

MySQL Tutorial

MySQL is a widely used relational database management system (RDBMS).

MySQL is free and open-source.

MySQL is ideal for both small and large applications.

Introduction to MySQL

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

What is RDBMS?

RDBMS stands for Relational Database Management System.

RDBMS is a program used to maintain a relational database.

RDBMS is the basis for all modern database systems such as MySQL, Microsoft SQL Server, Oracle, and Microsoft Access.

RDBMS uses [SQL queries](#) to access the data in the database.

What is a Database Table?

A table is a collection of related data entries, and it consists of columns and rows.

A column holds specific information about every record in the table.

A record (or row) is each individual entry that exists in a table.

Look at a selection from the Northwind "Customers" table:

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK

The columns in the "Customers" table above are: CustomerID, CustomerName, ContactName, Address, City, PostalCode and Country. The table has 4 records (rows).

What is a Relational Database?

A relational database defines database relationships in the form of tables. The tables are related to each other - based on data common to each.

Look at the following three tables "Customers", "Orders", and "Shippers" from the Northwind database:

Customers Table

CustomerID	CustomerName	ContactName	Address	City	PostalCode	Country
1	Alfreds Futterkiste	Maria Anders	Obere Str. 57	Berlin	12209	Germany
2	Ana Trujillo Emparedados y helados	Ana Trujillo	Avda. de la Constitución 2222	México D.F.	05021	Mexico
3	Antonio Moreno Taquería	Antonio Moreno	Mataderos 2312	México D.F.	05023	Mexico
4	Around the Horn	Thomas Hardy	120 Hanover Sq.	London	WA1 1DP	UK
5	Berglunds snabbköp	Christina Berglund	Berguvsvägen 8	Luleå	S-958 22	Sweden

The relationship between the "Customers" table and the "Orders" table is the CustomerID column:

Orders Table

OrderID	CustomerID	EmployeeID	OrderDate	ShipperID
10278	5	8	1996-08-12	2
10280	5	2	1996-08-14	1
10308	2	7	1996-09-18	3
10355	4	6	1996-11-15	1
10365	3	3	1996-11-27	2
10383	4	8	1996-12-16	3
10384	5	3	1996-12-16	3

The relationship between the "Orders" table and the "Shippers" table is the ShipperID column:

Shippers Table

ShipperID	ShipperName	Phone
1	Speedy Express	(503) 555-9831
2	United Package	(503) 555-3199
3	Federal Shipping	(503) 555-9931

MySQL SQL

What is SQL (Structured Query Language)?

SQL is the standard language for dealing with Relational Databases.

SQL is used to insert, search, update, and delete database records.

How to Use SQL

The following SQL statement selects all the records in the "Customers" table:

```
SELECT * FROM Customers;
```

Keep in Mind That...

- SQL keywords are NOT case sensitive: `select` is the same as `SELECT`

In this tutorial we will write all SQL keywords in upper-case.

Semicolon after SQL Statements?

Some database systems require a semicolon at the end of each SQL statement.

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.

In this tutorial, we will use semicolon at the end of each SQL statement.

Some of The Most Important SQL Commands

- `SELECT` - extracts data from a database
- `UPDATE` - updates data in a database
- `DELETE` - deletes data from a database
- `INSERT INTO` - inserts new data into a database
- `CREATE DATABASE` - creates a new database
- `ALTER DATABASE` - modifies a database
- `CREATE TABLE` - creates a new table
- `ALTER TABLE` - modifies a table
- `DROP TABLE` - deletes a table
- `CREATE INDEX` - creates an index (search key)
- `DROP INDEX` - deletes an index

Create Database and Table as like following

Server: 127.0.0.1 » Database: 9211_2324 » Table: students

Browse

Structure

SQL

Search

Insert

Export

Import

Privileges

Operations

Tracking

Triggers

Table structure

Relation view

	#	Name	Type	Collation	Attributes	Null	Default	Comments	Extra	Action
<input type="checkbox"/>	1	roll	int(11)			No	None		AUTO_INCREMENT	Change Drop More
<input type="checkbox"/>	2	fname	varchar(20)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	3	lname	varchar(20)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	4	city	varchar(20)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	5	email	varchar(128)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	6	phone	varchar(15)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	7	gender	varchar(10)	utf8mb4_general_ci		No	None			Change Drop More
<input type="checkbox"/>	8	dateofbirth	date			No	None			Change Drop More
<input type="checkbox"/>	9	admissiondata	timestamp			No	current_timestamp()			Change Drop More

Console

And add some data as following

Server: 127.0.0.1 » Database: 9211_2324 » Table: students

Browse

Structure

SQL

Search

Insert

Export

Import

Privileges

Operations

Tracking

		roll	fname	lname	city	email	phone	gender	dateofbirth	admissiondata
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	1	hetvi	Maheswari	Morbi	hetvi@gmail.com	8787678678	female	2004-02-14	2024-02-14 10:03:04
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	2	kenil	sangani	Rajkot	kenil@gmail.com	2457834578	male	2004-02-13	2024-02-14 10:04:10
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	3	ridham	vishnuswami	Ahamdabad	ridham@gmail.com	989898989	male	2005-02-12	2024-02-14 10:04:10
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	4	bhalabhai	bavaliya	Rajkot	bhalabhai@gmail.com	2457834578	male	2004-02-13	2024-02-14 10:04:51
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	5	sumit	talsaniya	Ahamdabad	sumit@gmail.com	989898989	male	2005-02-12	2024-02-14 10:04:51
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	6	het	dadhaniya	Rajkot	het@gmail.com	2457834578	male	2004-02-13	2024-02-14 10:05:28
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	7	deepak	vavdiya	Ahamdabad	deepak@gmail.com	989898989	male	2005-02-12	2024-02-14 10:05:28
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	8	dhrumil	nathani	Rajkot	dhrumin@gmail.com	2457834578	male	2004-02-13	2024-02-14 10:06:01
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	9	sujal	khachariya	Ahamdabad	sujal@gmail.com	989898989	male	2005-02-12	2024-02-14 10:06:01
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	10	riya	barad	Rajkot	riya@gmail.com	2457834578	female	2004-02-13	2024-02-14 10:06:40
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	11	khushi	thakar	Ahamdabad	khushi@gmail.com	989898989	female	2005-02-12	2024-02-14 10:06:40
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	12	hasti	vala	Rajkot	hasti@gmail.com	2457834578	female	2004-02-13	2024-02-14 10:07:22
<input type="checkbox"/>	<div><div><div></div><div>Edit</div></div><div><div></div><div>Copy</div></div><div><div></div><div>Delete</div></div></div>	13	priya	thakar	Ahamdabad	priya@gmail.com	989898989	female	2005-02-12	2024-02-14 10:07:22

MySQL SELECT Statement

The MySQL SELECT Statement

The `SELECT` statement is used to select data from a database.

The data returned is stored in a result table, called the result-set.

SELECT Syntax

`SELECT column1, column2, ... FROM table_name;`

Here, column1, column2, ... are the field names of the table you want to select data from. If you want to select all the fields available in the table, use the following syntax:

`SELECT * FROM table_name;`

`SELECT * from students;`

`SELECT roll, fname, lname, city from students`

The MySQL SELECT DISTINCT Statement

The `SELECT DISTINCT` statement is used to return only distinct (different) values.

Inside a table, a column often contains many duplicate values; and sometimes you only want to list the different (distinct) values.

SELECT DISTINCT Syntax

`SELECT DISTINCT column1, column2, ... FROM table_name;`

`SELECT city from students;`

`SELECT DISTINCT city from students;`

The following SQL statement counts and returns the number of different (distinct) city in the "Students" table:

`SELECT count(DISTINCT city) from students;`

MySQL WHERE Clause

The MySQL WHERE Clause

The `WHERE` clause is used to filter records.

It is used to extract only those records that fulfill a specified condition.

WHERE Syntax

`SELECT column1, column2, ...`

`FROM table_name`

`WHERE condition;`

Note: The *WHERE* clause is not only used in *SELECT* statements, it is also used in *UPDATE*, *DELETE*, etc.!

```
SELECT * FROM students WHERE roll = 1
```

```
SELECT * FROM students WHERE roll > 5;
```

```
SELECT * FROM students WHERE not roll > 5;
```

```
SELECT * FROM students WHERE city = 'rajkot';
```

```
SELECT * FROM students WHERE city <> 'rajkot';
```

```
SELECT * FROM students WHERE not city = 'rajkot';
```

```
SELECT * FROM students WHERE roll BETWEEN 1 and 5
```