SQL - MySQL

Database 

Database is collection of data in a format that can be easily accessed (Digital)

A software application used to manage our DB is called DBMS (Database Management System)

Types of Databases

Relational

Data stored in tables

Non-relational (NoSQL)

data not stored in tables

** We use SQL to work with relational DBMS

What is SQL?

Structured Query Language

SQL is a programming language used to interact with relational databases.

It is used to perform **CRUD** operations :

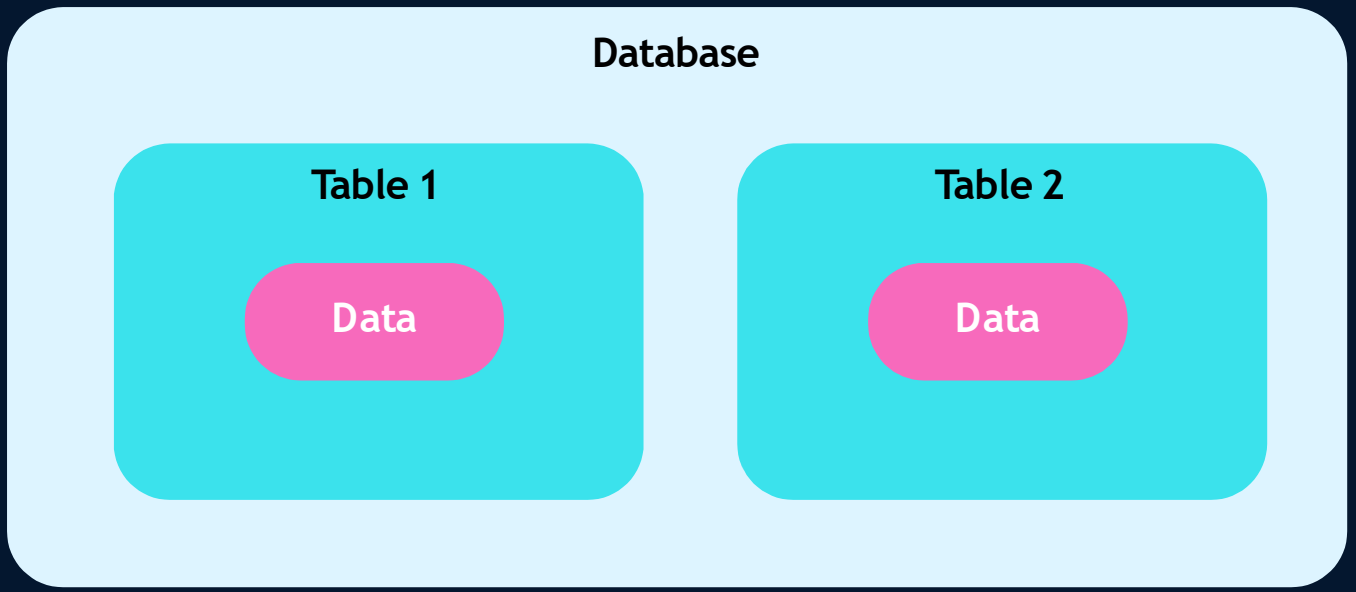
Create

Read

Update

Delete

Database Structure



What is a table?

Student table

RollNo	Name	Class	DOB	Gender	City	Marks
1	Nanda	X	1995-06-06	M	Agra	551
2	Saurabh	XII	1993-05-07	M	Mumbai	462
3	Sonal	XI	1994-05-06	F	Delhi	400
4	Trisla	XII	1995-08-08	F	Mumbai	450
5	Store	XII	1995-10-08	M	Delhi	369
6	Marisla	XI	1994-12-12	F	Dubai	250
7	Neha	X	1995-12-08	F	Moscow	377
8	Nishant	X	1995-06-12	M	Moscow	489

Creating our First Database

Our first SQL Query

```
CREATE DATABASE db_name;
```

```
DROP DATABASE db_name;
```

Creating our First Table

```
USE db_name;

CREATE TABLE table_name (
    column_name1 datatype constraint,
    column_name2 datatype constraint,
    column_name2 datatype constraint
);
```

```
CREATE TABLE student (
    id INT PRIMARY KEY,
    name VARCHAR(50),
    age INT NOT NULL
);
```

SQL Datatypes

They define the type of values that can be stored in a column

DATATYPE	DESCRIPTION	USAGE
CHAR	string(0-255), can store characters of fixed length	CHAR(50)
VARCHAR	string(0-255), can store characters up to given length	VARCHAR(50)
BLOB	string(0-65535), can store binary large object	BLOB(1000)
INT	integer(-2,147,483,648 to 2,147,483,647)	INT
TINYINT	integer(-128 to 127)	TINYINT
BIGINT	integer(-9,223,372,036,854,775,808 to 9,223,372,036,854,775,807)	BIGINT
BIT	can store x-bit values. x can range from 1 to 64	BIT(2)
FLOAT	Decimal number - with precision to 23 digits	FLOAT
DOUBLE	Decimal number - with 24 to 53 digits	DOUBLE
BOOLEAN	Boolean values 0 or 1	BOOLEAN
DATE	date in format of YYYY-MM-DD ranging from 1000-01-01 to 9999-12-31	DATE
YEAR	year in 4 digits format ranging from 1901 to 2155	YEAR

SQL Datatypes

Signed & Unsigned

TINYINT UNSIGNED (0 to 255)

TINYINT (-128 to 127)

Types of SQL Commands

DDL (Data Definition Language) : create, alter, rename, truncate & drop

DQL (Data Query Language) : select

DML (Data Manipulation Language) : select, insert, update & delete

DCL (Data Control Language) : grant & revoke permission to users

TCL (Transaction Control Language) : start transaction, commit, rollback etc.

Database related Queries

CREATE DATABASE *db_name;*

CREATE DATABASE IF NOT EXISTS *db_name;*

```
CREATE DATABASE IF NOT EXISTS college;
```

DROP DATABASE *db_name;*

DROP DATABASE IF EXISTS *db_name;*

SHOW DATABASES;

SHOW TABLES;

Table related Queries

Create

CREATE TABLE *table_name (*
    column_name1 datatype constraint,
    column_name2 datatype constraint,
);

```
CREATE TABLE student (
  rollno INT PRIMARY KEY,
  name VARCHAR(50)
);
```

Table related Queries

Select & View ALL columns

SELECT * FROM *table_name;*

```
SELECT * FROM student;
```

Table related Queries

Insert

INSERT INTO *table_name*
(colname1, colname2);
VALUES
(col1_v1, col2_v1),
(col1_v2, col2_v2);

```
INSERT INTO student
(rollno, name)
VALUES
(101, "karan"),
(102, "arjun");
```

Keys

Primary Key

It is a column (or set of columns) in a table that uniquely identifies each row. (a unique id)

There is only 1 PK & it should be NOT null.

Foreign Key

A foreign key is a column (or set of columns) in a table that refers to the primary key in another table.

There can be multiple FKs.

FKs can have duplicate & null values.

Keys

table1 - Student

id	name	cityId	city
101	karan	1	Pune
102	arjun	2	Mumbai
103	ram	1	Pune
104	shyam	3	Delhi

table2 - City

id	city_name
1	Pune
2	Mumbai
3	Delhi

Constraints

SQL constraints are used to specify rules for data in a table.

NOT NULL columns cannot have a null value

```
col1 int NOT NULL
```

UNIQUE all values in column are different

```
col2 int UNIQUE
```

PRIMARY KEY makes a column unique & not null but used only for one

```
id int PRIMARY KEY
```

```
CREATE TABLE temp (
  id int not null,
  PRIMARY KEY (id)
);
```

Constraints

FOREIGN KEY prevent actions that would destroy links between tables

```
CREATE TABLE temp (
  cust_id int,
  FOREIGN KEY (cust_id) references customer(id)
);
```

DEFAULT sets the default value of a column

```
salary INT DEFAULT 25000
```

Constraints

CHECK it can limit the values allowed in a column

```
CREATE TABLE city (
  id INT PRIMARY KEY,
  city VARCHAR(50),
  age INT,
  CONSTRAINT age_check CHECK (age >= 18 AND city="Delhi")
);
```

```
CREATE TABLE newTab (
  age INT CHECK (age >= 18)
);
```