= 20  
GROUP BY city;
```

```
SELECT c.cityname,COUNT(p.city) AS Total  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
GROUP BY city  
ORDER BY COUNT(p.city);
```

```
SELECT c.cityname,COUNT(p.city) AS Total  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
GROUP BY city  
ORDER BY COUNT(p.city) DESC;
```

## HAVING

```
SELECT c.cityname,COUNT(p.city) AS Total  
FROM personal p INNER JOIN city c  
ON p.city = c.cid  
GROUP BY city  
HAVING COUNT(p.city) > 3
```



```
ORDER BY COUNT(p.city) DESC;
```

## MySQL SubQuery with EXISTS & NOT EXISTS

create table "personal" and insert records

```
CREATE TABLE personal(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    courses INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid),  
    FOREIGN KEY (courses) REFERENCES Courses (course_id)  
);  
  
INSERT INTO personal(id,name,percentage,age,gender,city,courses)  
VALUES  
(1,"Ram Kumar","45","13","M",1,1),  
(2,"Sarita Kumari","56","21","F",2,2),  
(3,"Salman Khan","62","20","M",1,1),  
(4,"Juhi Chawla","47","18","F",3,1),  
(5,"Anil Kapoor","74","22","M",1,3),  
(6,"John Abraham","64","21","M",2,2),  
(7,"Shahid Kapoor","52","20","M",1,3);
```

create table "courses" and insert records

```
CREATE TABLE courses(  
    course_id INT NOT NULL AUTO_INCREMENT,  
    course_name VARCHAR(50) NOT NULL,  
    PRIMARY KEY (course_id)  
);
```

```
INSERT INTO courses(course_name)  
VALUES("Btech"),  
("BCA"),  
("MBA");
```

use SubQuery

```
SELECT name FROM personal  
WHERE courses = (SELECT course_id FROM courses WHERE course_name = "MBA");
```

```
SELECT course_id FROM courses WHERE course_name = "MBA";
```

```
SELECT name FROM personal  
WHERE courses IN (SELECT course_id FROM courses WHERE course_name IN  
("MBA","Btech"));
```

Exists & Not Exists

```
SELECT name FROM personal  
WHERE EXISTS (SELECT course_id FROM courses WHERE course_name IN ("MBA"));
```

```
SELECT name FROM personal
```

```
WHERE EXISTS (SELECT course_id FROM courses WHERE course_name IN  
("Mtech"));
```

```
SELECT name FROM personal
```

```
WHERE NOT EXISTS (SELECT course_id FROM courses WHERE course_name IN  
("Mtech"));
```

```
SELECT name FROM personal
```

```
WHERE NOT EXISTS (SELECT course_id FROM courses WHERE course_name IN  
("MBA"));
```

MySQL UNION & UNION ALL

create table "students" and insert records

```
CREATE TABLE students(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    courses INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid),  
    FOREIGN KEY (courses) REFERENCES Courses (course_id)  
);
```

```
INSERT INTO students(id,name,age,gender,city,courses)
```

VALUES

```
(1,"Ram Kumar","19","M",1,1),  
(2,"Sarita Kumari","22","F",2,2),  
(3,"Salman Khan","20","M",1,1),  
(4,"Juhi Chawla","18","F",3,3),  
(5,"Anil Kapoor","22","M",1,3),  
(6,"John Abraham","21","M",2,2),  
(7,"Shahid Kapoor","20","M",1,1);
```

create table "city" and insert records

```
CREATE TABLE city(  
    cid INT NOT NULL AUTO_INCREMENT,  
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);
```

INSERT INTO city(cityname)

```
VALUES("Agra"),  
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

create table "courses" and insert records

```
CREATE TABLE courses(  
    course_id INT NOT NULL AUTO_INCREMENT,
```

```
    course_name VARCHAR(50) NOT NULL,  
    PRIMARY KEY (course_id)  
);
```

```
INSERT INTO courses(course_name)  
VALUES("Btech"),  
("BCA"),  
("MBA");
```

create table "lecturers" and insert records

```
CREATE TABLE lecturers(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    courses INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid),  
    FOREIGN KEY (courses) REFERENCES Courses (course_id)  
);
```

```
INSERT INTO lecturers(id,name,age,gender,city,courses)  
VALUES  
(1,"Raj Kapoor","37","M",1,2),  
(2,"Sadhna","39","F",4,3),
```

```
(3, "Ram Kumar", "38", "M", 2, 1),  
(4, "Salim Khan", "45", "M", 3, 2),  
(5, "Nagma", "42", "F", 2, 1);
```

## UNION & UNION ALL

```
SELECT * FROM students
```

```
UNION
```

```
SELECT * FROM lecturers;
```

```
SELECT name FROM students
```

```
UNION
```

```
SELECT name FROM lecturers;
```

```
SELECT name FROM students
```

```
UNION ALL
```

```
SELECT name FROM lecturers;
```

```
SELECT name,age FROM students
```

```
UNION ALL
```

```
SELECT name,age FROM lecturers;
```

```
SELECT name,age FROM students WHERE gender ="M"
```

```
UNION ALL
```

```
SELECT name,age FROM lecturers WHERE gender ="M";
```

```
SELECT name,age FROM students WHERE gender ="M"  
UNION ALL  
SELECT name,age FROM lecturers WHERE gender ="F";
```

```
SELECT name,age FROM students WHERE city =2  
UNION ALL  
SELECT name,age FROM lecturers WHERE city = 2;
```

```
SELECT name,age FROM students  
WHERE city = (SELECT cid FROM city WHERE cityname = "Delhi")  
UNION ALL  
SELECT name,age FROM lecturers  
WHERE city = (SELECT cid FROM city WHERE cityname = "Delhi");
```

```
SELECT s.name,s.age, c.cityname FROM students s  
INNER JOIN city c ON s.city = c.cid  
WHERE c.cityname = "Delhi"  
UNION ALL  
SELECT l.name,l.age,ci.cityname FROM lecturers l  
INNER JOIN city ci ON l.city = ci.cid  
WHERE ci.cityname = "Delhi";
```

MySQL IF & CASE Statement  
create table "students" and insert records

```
CREATE TABLE students(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    courses INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid),  
    FOREIGN KEY (courses) REFERENCES Courses (course_id)  
);
```

```
INSERT INTO students(id,name,percentage,age,gender,city,courses)  
VALUES  
(1,"Ram Kumar","45","19","M",1,1),  
(2,"Sarita Kumari","85","22","F",2,2),  
(3,"Salman Khan","29","20","M",1,1),  
(4,"Juhi Chawla","47","18","F",3,3),  
(5,"Anil Kapoor","74","22","M",1,3),  
(6,"John Abraham","64","21","M",2,2),  
(7,"Shahid Kapoor","120","20","M",1,1);
```

IF Clause



```
SELECT id,name,percentage,  
IF(percentage >= 33,"Pass","Fail") AS Result  
FROM students;
```

## CASE Clause

```
SELECT id,name,percentage,  
CASE  
    WHEN percentage >= 80 AND percentage <=100 THEN "Merit"  
    WHEN percentage >= 60 AND percentage <=80 THEN "Ist Division"  
    WHEN percentage >= 45 AND percentage <=60 THEN "IInd Division"  
    WHEN percentage >= 33 AND percentage <=45 THEN "IIIRD Division"  
    WHEN percentage < 33 THEN "Fail"  
    ELSE "Not Correct %"  
END AS Grade  
FROM students;  
  
UPDATE students SET  
percentage = (CASE id  
    WHEN 3 THEN 39  
    WHEN 7 THEN 62  
END)  
WHERE id IN (3,7);
```

## MySQL Arithmetic Functions

create table "students" and insert records

```
CREATE TABLE students(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,
```

```

percentage INT NOT NULL,
age INT NOT NULL,
gender VARCHAR(1) NOT NULL,
city INT NOT NULL,
courses INT NOT NULL,
PRIMARY KEY (id),
FOREIGN KEY (city) REFERENCES City (cid),
FOREIGN KEY (courses) REFERENCES Courses (course_id)
);

INSERT INTO students(id,name,percentage,age,gender,city,courses)
VALUES
(1,"Ram Kumar","45","19","M",1,1),
(2,"Sarita Kumari","85","22","F",2,2),
(3,"Salman Khan","29","20","M",1,1),
(4,"Juhi Chawla","47","18","F",3,3),
(5,"Anil Kapoor","74","22","M",1,3),
(6,"John Abraham","64","21","M",2,2),
(7,"Shahid Kapoor","120","20","M",1,1);

```

## Arithmetic Functions

```
SELECT 5 + 6;
```

```
SELECT 5 + 6 AS Total;
```

```
SELECT 5 - 6 AS Total;
```

```
SELECT 5 * 6 AS Total;
```

```
SELECT 15 / 6 AS Total;
```

```
SELECT 15 DIV 6 AS Total;
```

```
SELECT 15 % 6 AS Total;
```

```
SELECT 15 MOD 6 AS Total;
```

```
SELECT id,name,percentage FROM students;
```

```
SELECT id,name,(percentage + 5) FROM students;
```

```
SELECT id,name,(percentage + 5) AS "NEW Percentage" FROM students;
```

```
SELECT id,name,(percentage * 5) AS "NEW Percentage" FROM students;
```

```
SELECT PI();
```

```
SELECT ROUND(4.51);
```

```
SELECT ROUND(4.49);
```

```
SELECT ROUND(-4.49);
```

```
SELECT ROUND(-4.55);
```

```
SELECT ROUND(1234.987);
```

```
SELECT ROUND(1234.987,2);
```

```
SELECT CEIL(1.23);
```

```
SELECT CEIL(1.56);
```

```
SELECT CEIL(4.23);
```

```
SELECT FLOOR(4.56);
```

```
SELECT FLOOR(4.40);
```

```
SELECT POW(2,2);
```

```
SELECT POW(2,3);
```

```
SELECT POW(4,3);
```

```
SELECT SQRT(16);
```

```
SELECT SQRT(4);
```

```
SELECT SQRT(5);
```

```
SELECT ROUND(SQRT(5));
```

```
SELECT RAND();
```

```
SELECT RAND() * 100;
```

```
SELECT ROUND(RAND() * 100);
```

```
SELECT FLOOR(7 + (RAND() * 6));
```

```
SELECT FLOOR(1 + (RAND() * 5));
```

```
SELECT id,name,percentage,RAND() FROM students;
```

```
SELECT id,name,percentage FROM students ORDER BY RAND();
```

```
SELECT ABS(-56);
```

```
SELECT ABS(-56.25);
```

```
SELECT ABS(56.25);
```

```
SELECT SIGN(25);
```

```
SELECT SIGN(0);
```

```
SELECT SIGN(-25);
```

```
SELECT SIGN(-3.25);
```

### MySQL String Functions

create table "students" and insert records

```
CREATE TABLE students(  
    id INT NOT NULL,  
    name VARCHAR(50) NOT NULL,  
    percentage INT NOT NULL,  
    age INT NOT NULL,  
    gender VARCHAR(1) NOT NULL,  
    city INT NOT NULL,  
    courses INT NOT NULL,  
    PRIMARY KEY (id),  
    FOREIGN KEY (city) REFERENCES City (cid),  
    FOREIGN KEY (courses) REFERENCES Courses (course_id)  
);
```

```
INSERT INTO students(id,name,percentage,age,gender,city,courses)  
VALUES
```

```
(1,"Ram Kumar","45","19","M",1,1),  
(2,"Sarita Kumari","85","22","F",2,2),  
(3,"Salman Khan","29","20","M",1,1),  
(4,"Juhi Chawla","47","18","F",3,3),  
(5,"Anil Kapoor","74","22","M",1,3),  
(6,"John Abraham","64","21","M",2,2),  
(7,"Shahid Kapoor","120","20","M",1,1);
```

## String Functions

```
SELECT id, UPPER(name) AS Name , percentage  
FROM students;
```

```
SELECT id, UCASE(name) AS Name , percentage  
FROM students;
```

```
SELECT id, LOWER(name) AS Name , percentage  
FROM students;
```

```
SELECT id, LCASE(name) AS Name , percentage  
FROM students;
```

```
SELECT id, name,CHARACTER_LENGTH(name) AS Characters  
FROM students;
```

```
SELECT id, name,CHAR_LENGTH(name) AS Characters  
FROM students;
```

```
SELECT id, name,LENGTH(name) AS Characters
FROM students;
```

```
SELECT id, CONCAT(name, " " ,percentage) AS Name
FROM students;
```

```
SELECT id, CONCAT(name, " - " ,percentage) AS Name
FROM students;
```

```
SELECT CONCAT("Yahoo","Baba","Youtube","Channel") AS Name;
```

```
SELECT CONCAT_WS("Yahoo","Baba","Youtube","Channel") AS Name;
```

```
SELECT CONCAT_WS(" - ","Baba","Youtube","Channel") AS Name;
```

```
SELECT "    Yahoo Baba    " AS Name;
```

```
SELECT LTRIM("    Yahoo Baba    ") AS Name;
```

```
SELECT "    Yahoo Baba          " AS Name;
```

```
SELECT RTRIM("    Yahoo Baba          ") AS Name;
```

```
SELECT TRIM("    Yahoo Baba          ") AS Name;
```



```
SELECT POSITION("Baba" IN "Yahoo Baba") AS Name;
```

```
SELECT POSITION("Baba" IN "Yahoo Baba Baba") AS Name;
```

```
SELECT POSITION("a" IN "Yahoo Baba Baba") AS Name;
```

```
SELECT INSTR("Yahoo Baba Baba","a") AS Name;
```

```
SELECT INSTR("Yahoo Baba Baba","Baba") AS Name;
```

```
SELECT INSTR("Yahoo Baba Baba","hoo") AS Name;
```

```
SELECT LOCATE("hoo","Yahoo Baba Baba") AS Name;
```

```
SELECT LOCATE("a","Yahoo Baba Baba") AS Name;
```

```
SELECT LOCATE("a","Yahoo Baba Baba",3) AS Name;
```

## MySQL String Functions - II

```
SELECT SUBSTRING("Yahoo Baba",3);
```

```
SELECT SUBSTRING("Yahoo Baba",3) AS Name;
```

```
SELECT SUBSTRING("Yahoo Baba",5) AS Name;
```

```
SELECT SUBSTRING("Yahoo Baba",3,6) AS Name;
```

```
SELECT SUBSTRING("Yahoo Baba",-6,3) AS Name;
```

```
SELECT SUBSTR("Yahoo Baba",-6,3) AS Name;
```

```
SELECT MID("Yahoo Baba",-6,3) AS Name;

SELECT SUBSTRING_INDEX("www.yahoobaba.net",".",1) AS Name;

SELECT SUBSTRING_INDEX("www.yahoobaba.net",".",2) AS Name;

SELECT SUBSTRING_INDEX("www.yahoobaba.net","o",2) AS Name;

SELECT LEFT("Yahoo Baba",3) AS Name;

SELECT LEFT("Yahoo Baba",5) AS Name;

SELECT RIGHT("Yahoo Baba",5) AS Name;

SELECT RIGHT("Yahoo Baba",3) AS Name;

SELECT RPAD("Yahoo Baba",20,"-") AS Name;

SELECT RPAD("Yahoo Baba",20,"ABC") AS Name;

SELECT LPAD("Yahoo Baba",20,"*") AS Name;

SELECT SPACE(100) AS Name;

SELECT REVERSE("Yahoo Baba") AS Name;

SELECT REPLACE("Yahoo Baba","Baba","Wow") AS Name;

SELECT REPLACE("Yahoo Baba Yoo Baba","Baba","Wow") AS Name;

SELECT STRCMP("Yahoo Baba","yahoo baba") AS Name;

SELECT STRCMP("Yahoo Baba","yahoo ") AS Name;

SELECT STRCMP("Yahoo ","yahoo baba") AS Name;

SELECT FIELD("a","X","a","k") AS Name;

SELECT FIELD("a","X","A","k") AS Name;

SELECT FIELD(5,0,1,2,3,4,5) AS Name;

SELECT FIELD("ram","Ram","Mohan","Shyam") AS Name;

SELECT FIND_IN_SET("ram","Ram,Mohan,Shyam") AS Name;

SELECT FIND_IN_SET("Mohan","Ram, Mohan, Shyam") AS Name;
```

```
SELECT FIND_IN_SET("Mohan", "Ram,Mohan,Shyam") AS Name;
```

```
SELECT FORMAT(255.3568,2) AS Value;
```

```
SELECT FORMAT(255.3568,3) AS Value;
```

```
SELECT HEX("Yahoo Baba") AS Value;
```

### MySQL Date Functions

```
SELECT CURRENT_DATE();
```

```
SELECT CURDATE();
```

```
SELECT SYSDATE();
```

```
SELECT NOW();
```

```
SELECT DATE("2019-10-15 09:34:21") AS DATE;
```

```
SELECT MONTH("2019-10-15 09:34:21") AS DATE;
```

```
SELECT MONTHNAME("2019-10-15 09:34:21") AS DATE;
```

```
SELECT YEAR("2019-10-15 09:34:21") AS DATE;
```

```
SELECT QUARTER("2019-10-15 09:34:21") AS DATE;
```

```
SELECT QUARTER("2019-03-15 09:34:21") AS DATE;
```

```
SELECT DAY("2019-10-15 09:34:21") AS DATE;
```

```
SELECT DAYOFMONTH("2019-10-15 09:34:21") AS DATE;
```

```
SELECT DAYNAME("2019-06-15 09:34:21") AS DATE;
```

```
SELECT DAYOFWEEK("2019-03-15 09:34:21") AS DATE;
```

```
SELECT DAYOFYEAR("2019-06-15 09:34:21") AS DATE;
```

```
SELECT WEEK("2019-06-15 09:34:21") AS DATE;
```

```
SELECT WEEKDAY("2019-03-15 09:34:21") AS DATE;
```

```
SELECT YEARWEEK("2019-06-15 09:34:21") AS DATE;
```

```
SELECT LAST_DAY("2019-02-15 09:34:21") AS DATE;
```

```
SELECT EXTRACT(MONTH FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(DAY FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(YEAR FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(WEEK FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(HOUR FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(MINUTE FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(SECOND FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(MICROSECOND FROM "2019-03-15 09:34:21") AS DATE;
SELECT EXTRACT(HOUR_MINUTE FROM "2019-03-15 09:34:21") AS DATE;
```

## MySQL Date Functions - II

```
SELECT ADDDATE("2019-06-15",INTERVAL 10 DAY) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 50 DAY) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 1 MONTH) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 1 WEEK) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 1 YEAR) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 1 QUARTER) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 12 HOUR) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 24 HOUR) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 500 MINUTE) AS Date;
SELECT ADDDATE("2019-06-15",INTERVAL 5000 MINUTE) AS Date;
SELECT DATE_ADD("2019-06-15",INTERVAL 5000 MINUTE) AS Date;
SELECT MAKEDATE(2019,3);
SELECT MAKEDATE(2016,3);
SELECT SUBDATE("2019-06-15",INTERVAL 1 DAY) AS Date;
```

```

SELECT SUBDATE("2019-06-15",INTERVAL 10 DAY) AS Date;
SELECT SUBDATE("2019-06-15",INTERVAL 10 MONTH) AS Date;
SELECT DATEDIFF("2019-06-15","2019-02-10") AS Date;
SELECT DATEDIFF("2019-06-15","2019-06-01") AS Date;
SELECT DATEDIFF("2019-06-15","2018-06-01") AS Date;
SELECT TO_DAYS("2019-06-15") AS Date;
SELECT FROM_DAYS("685000") AS Date;
SELECT PERIOD_ADD("685000",5) AS Date;
SELECT PERIOD_DIFF("685000","695000") AS Date;
SELECT DATE_FORMAT("2019-06-15","%Y") AS Date;
SELECT DATE_FORMAT("2019-06-15","%d/%b/%Y") AS Date;
SELECT DATE_FORMAT("2019-06-15","%d-%c-%Y") AS Date;
SELECT DATE_FORMAT("2019-06-15","%d/%b/%y") AS Date;
SELECT DATE_FORMAT("2019-06-15","%d-%c-%y, %W") AS Date;
SELECT DATE_FORMAT("2019-06-15 02:30:50:20","%d-%c-%y, %h:%i") AS Date;
SELECT STR_TO_DATE("July 10 2019","%M %d %Y") AS Date;

```

## MySQL Time Functions

```

SELECT CURRENT_TIME();

SELECT CURTIME();

SELECT CURRENT_TIMESTAMP();

SELECT LOCALTIME();

SELECT LOCALTIMESTAMP();

SELECT TIME("2019-06-15 13:15:20") AS Time;

SELECT HOUR("2019-06-15 13:15:20") AS Time;

```

```

SELECT MINUTE("2019-06-15 13:15:20") AS Time;
SELECT SECOND("2019-06-15 13:15:20") AS Time;
SELECT MICROSECOND("2019-06-15 13:15:20") AS Time;
SELECT TIMEDIFF("18:10:11","13:15:20") AS Time;
SELECT TIMEDIFF("14:10:11","13:15:20") AS Time;
SELECT ADDTIME("2019-06-15 05:30:20.000001","5:5.000003") AS Time;
SELECT ADDTIME("2019-06-15 05:30:20.000001","2:10:5.000003") AS Time;
SELECT ADDTIME("2019-06-15 05:30:20.000001","5 2:10:5.000003") AS Time;
SELECT SUBTIME("2019-06-15 05:30:20.000001","5 2:10:5.000003") AS Time;
SELECT MAKETIME(16,15,20) AS Time;
SELECT TIMESTAMP("2019-06-15","13:15:20") AS Time;
SELECT TIME_FORMAT("13:15:20","%H") AS Time;
SELECT TIME_FORMAT("13:15:20","%H %i %s") AS Time;
SELECT TIME_FORMAT("13:15:20","%H-%i-%s") AS Time;
SELECT TIME_FORMAT("13:15:20","%H-%i-%s %p") AS Time;
SELECT SEC_TO_TIME("1") AS Time;
SELECT SEC_TO_TIME("5454") AS Time;

```

## MySQL ALTER

create table "students" and insert records

```

CREATE TABLE students(
    id INT NOT NULL,
    name VARCHAR(50) NOT NULL,
    percentage INT NOT NULL,
    dob DATE NOT NULL,

```

```

        age INT NOT NULL,

        gender VARCHAR(1) NOT NULL,

        city INT NOT NULL,

        courses INT NOT NULL,

        PRIMARY KEY (id),

        FOREIGN KEY (city) REFERENCES City (cid),

        FOREIGN KEY (courses) REFERENCES Courses (course_id)

);

INSERT INTO students(id,name,percentage,dob,age,gender,city,courses)
VALUES

(1,"Ram Kumar","45","2000-05-10","19","M",1,1),
(2,"Sarita Kumari","85","1997-02-03","22","F",2,2),
(3,"Salman Khan","29","1999-11-12","20","M",1,1),
(4,"Juhi Chawla","47","2001-07-16","18","F",3,1),
(5,"Anil Kapoor","74","1997-01-03","22","M",1,3),
(6,"John Abraham","64","1998-08-10","21","M",2,2),
(7,"Shahid Kapoor","62","1999-12-08","20","M",1,3);

```

create table "courses" and insert records

```

CREATE TABLE courses(

        course_id INT NOT NULL AUTO_INCREMENT,

        course_name VARCHAR(50) NOT NULL,

        PRIMARY KEY (course_id)

);

```

```
INSERT INTO courses(course_name)
VALUES("Btech"),
("BCA"),
("MBA");
```

## ALTER Examples

```
ALTER TABLE students
ADD Email varchar(255);
```

```
ALTER TABLE students
MODIFY Email varchar(255)
AFTER name;
```

```
ALTER TABLE students
MODIFY Email INT(10);
```

```
ALTER TABLE students
ADD UNIQUE (Email);
```

```
ALTER TABLE students
CHANGE Email Email_id carchar(255);
```

```
ALTER TABLE students
DROP COLUMN Email_id;
```

```
ALTER TABLE students
```



```
RENAME studentss;
```

```
ALTER TABLE studentss
```

```
RENAME students;
```

```
ALTER TABLE courses
```

```
AUTO_INCREMENT = 4;
```

## MySQL DROP & TRUNCATE

create table "students" and insert records

```
CREATE TABLE students(
```

```
    id INT NOT NULL,
```

```
    name VARCHAR(50) NOT NULL,
```

```
    age INT NOT NULL,
```

```
    gender VARCHAR(1) NOT NULL,
```

```
    city INT NOT NULL,
```

```
    courses INT NOT NULL,
```

```
    PRIMARY KEY (id),
```

```
    FOREIGN KEY (city) REFERENCES City (cid),
```

```
    FOREIGN KEY (courses) REFERENCES Courses (course_id)
```

```
);
```

```
INSERT INTO students(id,name,age,gender,city,courses)
```

```
VALUES
```

```
(1,"Ram Kumar","19","M",1,1),
```

```
(2,"Sarita Kumari","22","F",2,2),
```

```
(3,"Salman Khan","20","M",1,1),
```

```
(4,"Juhi Chawla","18","F",3,3),  
(5,"Anil Kapoor","22","M",1,3),  
(6,"John Abraham","21","M",2,2),  
(7,"Shahid Kapoor","20","M",1,1);
```

create table "city" and insert records

```
CREATE TABLE city(  
    cid INT NOT NULL AUTO_INCREMENT,  
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);
```

```
INSERT INTO city(cityname)  
VALUES("Agra"),  
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

create table "courses" and insert records

```
CREATE TABLE courses(  
    course_id INT NOT NULL AUTO_INCREMENT,  
    course_name VARCHAR(50) NOT NULL,  
    PRIMARY KEY (course_id)  
);
```

```
INSERT INTO courses(course_name)
VALUES("Btech"),
("BCA"),
("MBA")
("BA")
("BCOM");
```

## DROP & TRUNCATE

```
TRUNCATE TABLE courses;
```

```
DROP TABLE courses;
```

## MySQL VIEW

create table "students" and insert records

```
CREATE TABLE students(
    id INT NOT NULL,
    name VARCHAR(50) NOT NULL,
    percentage INT NOT NULL,
    dob DATE NOT NULL,
    age INT NOT NULL,
    gender VARCHAR(1) NOT NULL,
    city INT NOT NULL,
    courses INT NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY (city) REFERENCES City (cid),
    FOREIGN KEY (courses) REFERENCES Courses (course_id)
);
```

```
INSERT INTO students(id,name,percentage,dob,age,gender,city,courses)
VALUES
(1,"Ram Kumar","45","2000-05-10","19","M",1,1),
(2,"Sarita Kumari","85","1997-02-03","22","F",2,2),
(3,"Salman Khan","29","1999-11-12","20","M",1,1),
(4,"Juhi Chawla","47","2001-07-16","18","F",3,1),
(5,"Anil Kapoor","74","1997-01-03","22","M",1,3),
(6,"John Abraham","64","1998-08-10","21","M",2,2),
(7,"Shahid Kapoor","62","1999-12-08","20","M",1,3);
```

create table "courses" and insert records

```
CREATE TABLE courses(
    course_id INT NOT NULL AUTO_INCREMENT,
    course_name VARCHAR(50) NOT NULL,
    PRIMARY KEY (course_id)
);
```

```
INSERT INTO courses(course_name)
VALUES("Btech"),
("BCA"),
("MBA");
```

create table "city" and insert records

```
CREATE TABLE city(
    cid INT NOT NULL AUTO_INCREMENT,
```

```
    cityname VARCHAR(50) NOT NULL,  
    PRIMARY KEY (cid)  
);
```

```
INSERT INTO city(cityname)  
VALUES("Agra"),  
("Delhi"),  
("Bhopal"),  
("Jaipur"),  
("Noida");
```

## VIEW Examples

```
/* Create view */  
  
CREATE VIEW studentdata  
  
AS  
  
SELECT id,name,course_name FROM students s  
INNER JOIN courses c ON s.courses = c.course_id;
```

```
/* show view */  
  
SELECT * FROM studentdata;
```

```
/* Alter view */  
  
ALTER VIEW studentdata  
  
AS
```

```
SELECT id,name,course_name,cityname FROM students s
INNER JOIN courses c ON s.courses = c.course_id
INNER JOIN city ci ON s.city = ci.cid;
```

```
/* Another way to alter */
```

```
CREATE OR REPLACE VIEW studentdata
```

```
AS
```

```
SELECT id,name,course_name,cityname FROM students s
INNER JOIN courses c ON s.courses = c.course_id
INNER JOIN city ci ON s.city = ci.cid;
```

```
/* rename view */
```

```
RENAME TABLE studentdata
```

```
TO studentcourse;
```

```
/* show view */
```

```
SELECT * FROM studentcourse;
```

```
/* Delete/Drop view */
```

```
DROP VIEW studentcourse;
```

## MySQL INDEX

create table "students" and insert records

```
CREATE TABLE students(
```

```
    id INT NOT NULL,
```

```

    name VARCHAR(50) NOT NULL,
    percentage INT NOT NULL,
    dob DATE NOT NULL,
    age INT NOT NULL,
    gender VARCHAR(1) NOT NULL,
    city INT NOT NULL,
    courses INT NOT NULL,
    PRIMARY KEY (id),
    FOREIGN KEY (city) REFERENCES City (cid),
    FOREIGN KEY (courses) REFERENCES Courses (course_id)
);

INSERT INTO students(id,name,percentage,dob,age,gender,city,courses)
VALUES
(1,"Ram Kumar","45","2000-05-10","19","M",1,1),
(2,"Sarita Kumari","85","1997-02-03","22","F",2,2),
(3,"Salman Khan","29","1999-11-12","20","M",1,1),
(4,"Juhi Chawla","47","2001-07-16","18","F",3,1),
(5,"Anil Kapoor","74","1997-01-03","22","M",1,3),
(6,"John Abraham","64","1998-08-10","21","M",2,2),
(7,"Shahid Kapoor","62","1999-12-08","20","M",1,3);

```

## INDEX Examples

```

SELECT * FROM students
WHERE dob > "1999-01-01";

```

```
/* create index*/  
CREATE INDEX studdob ON students (dob);
```

```
/* show index */  
SHOW INDEX FROM students;
```

```
/* delete index */  
DROP INDEX studdob ON students;
```