Beginners Guide

LEARN MySQL

for Absolute Beginners

First Edition

PHPBOOTCAMP.COM

EASY TO PRACTISE CODE SAMPLES

About this Book

MYSQL is a Database Query language that allows web developers to access MySQL database using PHP Libraries. MySQL is database used to store data in table format. This book will help you understand the basics of SQL Language and how to put it in practice to build Websites.

Audience

This tutorial has been designed to meet the requirements of all those readers who are keen to learn the basics of MySQL.

Prerequisites

This book assumes you have no prior knowledge on Programming knowledge and assume you are at a beginner level.

How to use this Book

This book contains SQL Language Basics, Exercises and Examples which are part of the PHP Bootcamp Program. This bootcamp has helped many students to become PHP Full Stack Web Developer in Just 30 days.

>>>Check out more about this program here...

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Table of Contents

1. MySQL BASICS

1 MySQL Basics

1.1 Introduction to Databases and SQL

What is a Database?

A Database is a structured ways of storing the data on your computer so that it can be easy searched, managed and updated.

Data stored in a file are not easy to search because it is not properly organized this is solved by using Database Software.

Database software helps to store the data in such a way that it can retrieved faster. Even Database software has capacity to hold large amount of data.

How Data are stored in Database?

Data in the database are stored in one or more tables. Each tables will have data organized in row and column format.

Sample Marks Table will look like this.

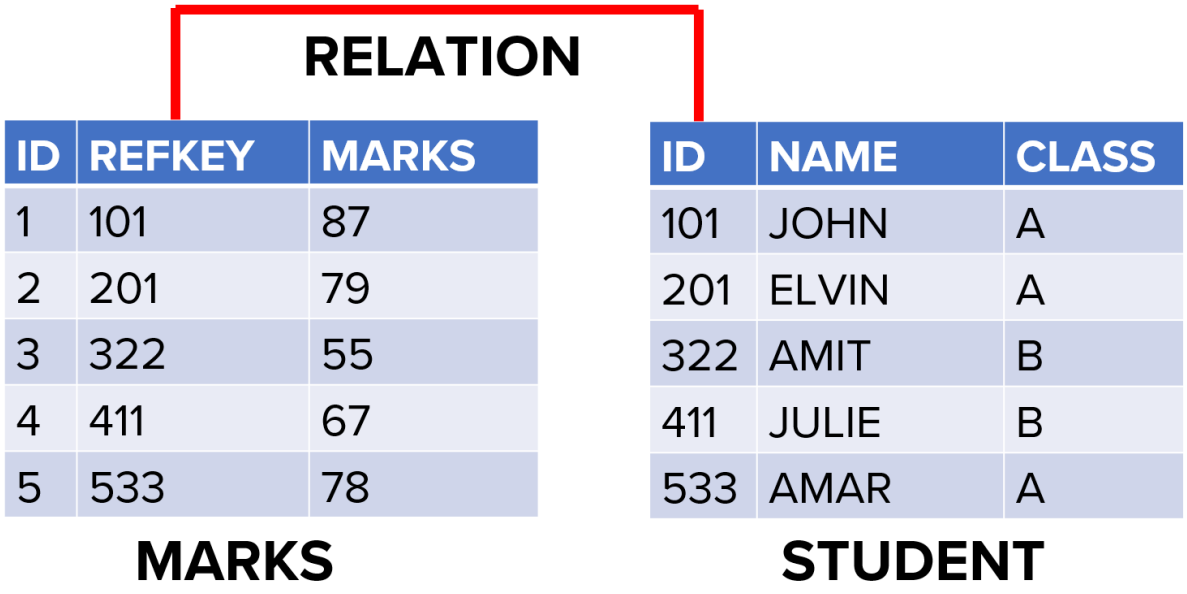
ID	SUBJECT	MARKS
1	MATHS	98
2	SCIENCE	56
3	ENGLISH	45
4	SOCIAL	22
5	COMPUTER	19

Table Name: Marks
ID, SUBJECT and MARKS are called as Columns.
Value on each line are called as Rows.

What is Relational Database?

You can create relation between tables and avoid duplicating the data by using references between the tables.

Student ID Reference is used in Marks Table to make a relation between the tables.



Relationship of tables also helps to break a bigger table structure into small tables and link them.

What is SQL?

SQL Stands for “Structured Query Language” it is a language used to access the data in the database.

SQL is pronounced as ‘S-Q-L’ or ‘sequel’.

SQL Language is predefined with keywords that you can use to do the following things:

Create a Table

Delete a Table

Search Table with Conditions

Insert Rows

Update Rows

Delete Rows

SQL language can be used to perform such actions on the database.

Example:

To delete a table you can say:

DROP TABLE <tablename>

Usage of Database:

Instead of storing the data in files and access them. All the data are stored in the Database.

In a Website you can store the following things:

User Information

Product Information

Product Pricing

Orders

Invoice

Enquiry

Contacts

and many more

Every website uses Database to store its information because it is easy and faster to store and access it.

1.2 What is MySQL?

MySQL is a open source relational database management system which is free to use.

Open source means you can even download its source code and change it for your needs.

Relational Database means you can create relation between the tables when you use MySQL.

Download the MySQL from: https://www.mysql.com/

With MySQL Database Software, you can

- Insert, Update or Delete the data in Tables.
- Query the Database for a specific row based on unique data condition.
- Use SQL language to access the data in the database.
- handle large amount of data.

You have to download the MySQL database to your local machine to start using it.

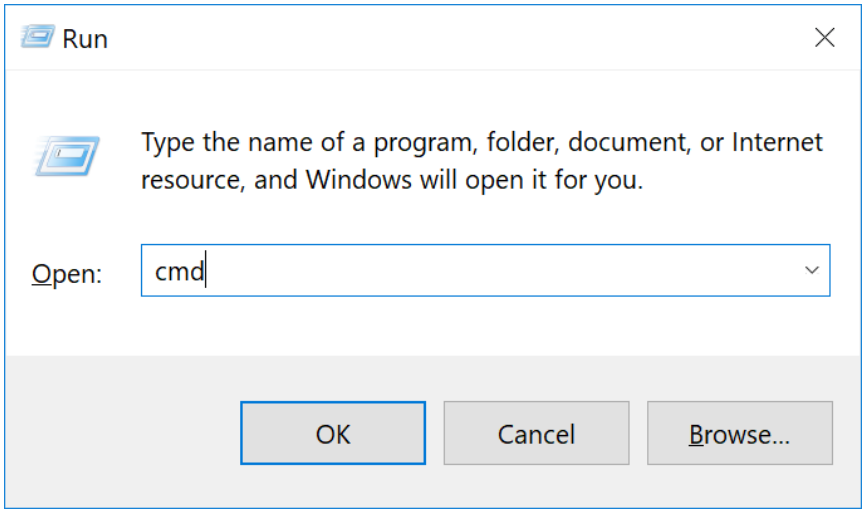
MySQL is under maintenance of Oracle. You can even purchase a license from Oracle for business purpose.

It also runs on various platforms like Linux, Unix and Windows and it works pretty well with PHP because PHP has many libraries to access the MySQL Database.

How to Access the MySQL from Command Line

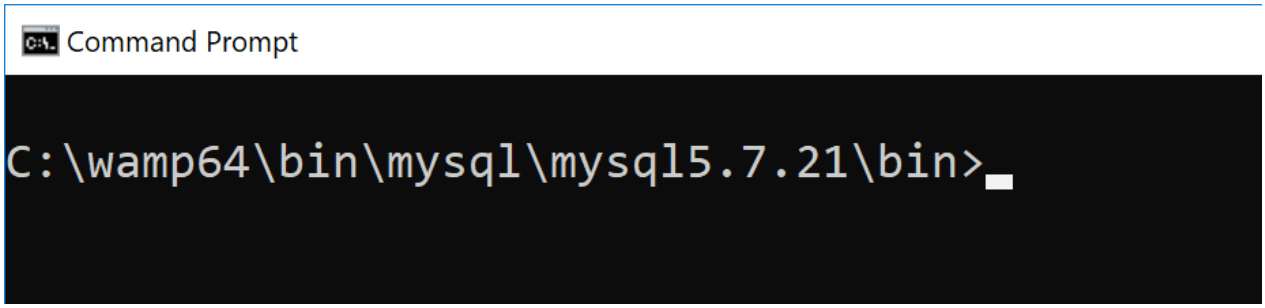
Step 1: Make sure you have installed WAMP Server from this guide.

Step 2: Open Command Line with CMD + R and Type cmd.



Step 3: Go to folder

“cd C:\wamp64\bin\mysql\mysql5.7.21\bin”

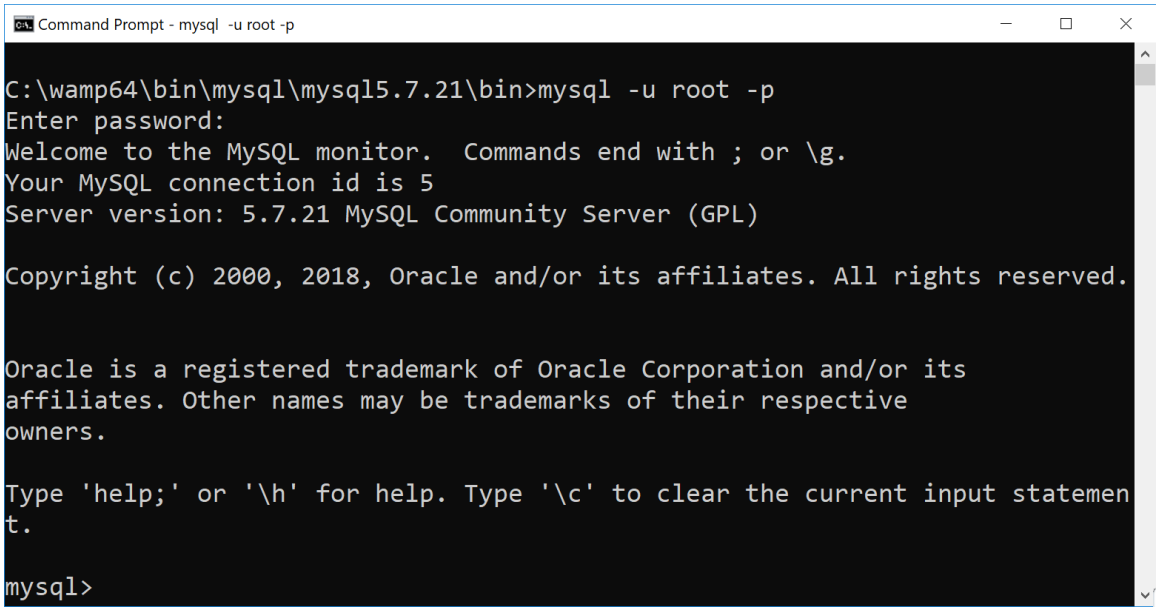


Step 4: Type >**mysql -u root -p**

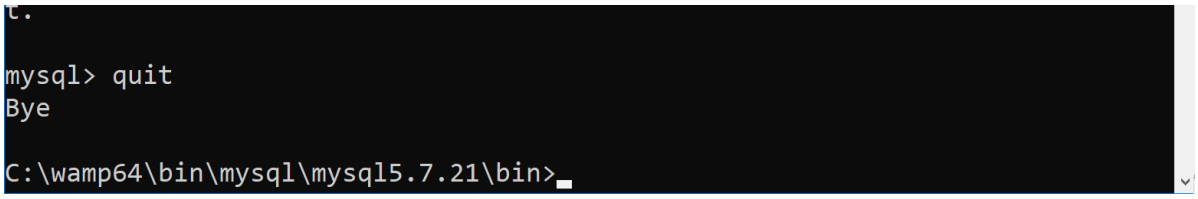
Press enter when it ask for password.

There is no password.

Step 5: This is your MySQL Database



Step 6: Type ‘quit’ to exit.



1.3 What is phpMyAdmin?

How to access the MySQL Database?

Once you install the MySQL database there are three ways to access the database:

- Command Line Client
- Graphical Dashboard called as phpMyAdmin.
- PHP Program

What is phpMyAdmin?

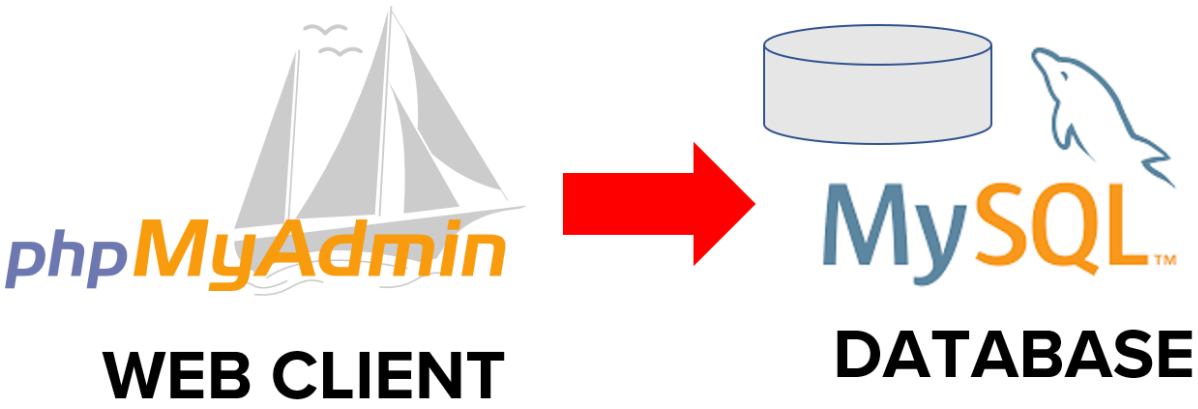
phpMyAdmin is a web based client using which we can access the MySQL Database and Tables.

We can perform the database operations like:

- Creating Users
- Creating Database, Tables
- Inserting, Updating and Deleting the Data

This is a Web based client using which we can perform the database operation on the MySQL.

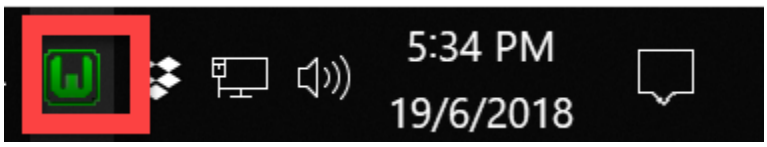
MySQL is the Database and phpMyAdmin is the web Client to access the database.



How to Access the MySQL from phpMyAdmin

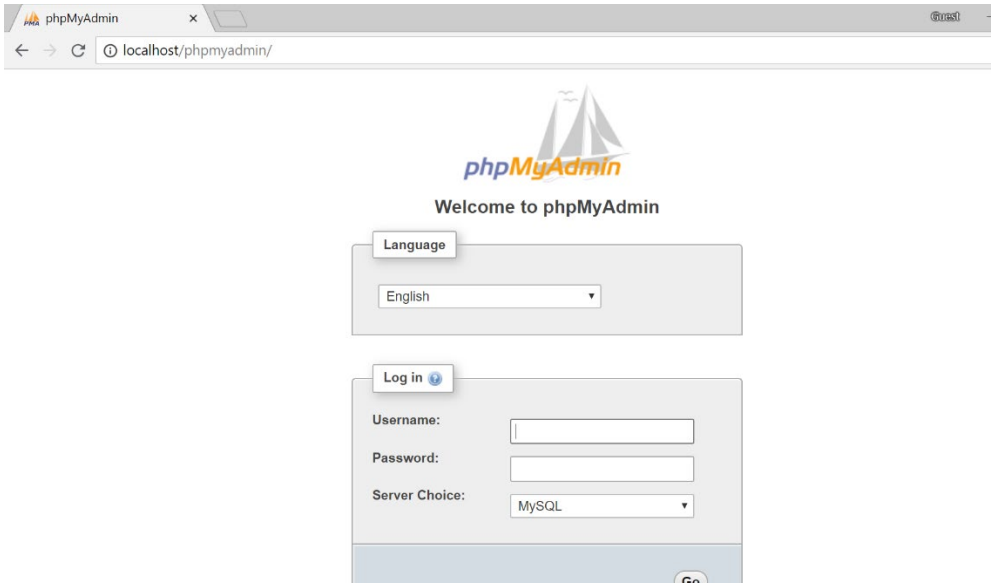
Step 1: Make sure you have installed WAMP Server from this guide.

Step 2: Make sure the WAMP Server is running.

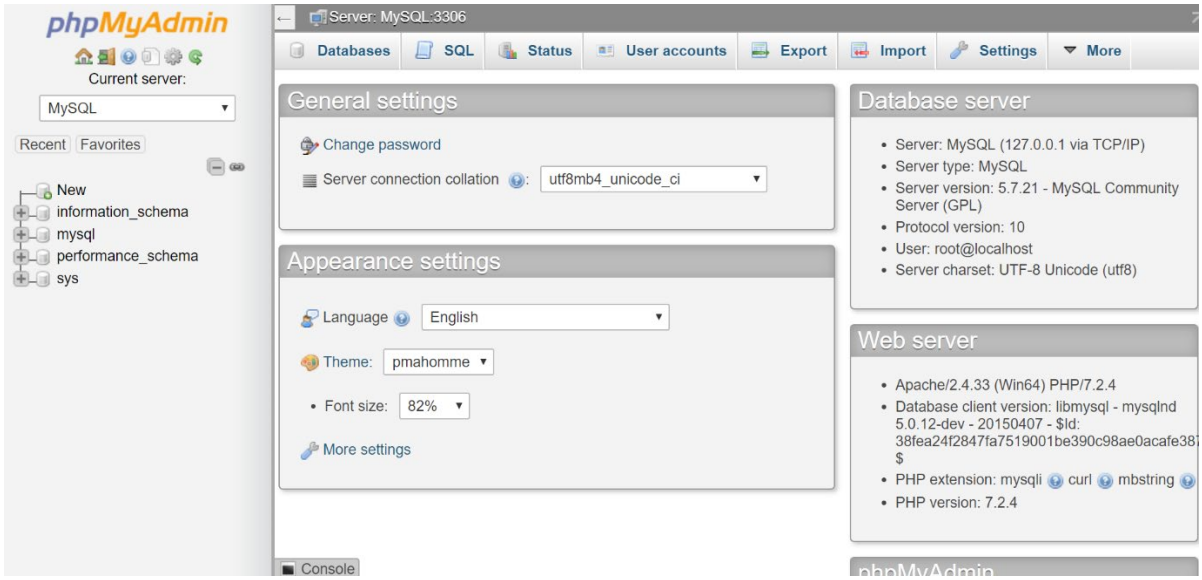


Step 3: Open Browser and type this url

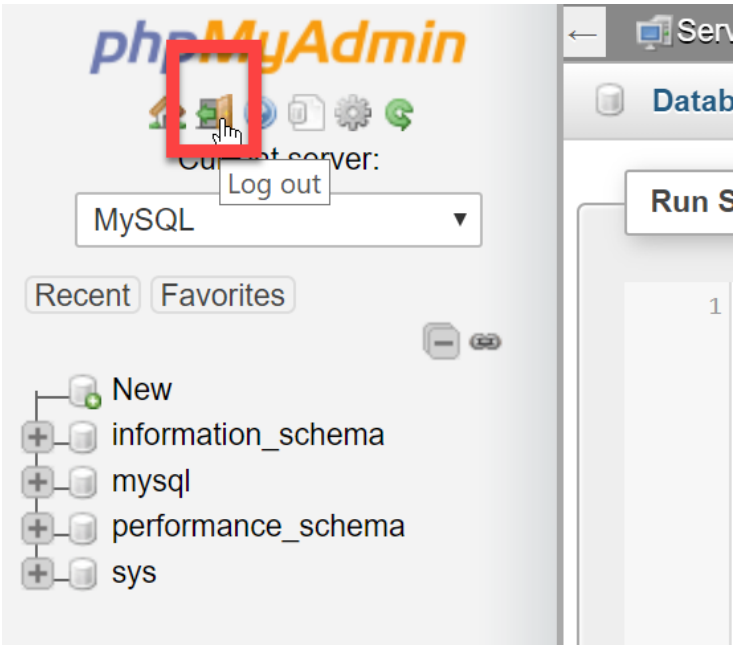
http://localhost/phpmyadmin



Step 4: Username is root and password is blank. Press enter.



Step 5: Press the logout button to exit from the application



1.4 Datatypes MySQL

Datatypes in MySQL are divided into this 3 categories:

- Numeric
- Strings
- Date and Time

Numbers in MySQL are:

- INT
- TINYINT
- SMALLINT
- MEDIUMINT
- BIGINT
- FLOAT
- DOUBLE
- DECIMAL

String in MySQL are:

- CHAR
- VARCHAR
- BLOB (TINYBLOB, MEDIUMBLOB, LONGBLOB)
- TEXT (TINYTEXT, MEDIUMTEXT, LONGTEXT)
- ENUM

Date and Time in MySQL are:

- DATE
- TIME
- DATETIME
- TIMESTAMP

Most Commonly Used Datatypes:

- INT OR FLOAT OR DECIMAL – To Store numbers and decimals
- CHAR OR VARCHAR – To Store String
- DATETIME – To Store Date and Time

1.5 Keywords MySQL

Commonly used Keywords in MySQL SQL Statements:

- SELECT
- INSERT
- UPDATE
- DELETE
- AS
- DROP
- DESC
- TABLE
- DATABASE
- WHERE
- ISNULL
- ORDER BY

Complete list is found here from MySQL

2.phpMyAdmin

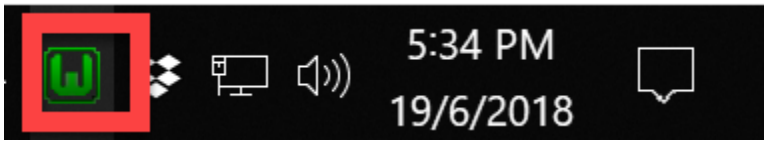
2 phpMyAdmin

2.1 Login and Logout phpMyAdmin

How to Login into phpMyAdmin

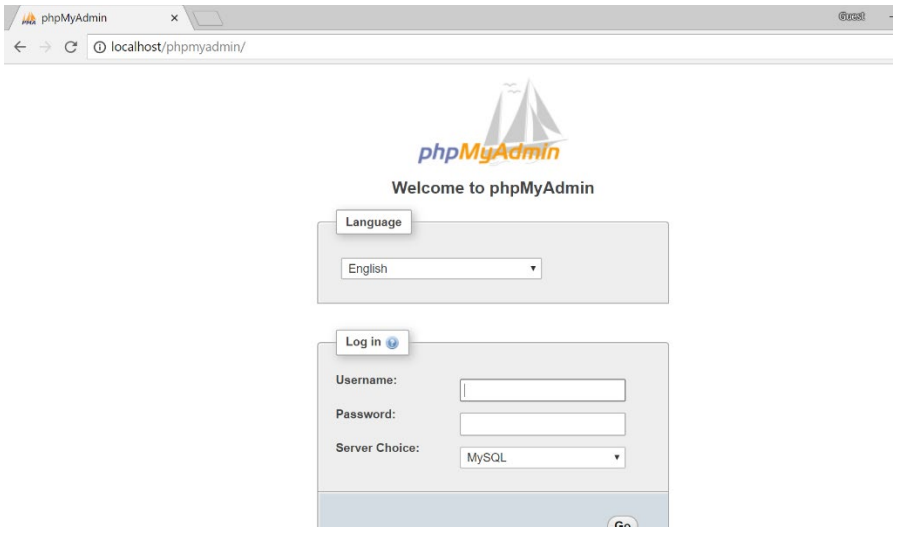
Step 1: Make sure you have installed WAMP Server from this guide.

Step 2: Make sure the WAMP Server is running.

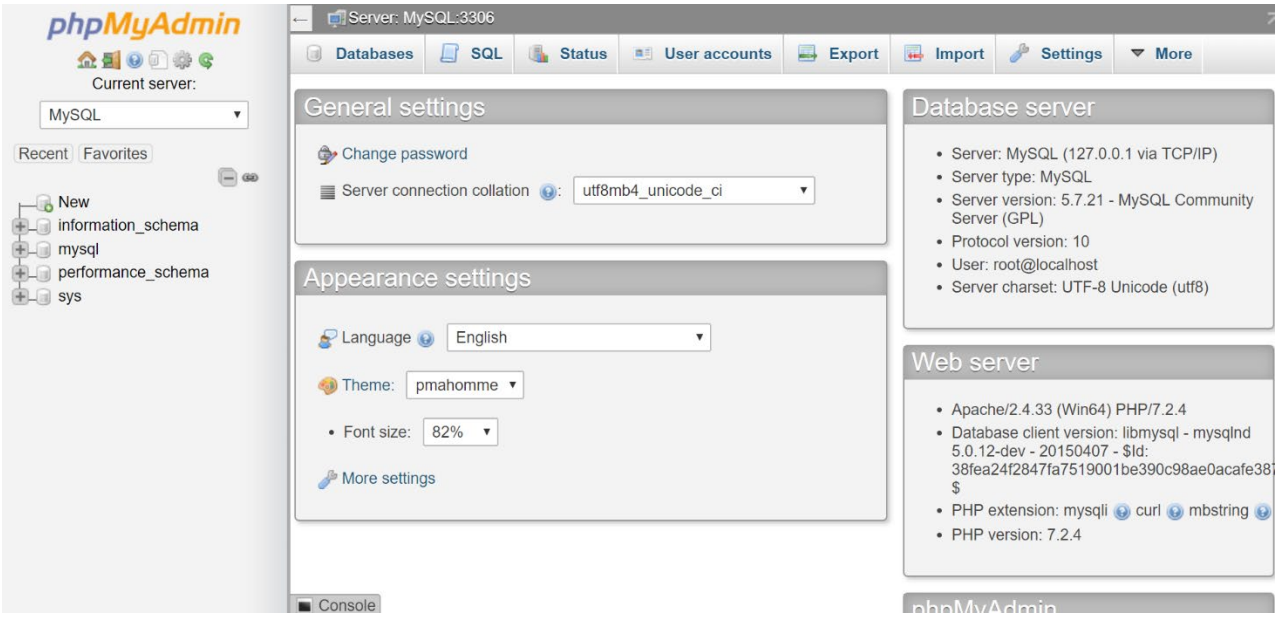


Step 3: Open Browser and type this url

http://localhost/phpmyadmin

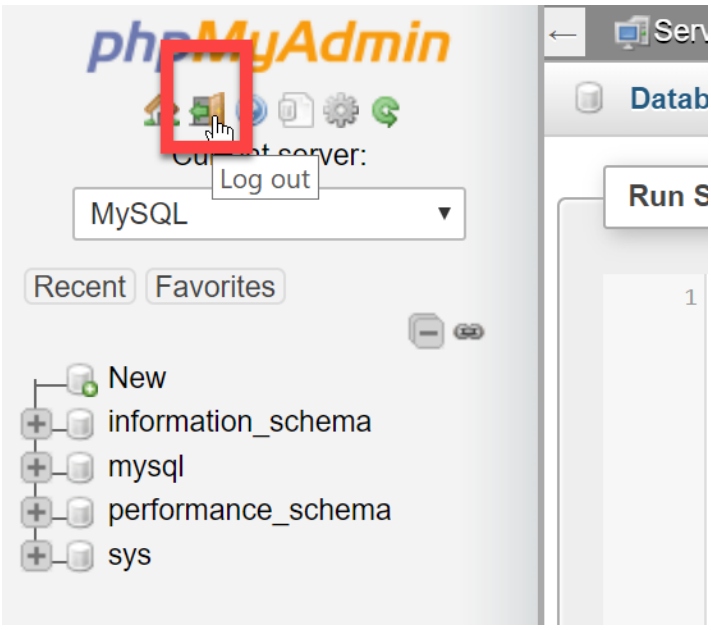


Step 4: Username is root and password is blank. Press enter.



How to Logout from phpMyAdmin

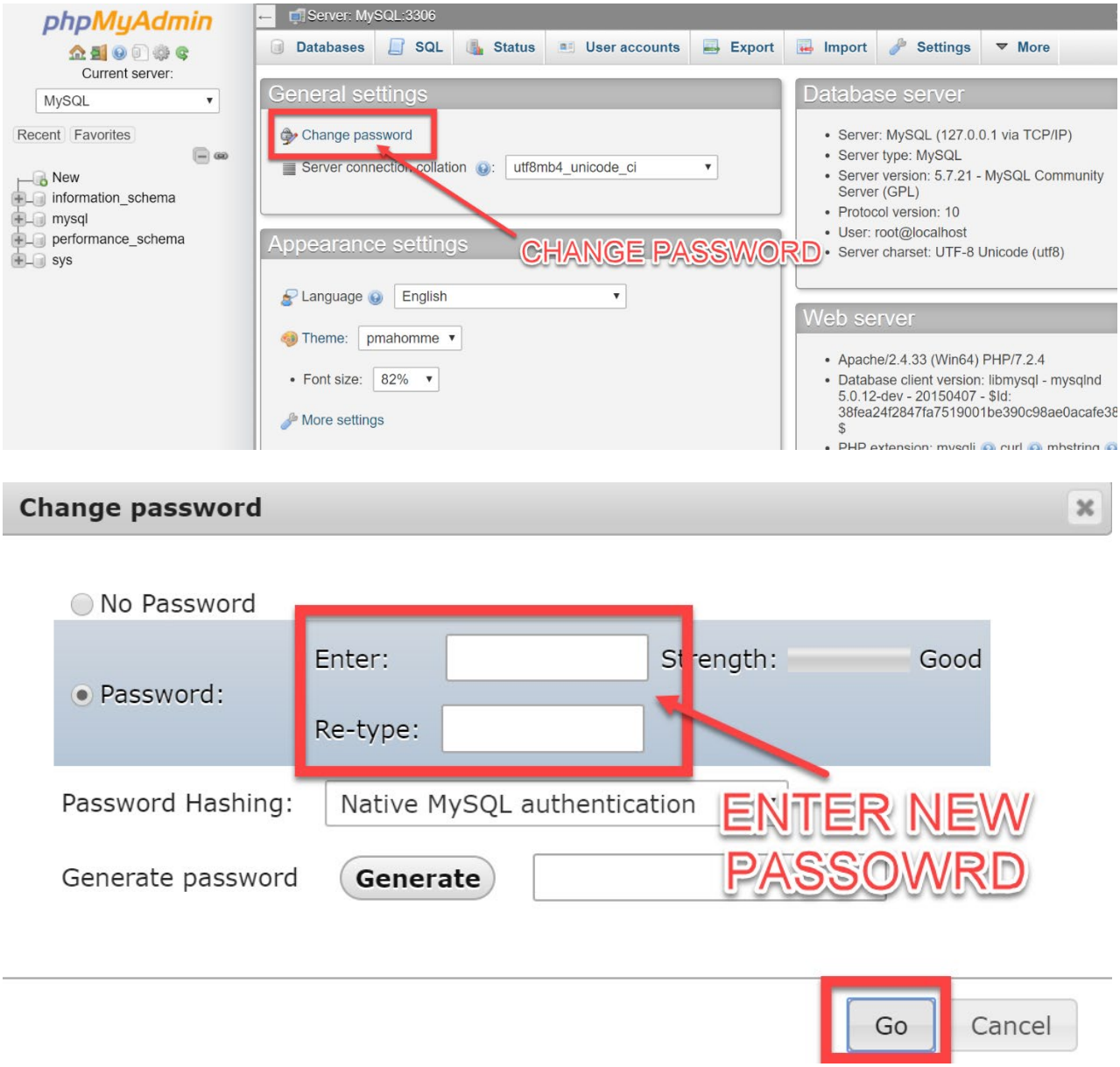
Step 1: Press the logout button to exit from the application



How to Change Password into phpMyAdmin

Step 1: Click on Home Icon 

Step 2: Click on the Change Password.



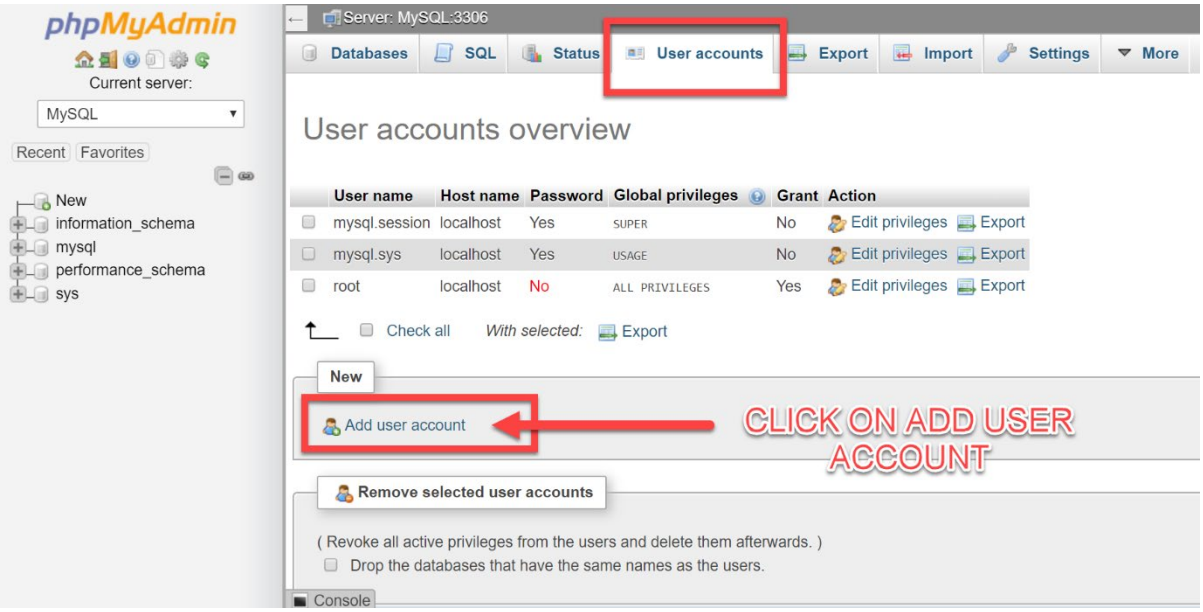
Step 3: After you change password. Login again with the new password.

2.2 Create Users

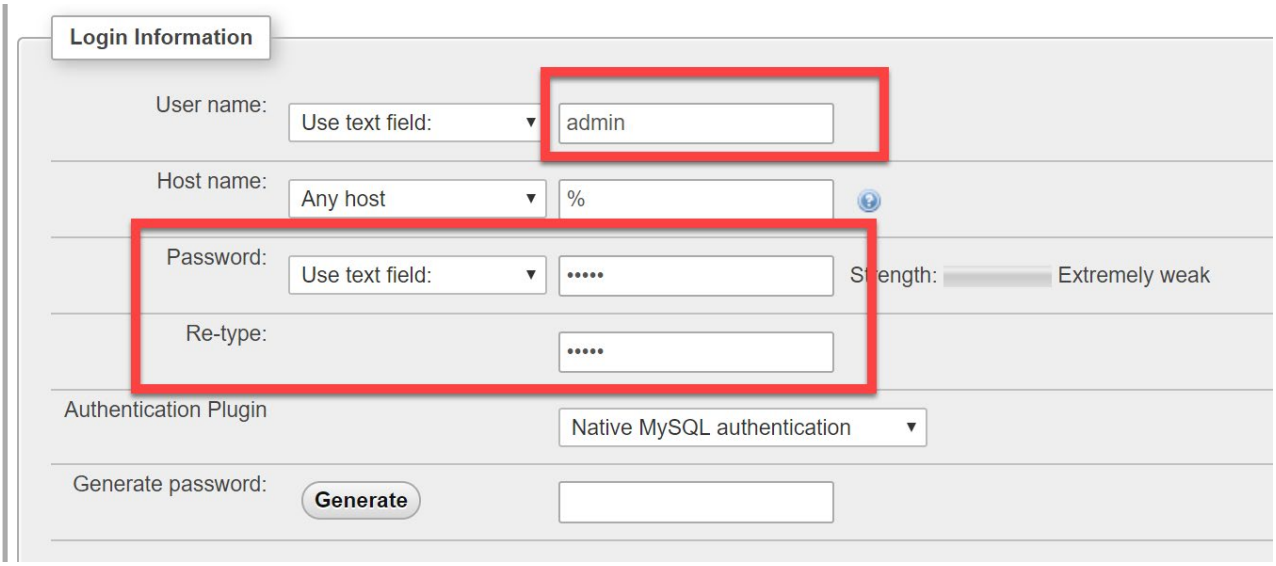
How to Create user with phpMyAdmin

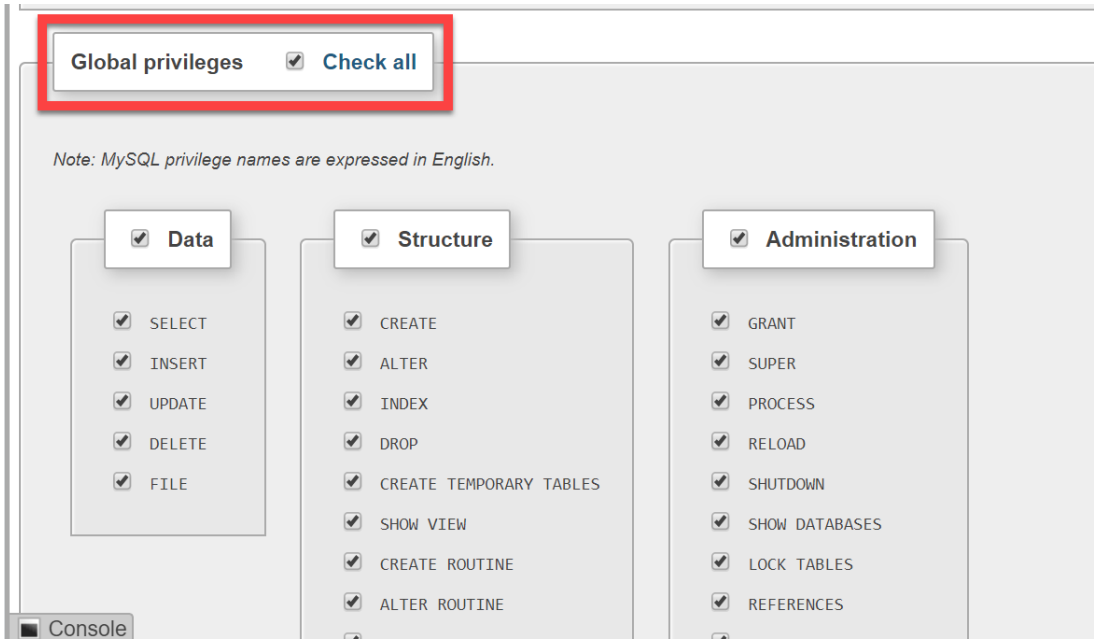
Step 1: Login into phpMyAdmin with the url: http://localhost/phpmyadmin

Step 2: Click on User Accounts -> Add New Account on the Home Page.



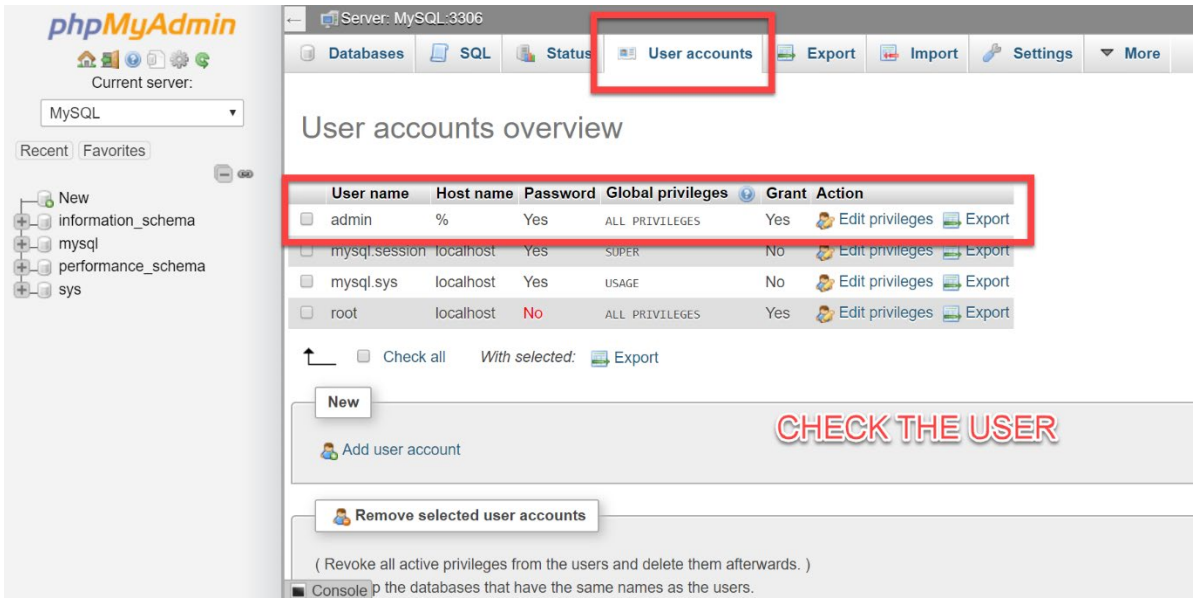
Step 3: Add the Username and Password and click on Global Privileges.



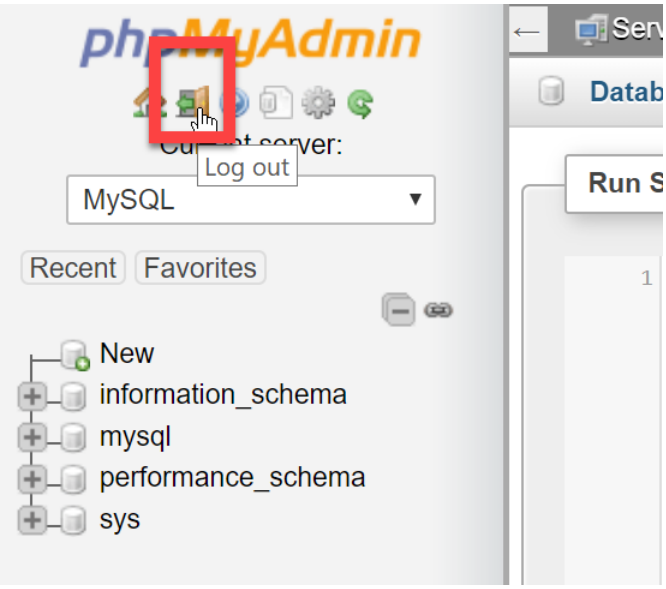


Click on GO Button at the bottom of the page.

Step 4: Check the User Created



Step 5: Press the logout button to exit from the application



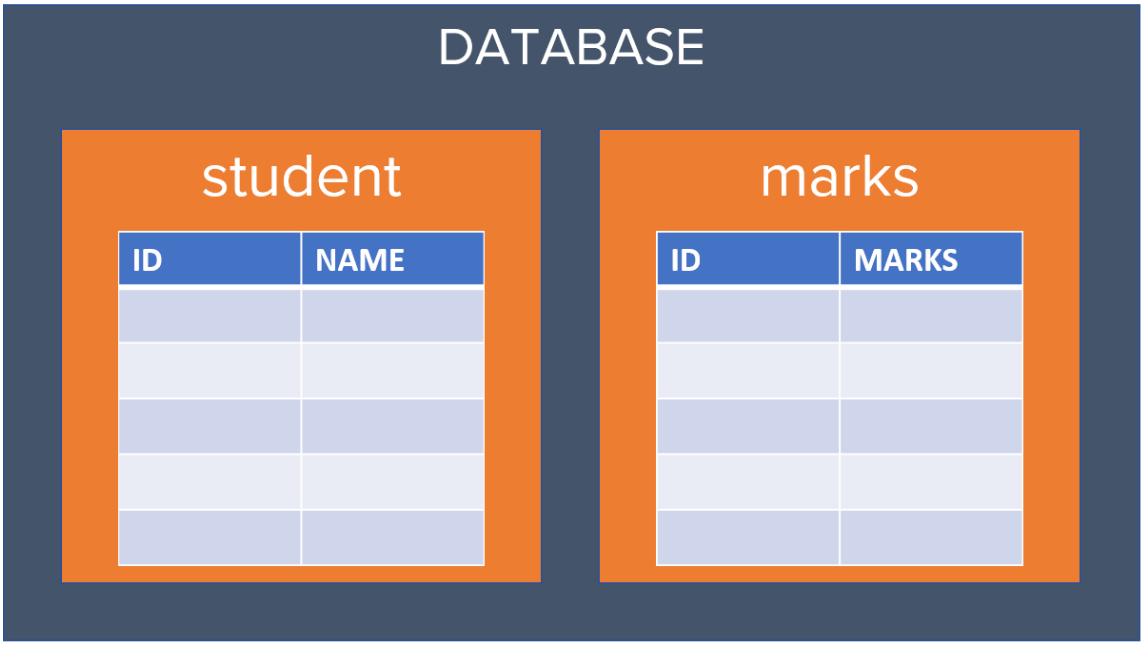
Step 6: Login again with new user credentials.

2.3 Create Database and Table

What is Database & Table?

Database is a collection of Tables. One Database can have multiple tables.

One Table can have defined column and all the data is table are stored in each row.

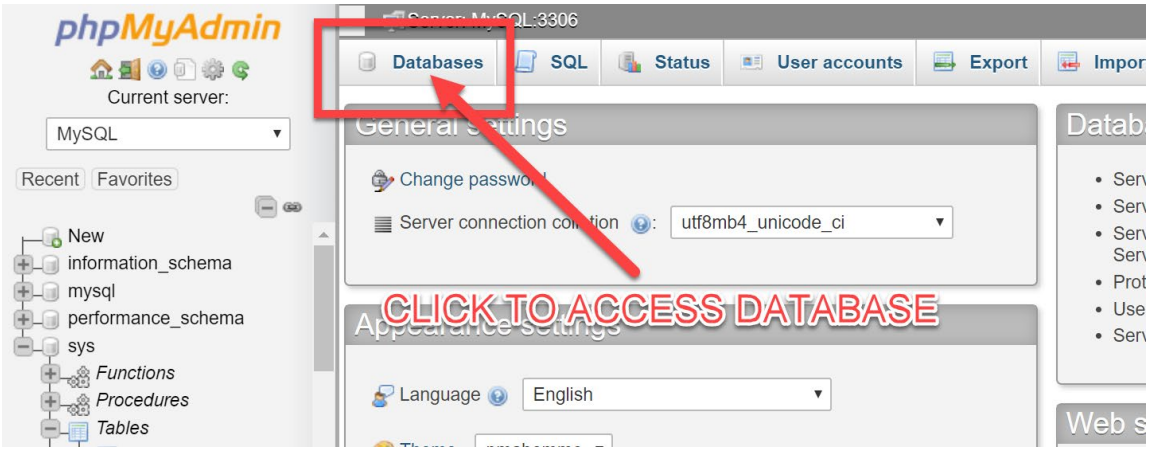


Create Database in phpMyAdmin

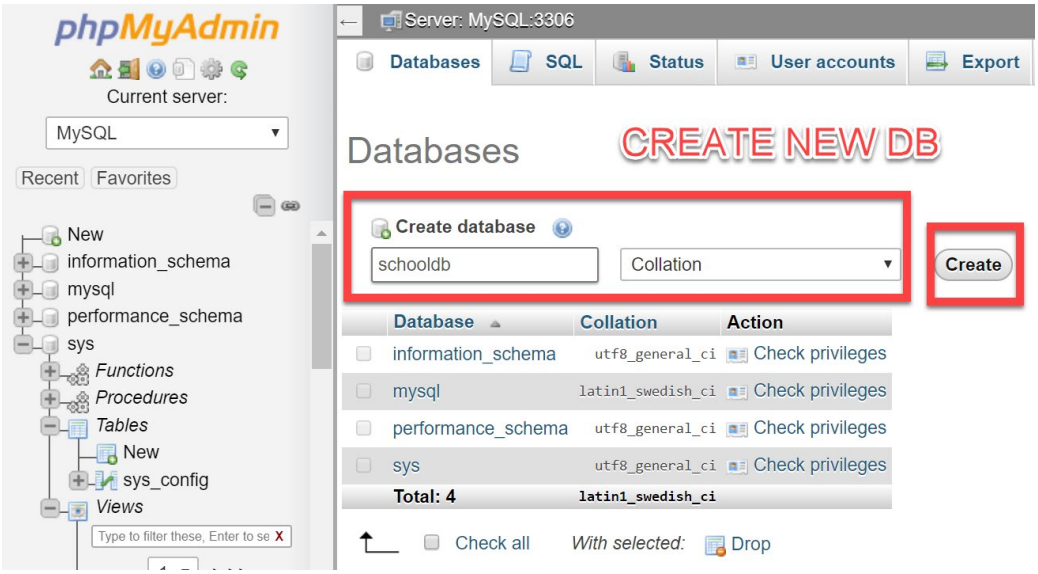
Create Database ‘schooldb’

Step 1: Open the phpMyAdmin Dashboard

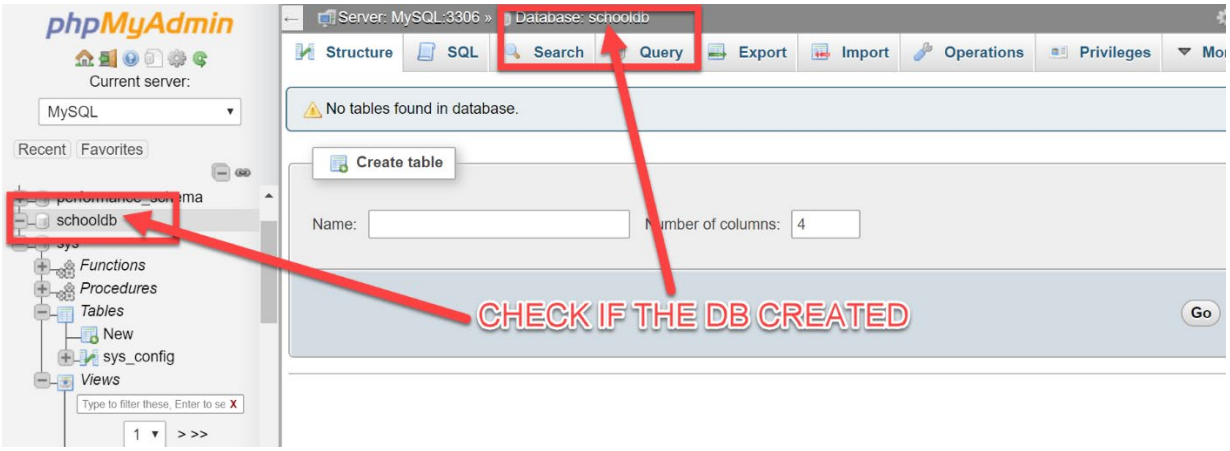
Step 2: Click on Database



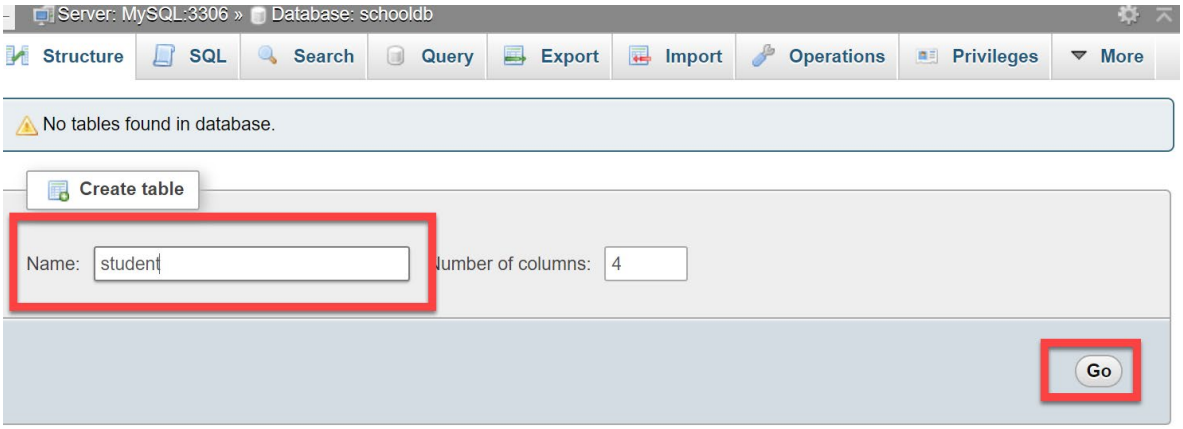
Step 3: Enter the new Database Name – **schooldb**



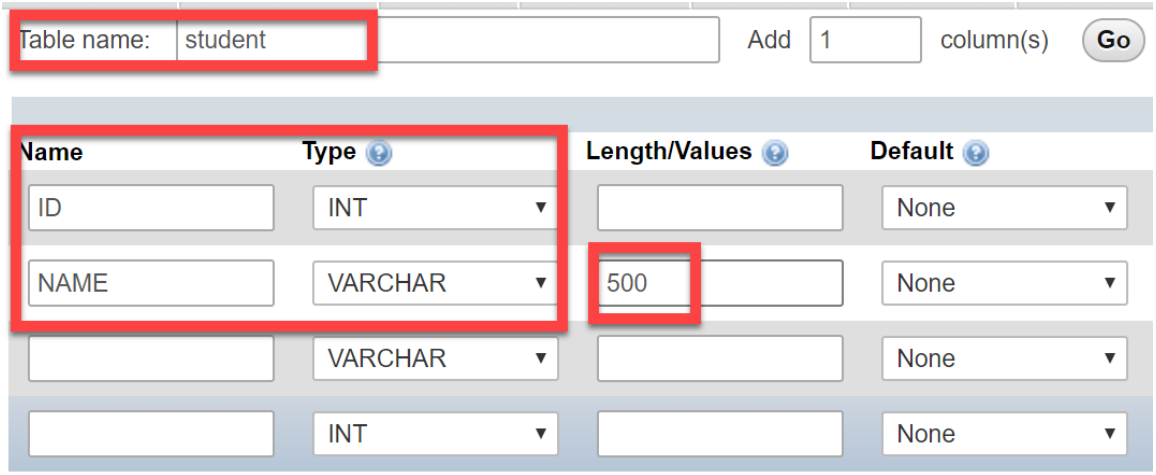
Step 4: Check the Database



Step 5: Create Two tables – student and marks

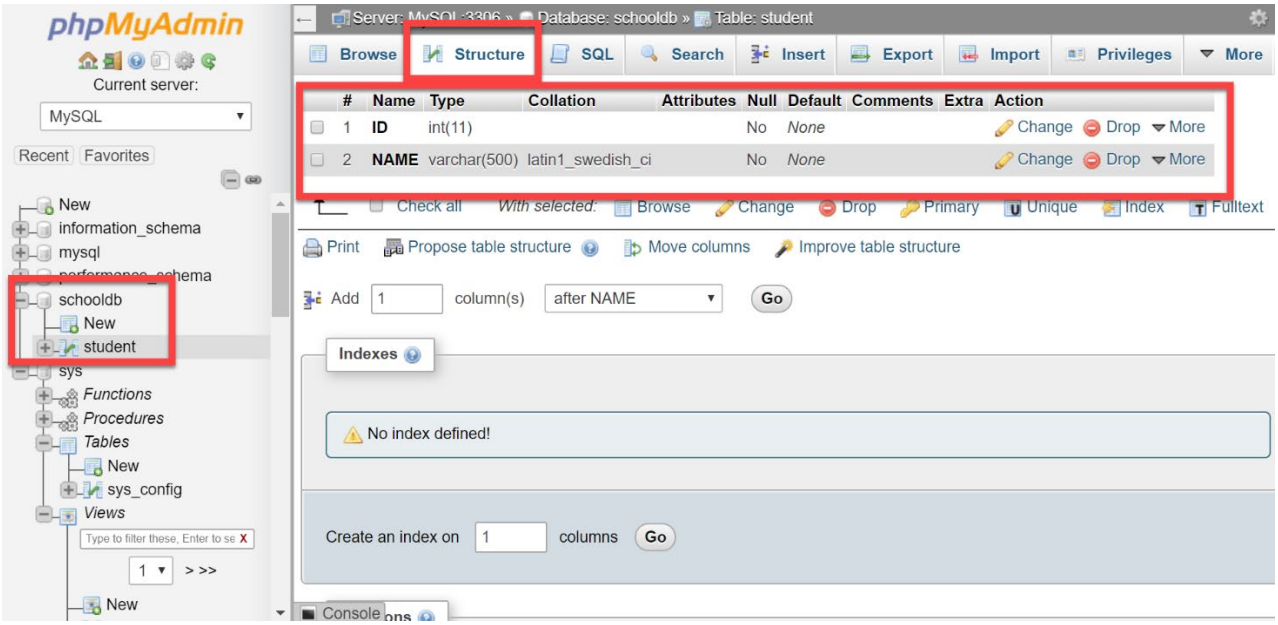


Step 6: Create Two tables – student

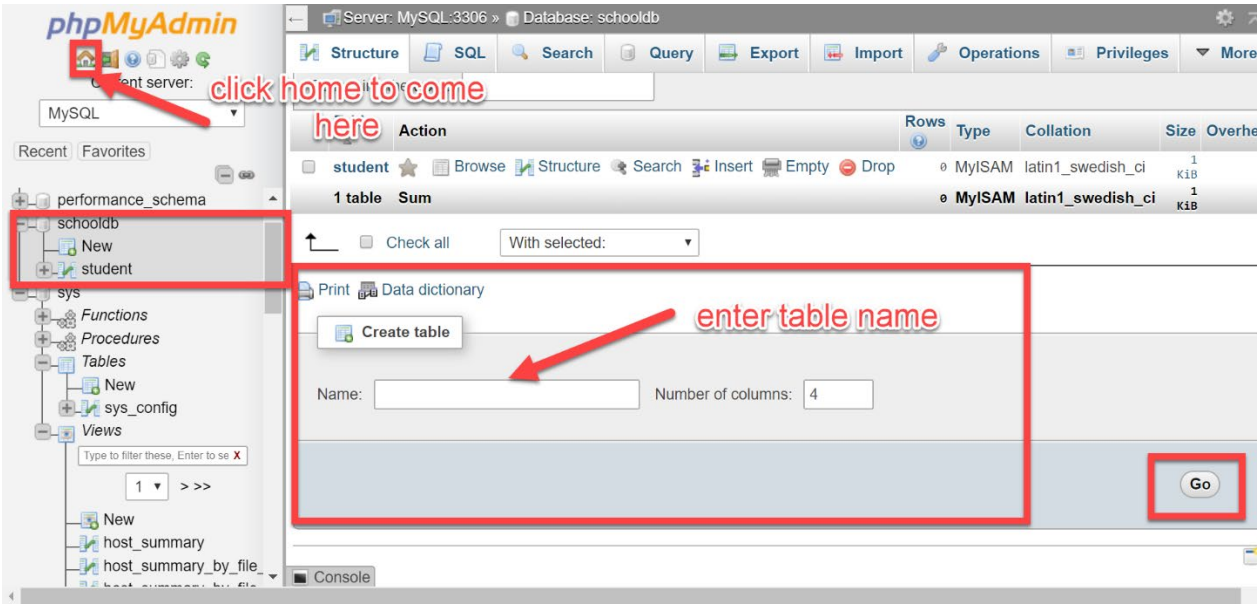


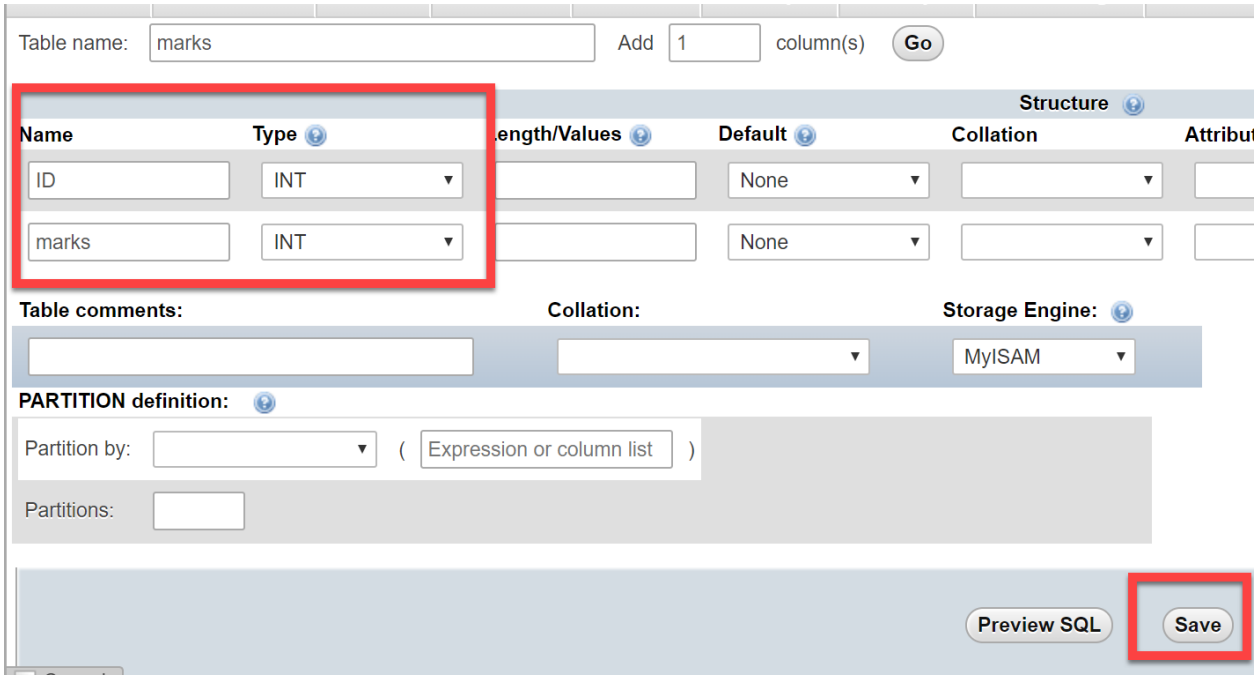
Save Button is bottom right

Step 7: Verify the table

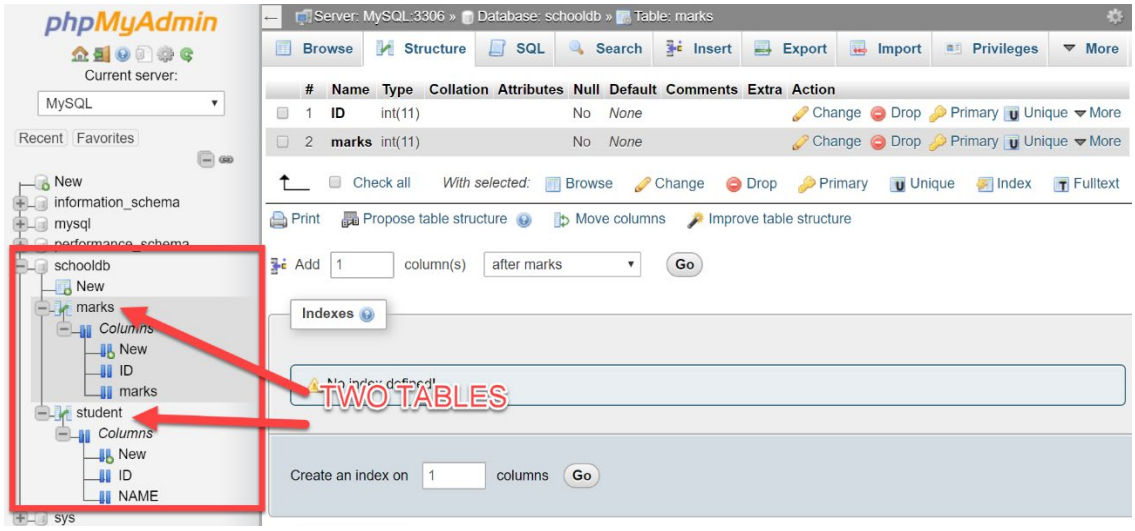


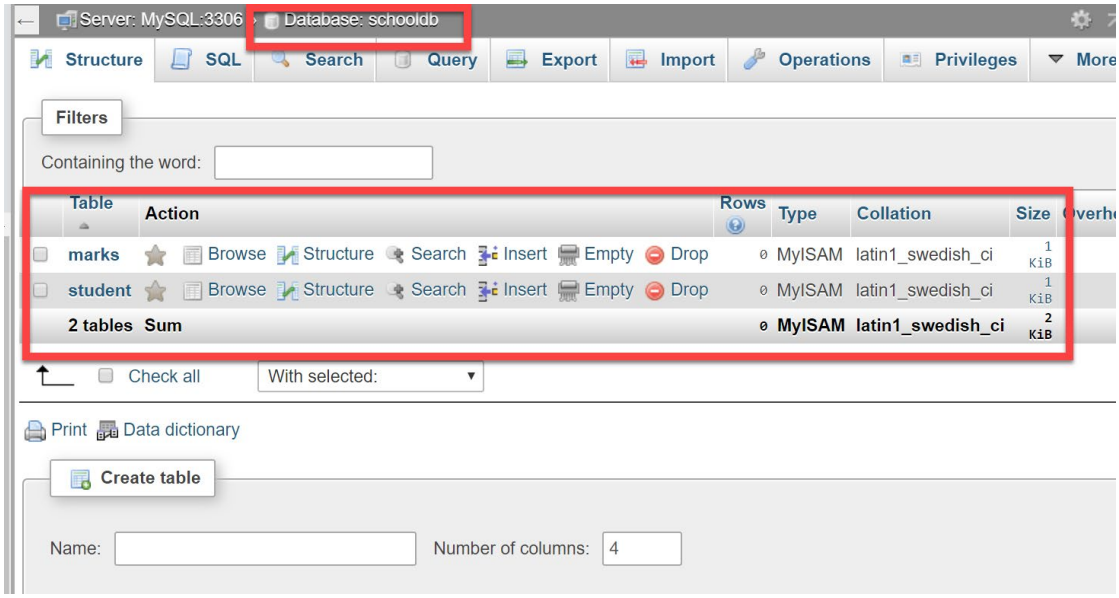
Step 8: Create the marks table





Step 9: Verify the Table





2.4 Run Simple SQL Statements

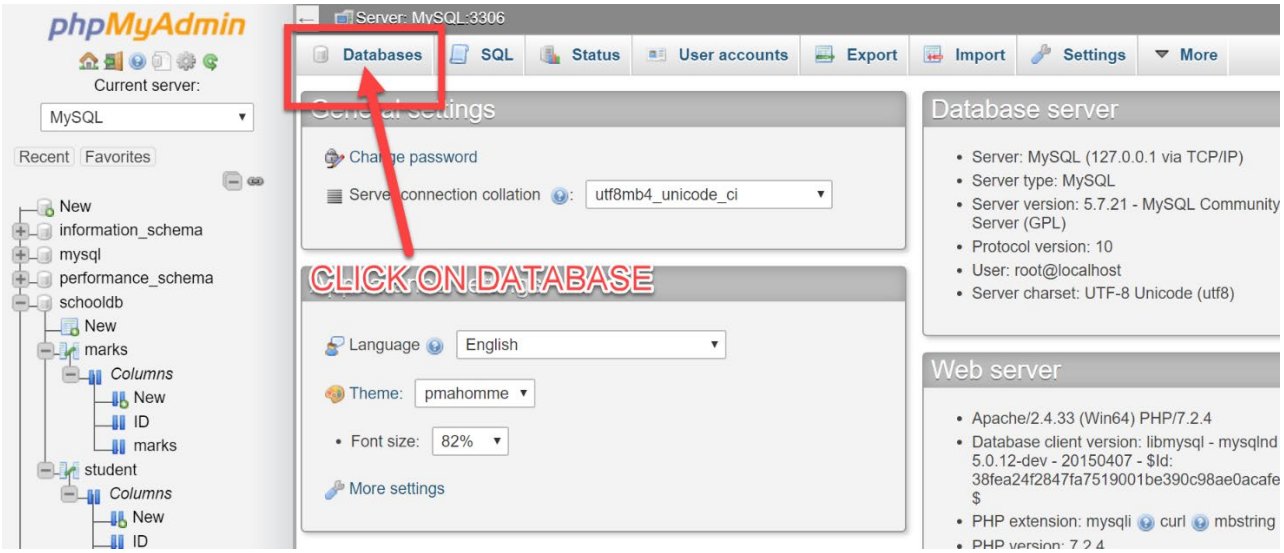
In this exercise, you will

- Create Table
- Insert Data in Table
- View the Table Data

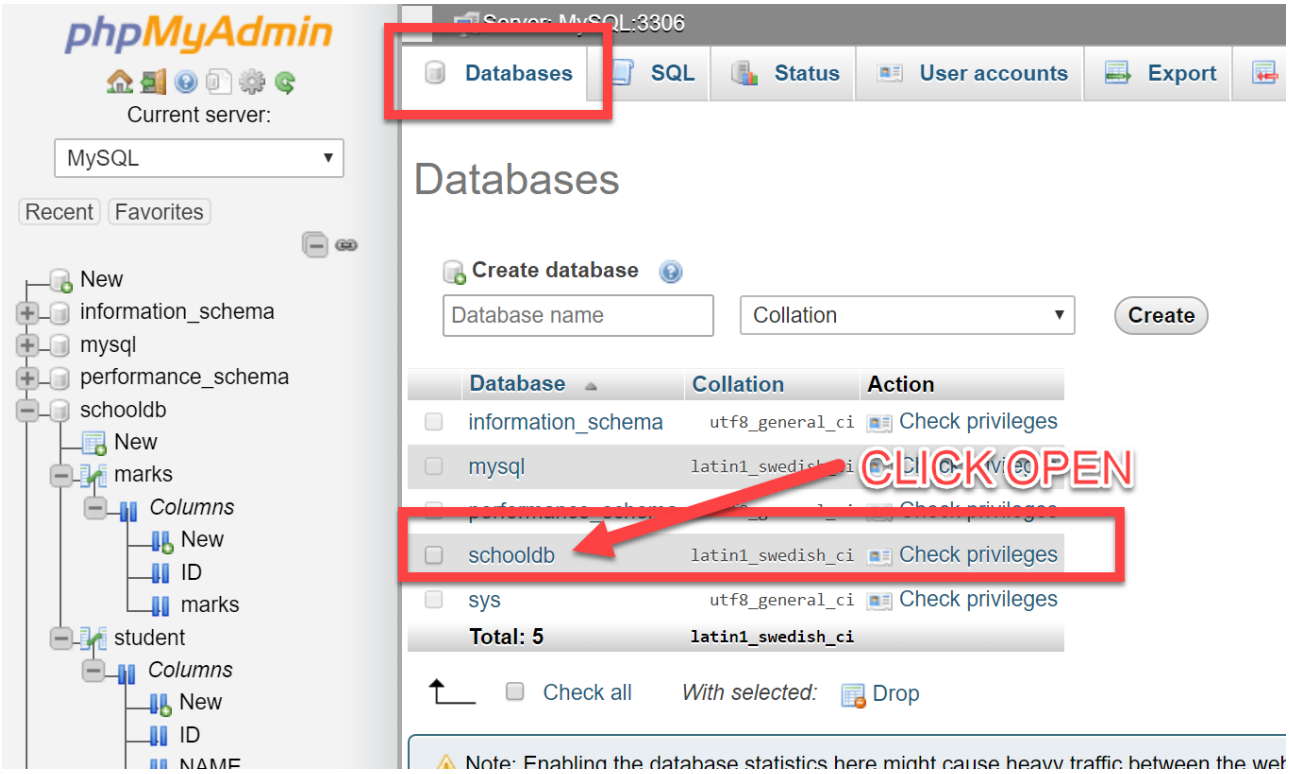
Step 1: Login into phpMyAdmin

Type the url: http://localhost/phpmyadmin in the browser.

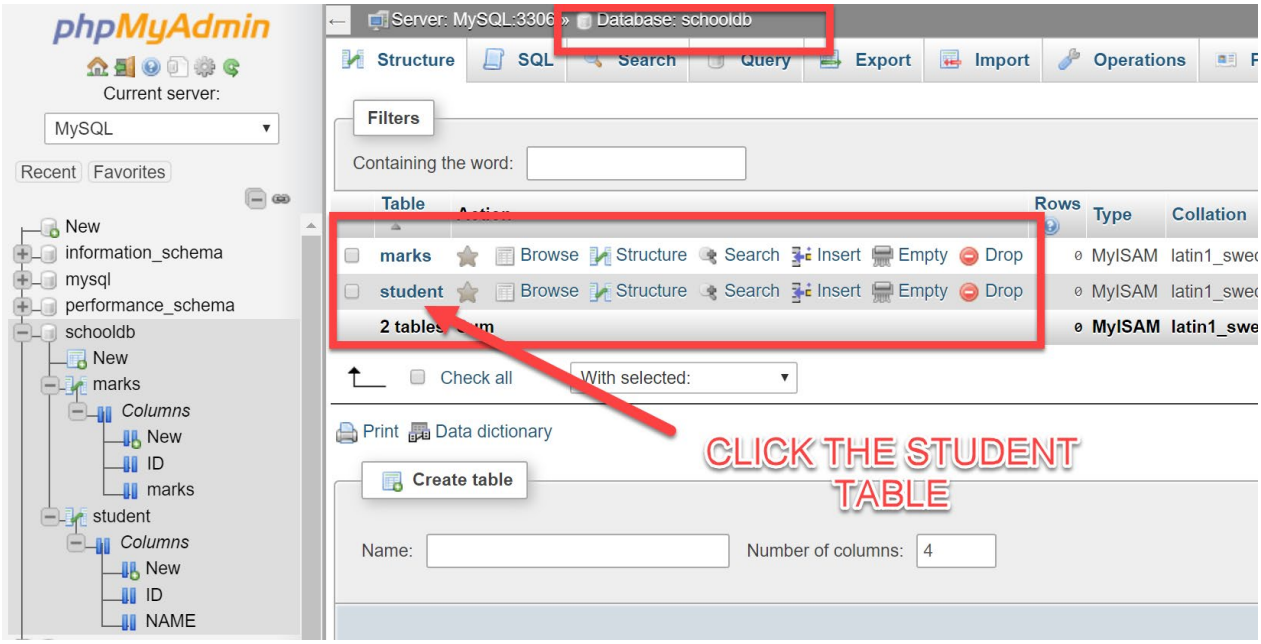
Step 2: Click on Database



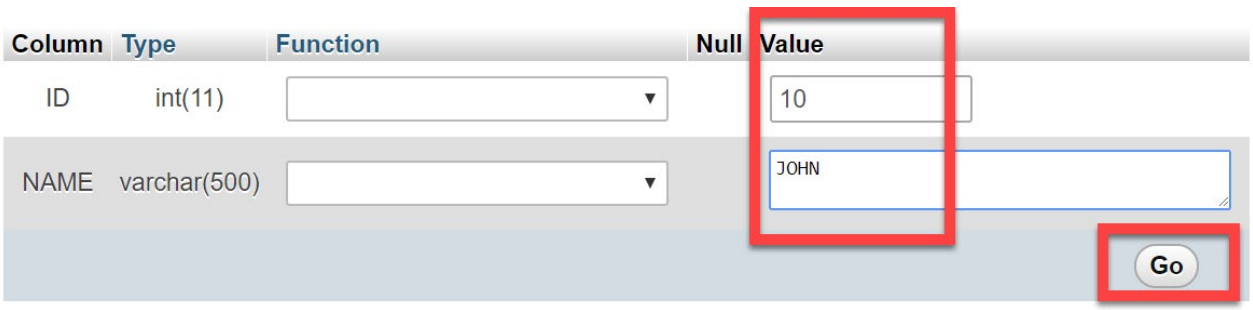
Step 3: Open the Database



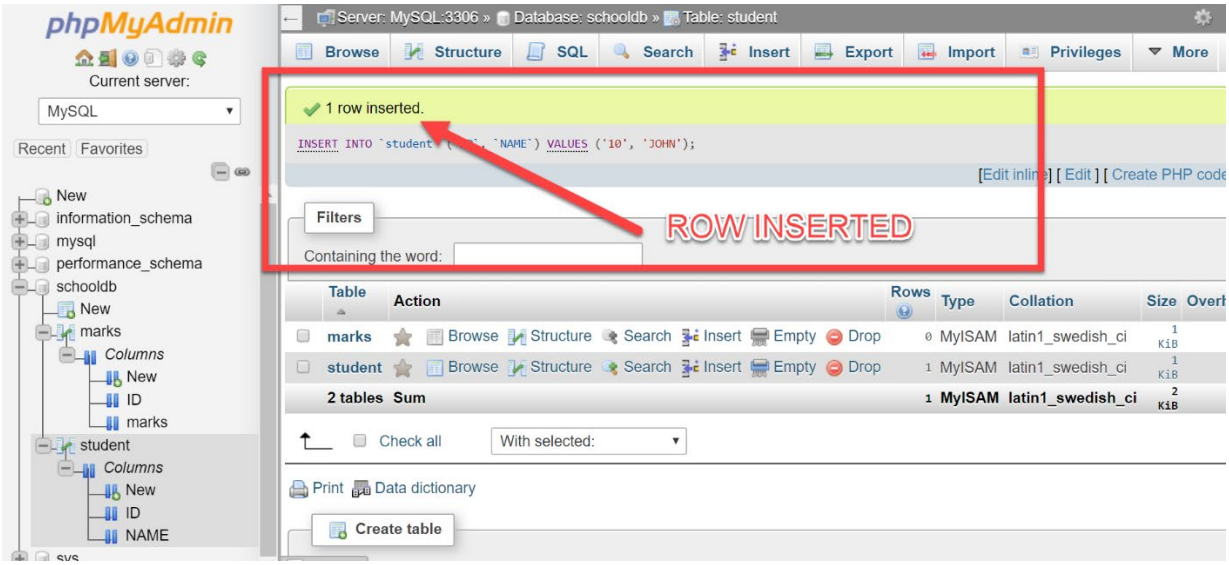
Step 4: Click the insert link



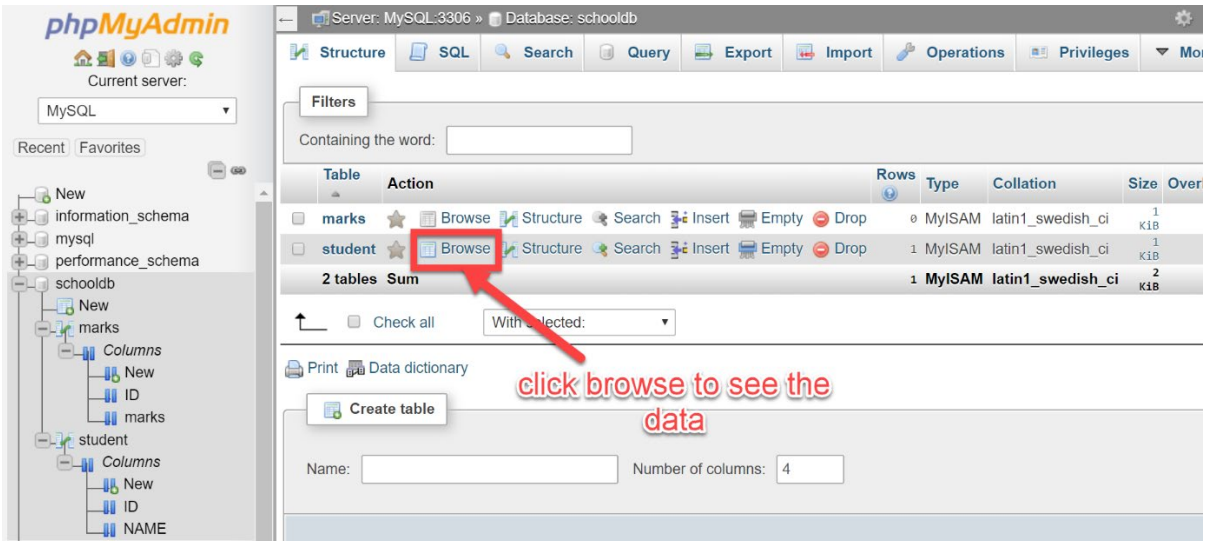
Step 5: Insert the data

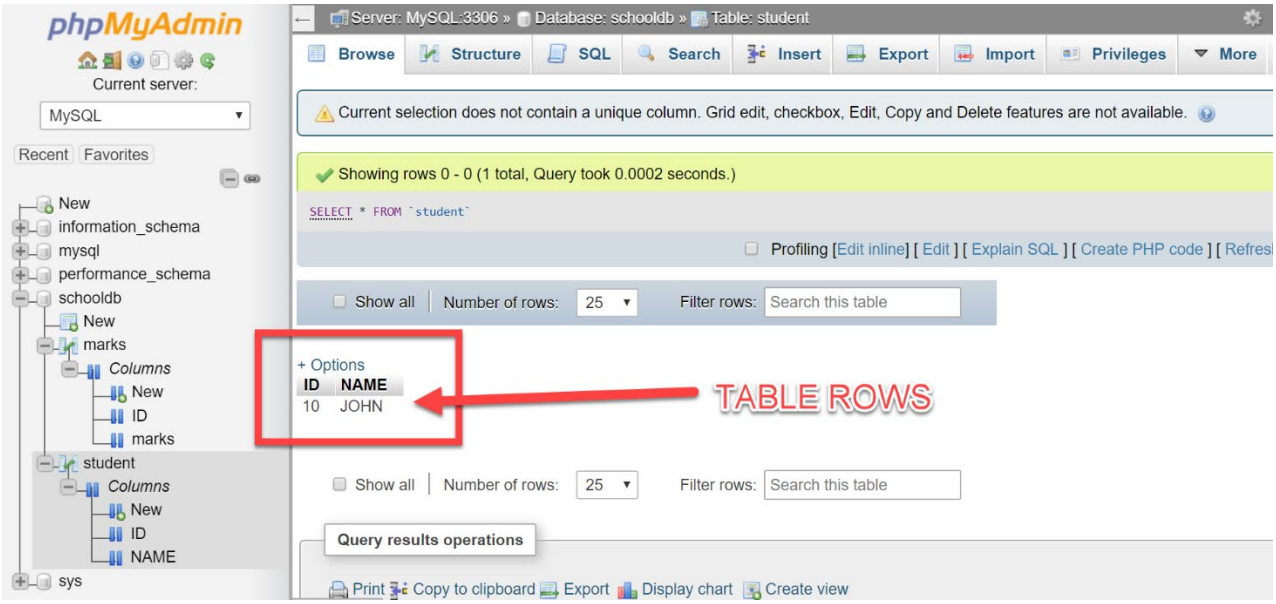


Step 6: Verify the Rows in the Table

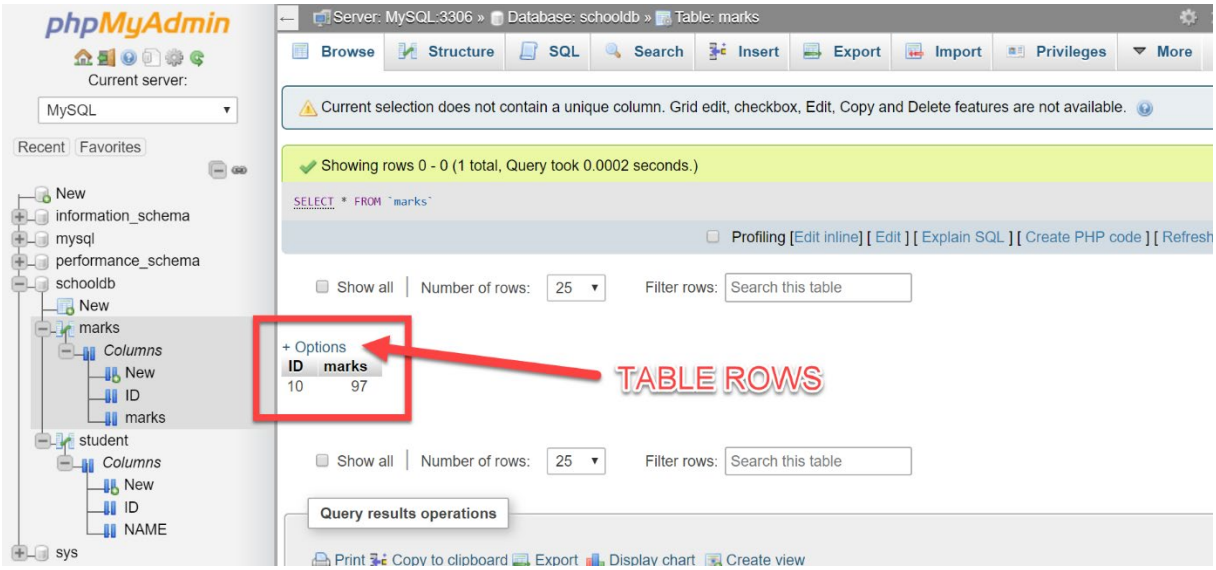


Click on the "**Browse**" link beside the table.





Step 7: Add the data for ‘marks’ table and browse it.



3. MySQL STATEMENTS

3 MySQL Statements

3.1 Create a Table

Follow this two Guide to create the table:

- 2.3 – Create Database and Table
- 2.4 – Run Simple SQL Statements

Exercise:

- Create a table name ‘fees’ with two fields
  - ID – INT
  - MARKS – INT
- Add some data to the fees table.

3.2 Drop a Table

Dropping a table means deleting a table.

DROP is a keyword to delete the table.

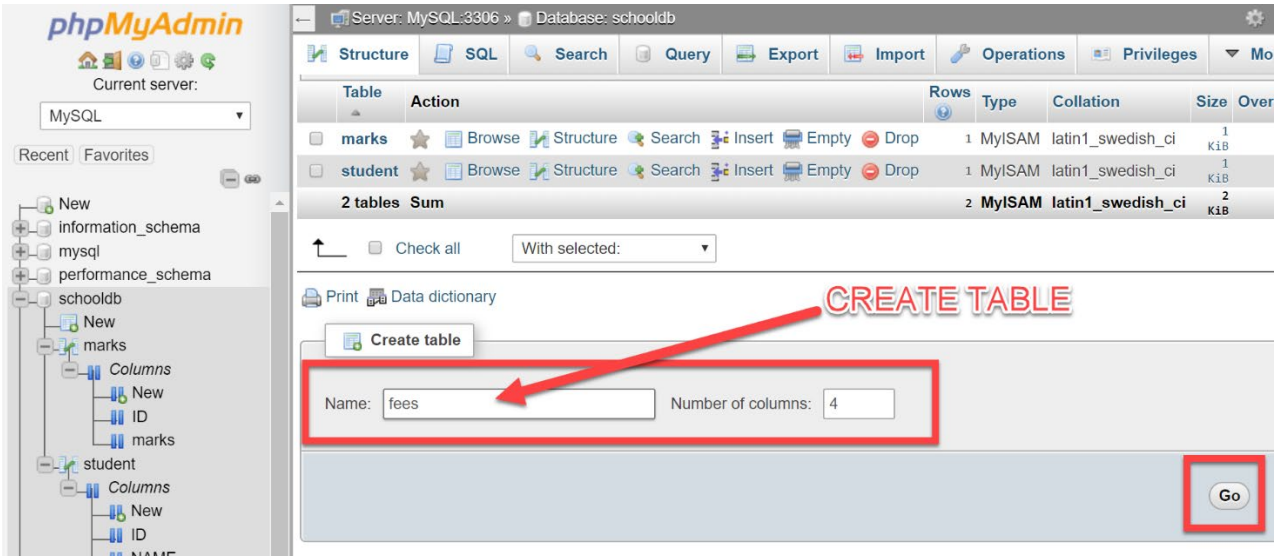
SQL SYNTAX:

DROP TABLE <TABLENAME>

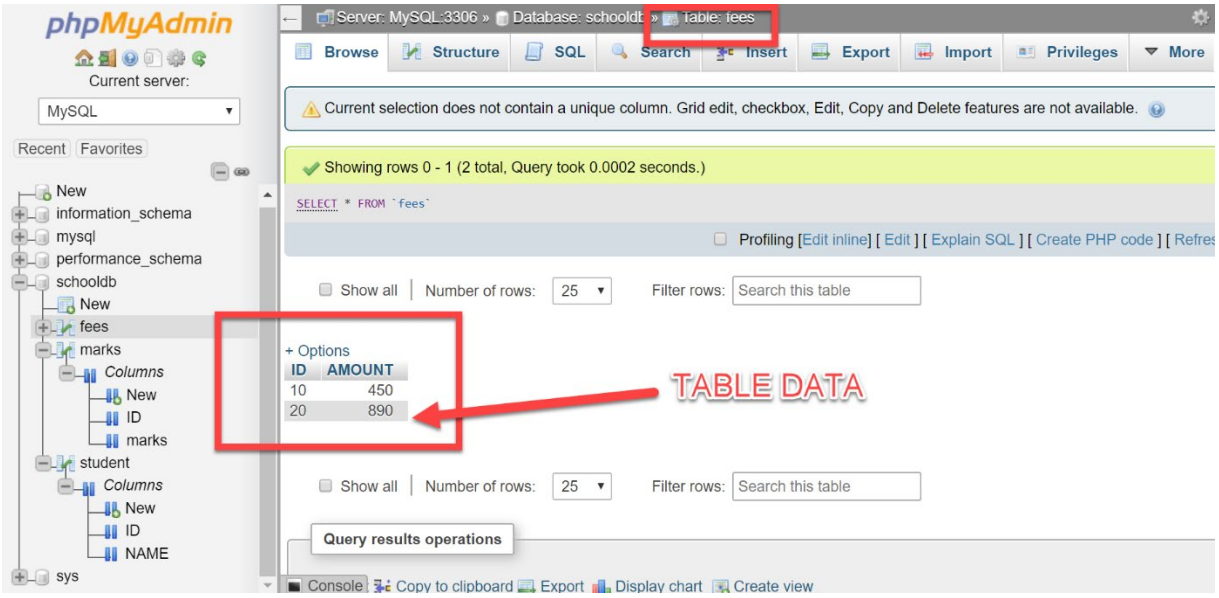
SQL QUERY:

DROP TABLE ‘fees’;

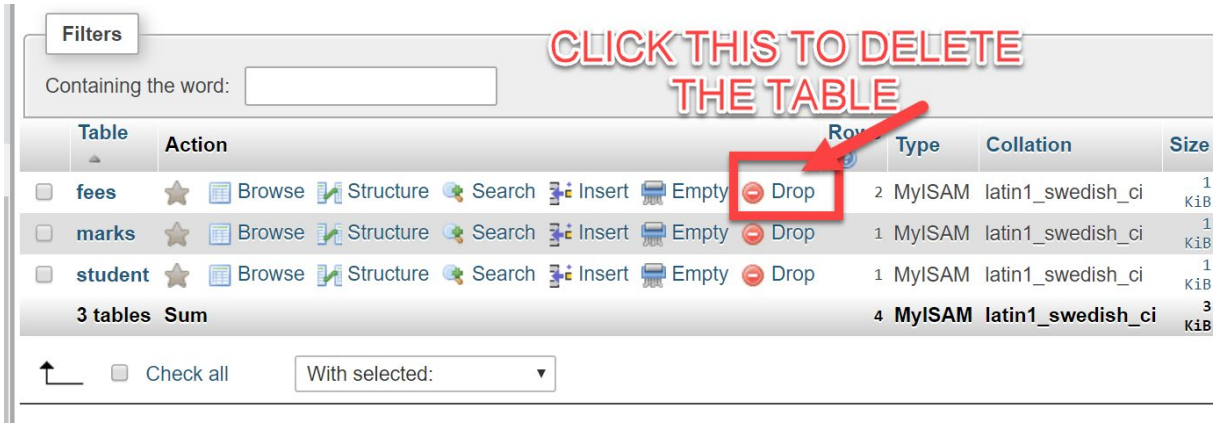
Step 1: Create a new Table ‘fees’ with ID and Amount Fields

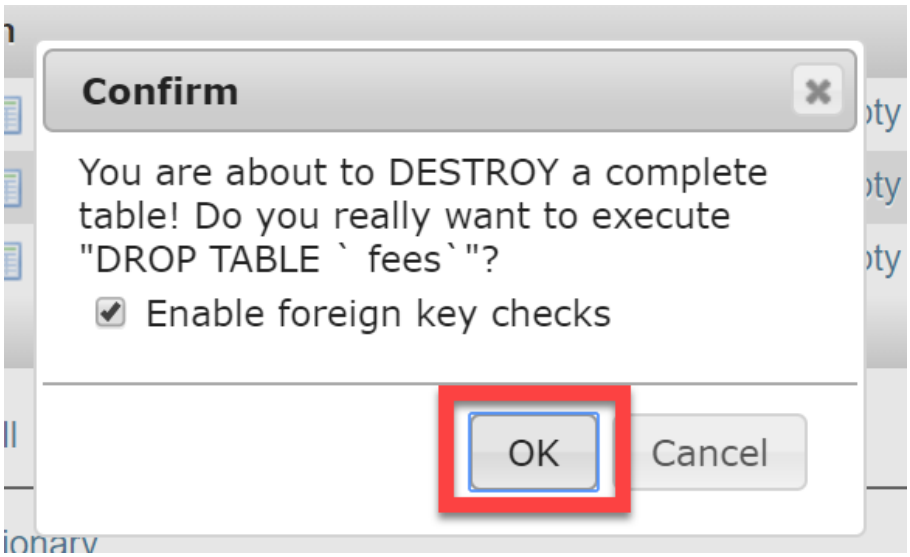


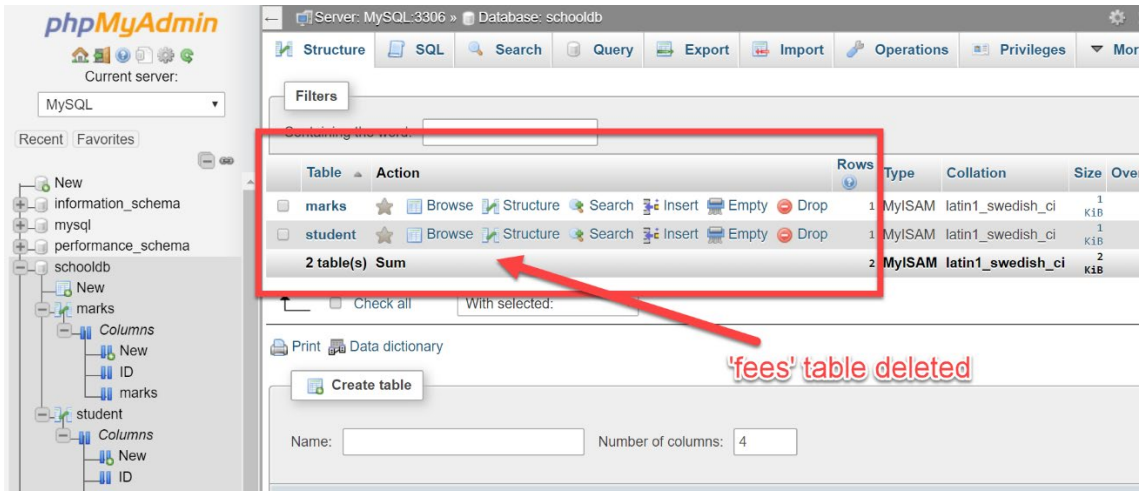
Step 2: Add some Data to the ‘fees’ Table



Step 3: Delete the ‘fees’ table


Filters
Containing the word:
CLICK THIS TO DELETE THE TABLE
Table
Action
Rows
Type
Collation
Size
fees Browse Structure Search Insert Empty Drop 2 MyISAM latin1_swedish_ci 1 KiB
marks Browse Structure Search Insert Empty Drop 1 MyISAM latin1_swedish_ci 1 KiB
student Browse Structure Search Insert Empty Drop 1 MyISAM latin1_swedish_ci 1 KiB
3 tables Sum 4 MyISAM latin1_swedish_ci 3 KiB
Check all
With selected:


Confirm
You are about to DESTROY a complete table! Do you really want to execute "DROP TABLE ` fees`"?
Enable foreign key checks
OK
Cancel


phpMyAdmin
Current server:
MySQL
Recent Favorites
New
information_schema
mysql
performance_schema
schooldb
New
marks
Columns
New
ID
marks
student
Columns
New
ID
Server: MySQL:3306 » Database: schooldb
Structure SQL Search Query Export Import Operations Privileges
Filters
Table Action Rows Type Collation Size
marks Browse Structure Search Insert Empty Drop 1 MyISAM latin1_swedish_ci 1 KiB
student Browse Structure Search Insert Empty Drop 1 MyISAM latin1_swedish_ci 1 KiB
2 table(s) Sum 2 MyISAM latin1_swedish_ci 2 KiB
Check all
With selected:
Print Data dictionary
'fees' table deleted
Create table
Name:
Number of columns: 4

3.3 INSERT Statements

INSERT is a keyword to INSERT the data in the table.

SQL SYNTAX:

INSERT INTO *table_name* VALUES (*value1*, *value2*, *value3)*;

SQL QUERY:

INSERT INTO fees VALUES(10, 86);

Exercise:

Add some data to the fees table.

3.4 SELECT Statements

SELECT is a keyword to select the data from the tables.

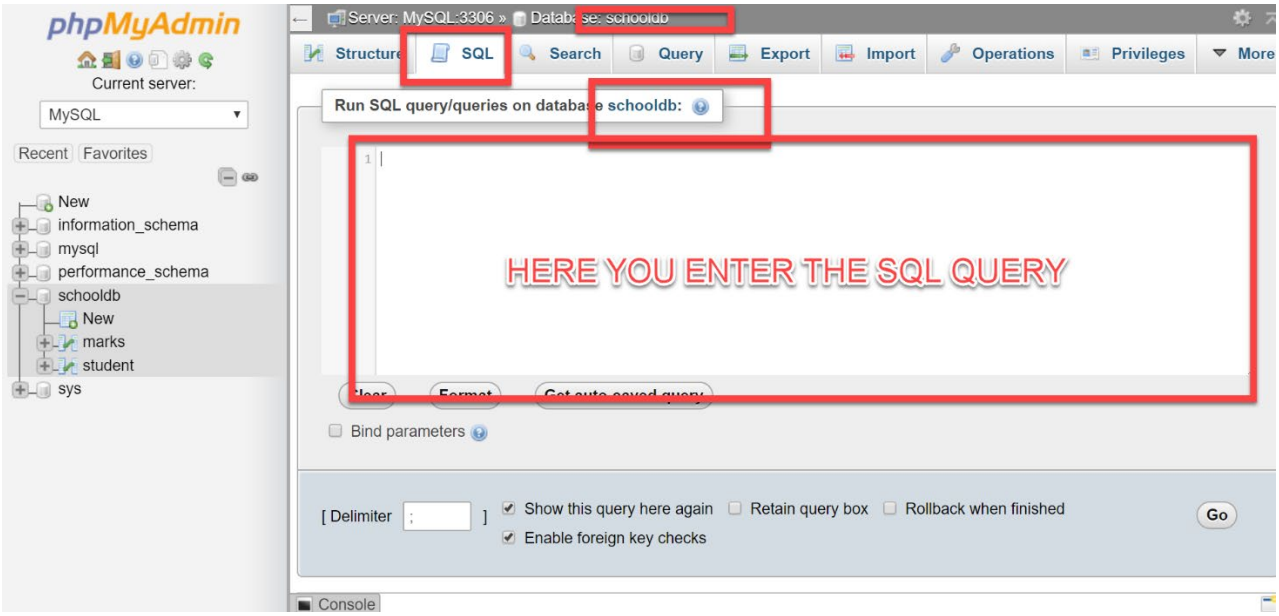
SQL SYNTAX:

SELECT * FROM *table_name*;

SQL QUERY:

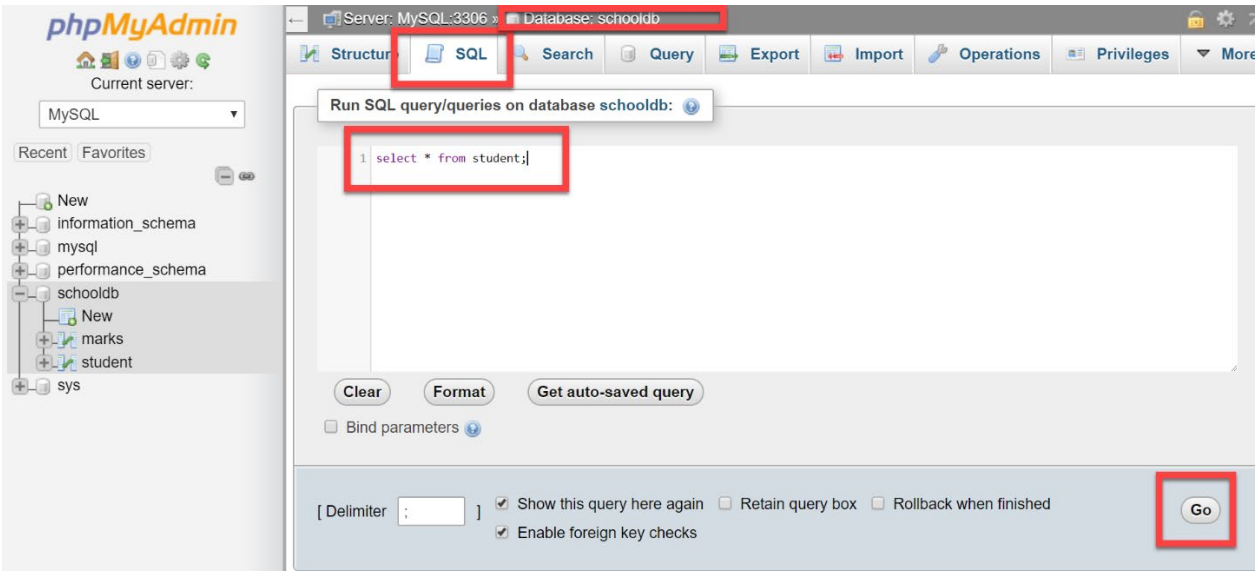
SELECT * FROM student;

Step 1: Login into phpMyAdmin and open the 'studentdb'

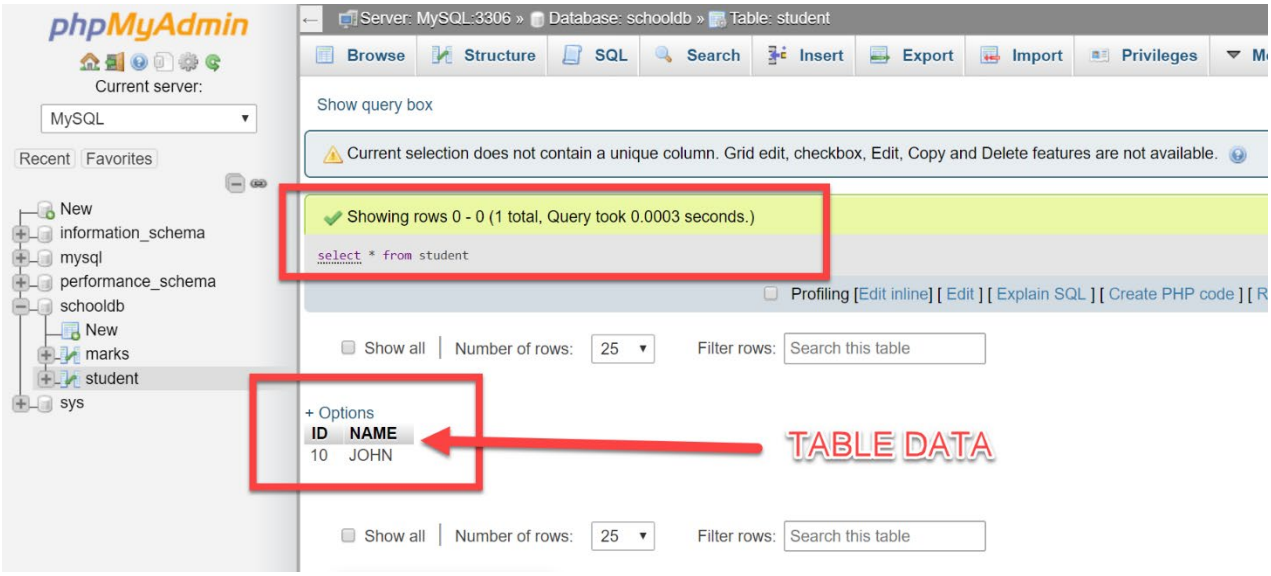


Step 2: Enter the SELECT SQL Query

SELECT * FROM student;



Step 3: Verify the Data



3.5 Clause WHERE, LIMIT

WHERE and LIMIT are called as Clause which are used along with SQL statement to apply the condition.

SQL SYNTAX:

SELECT * FROM *table_name WHERE ID <= 100*;

SQL QUERY:

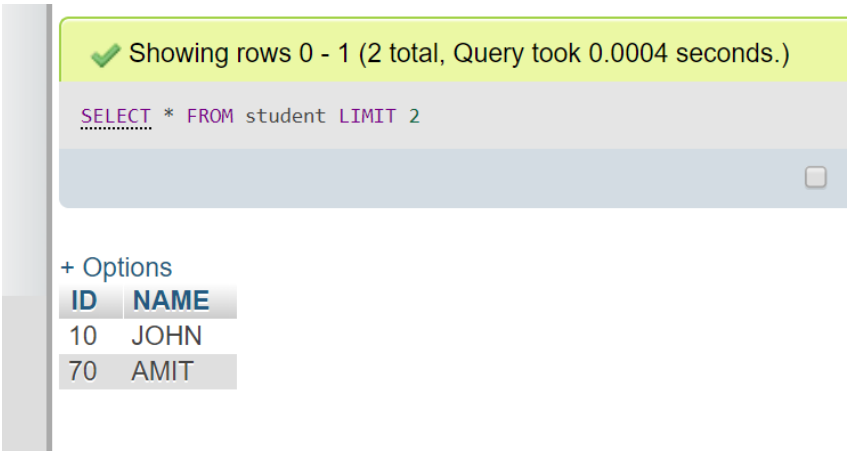
SELECT * FROM student *WHERE ID <= 100 LIMIT 2;*

This query tell the to MySQL to fetch student record where ID field value is less than 100 and fetch only two rows.

EXERCISE 1:

Fetch only 2 records from student table.

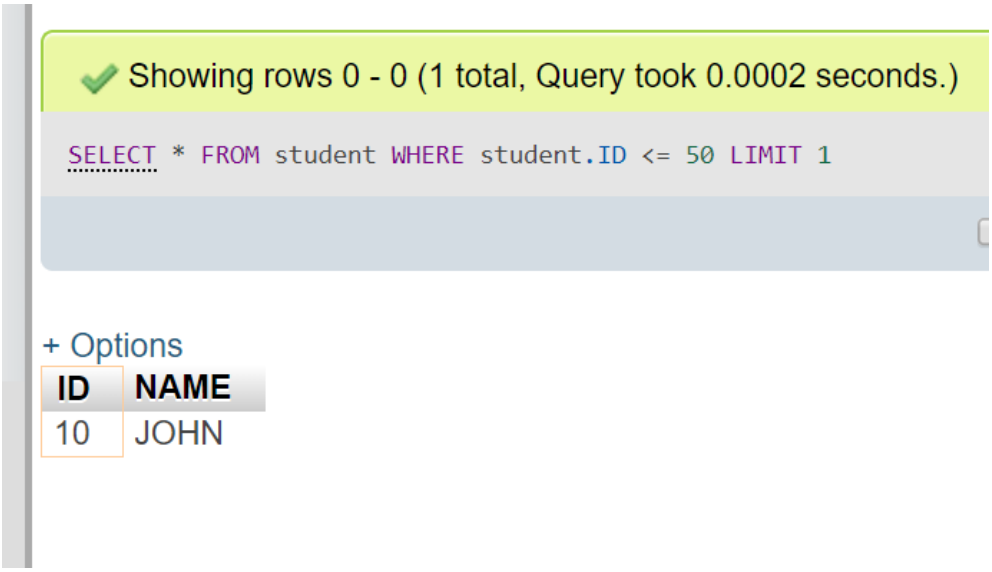
SELECT * FROM student LIMIT 2;



EXERCISE 2:

Fetch records where ID > 50 and LIMIT to 1 record.

SELECT * FROM student WHERE student.ID <= 50 LIMIT 1;



3.6 Operators IS NULL, LIKE, ORDER BY

IS NULL, LIKE and ORDER BY are called as operators that you can apply on the condition to check and sort the records.

IS NULL will check if the field is NULL or NOT.

ORDER BY will order / sort the records based on the field.

LIKE has two wild characters:

- % – The percent sign represents zero, one, or multiple characters
- _ – The underscore represents a single character

SQL SYNTAX:

SELECT * FROM *table_name WHERE columnN IS NOT NULL*

SELECT * FROM *table_name WHERE columnN LIKE pattern;*

SELECT * FROM *table_name WHERE columnN LIKE pattern ORDER BY columnN;*

SQL QUERY:

SELECT * FROM student *WHERE student.NAME IS NOT NULL;*

This query tell the to MySQL to fetch student record where NAME is not null.

SELECT * FROM student *WHERE student.NAME LIKE 'J%';*

This query tell the to MySQL to fetch student record where NAME matches with J.

SELECT * FROM student *WHERE student.NAME LIKE 'J%' ORDER BY student.NAME;*

This query tell the to MySQL to fetch student record where NAME matches with J and sort the records by NAME.

EXERCISE 1:

Execute the above 3 Queries.

3.7 UPDATE Statements

UPDATE statement is used to update an existing row in the table based on a condition specified with WHERE clause.

SQL SYNTAX:

UPDATE *table_name* SET *column1* = *value1*, *column2* = *value2*
WHERE *condition*;

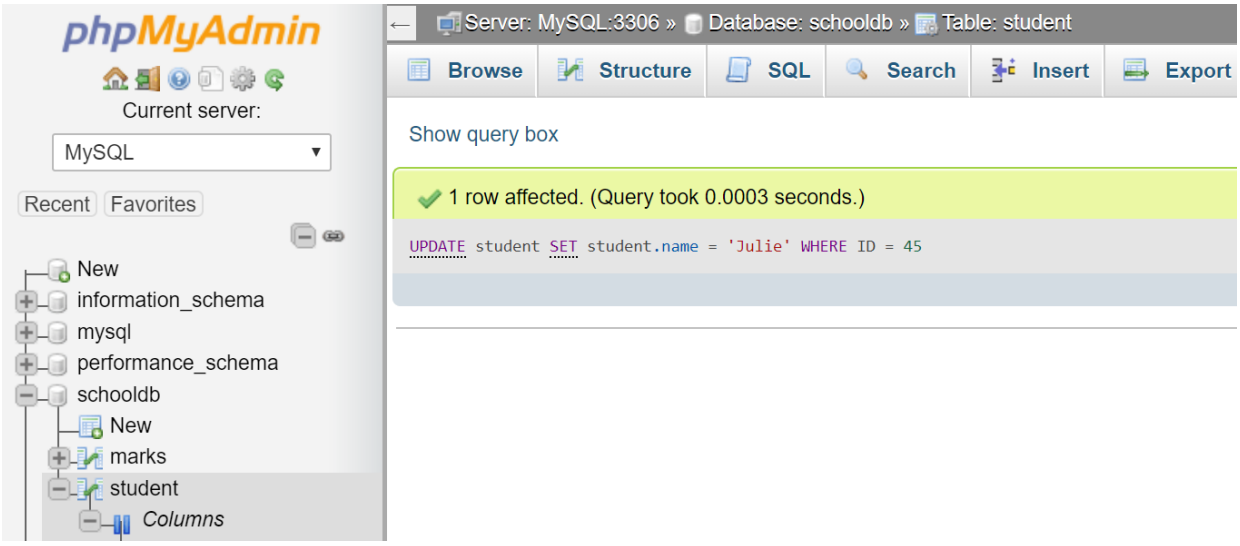
SQL QUERY:

UPDATE student
SET student.name = 'Julie' WHERE ID = 100;

EXERCISE 1:

Update the record name when ID = 45

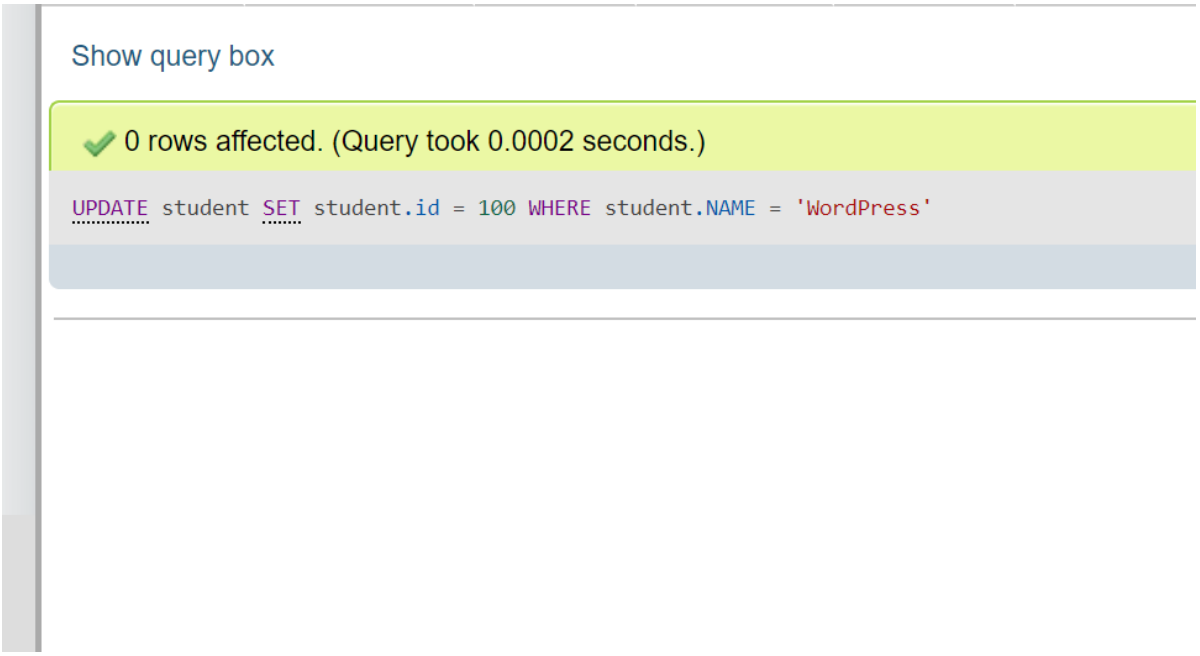
UPDATE student
SET student.name = 'Julie' WHERE ID = 45;



EXERCISE 2:

Update the record ID = 100 where NAME = 'WordPress'

UPDATE student SET student.id = 100 WHERE student.NAME = ‘WordPress’



3.8 DELETE Statements

DELETE statement is used to delete an existing row in the table based on a condition specified with WHERE clause.

SQL SYNTAX:

DELETE from table_name WHERE *condition*;

SQL QUERY:

DELETE FROM student WHERE student.name=’John’;

EXERCISE 1:

Delete a row where ID = 100 from student table.

```
DELETE FROM student WHERE student.ID = 100;
```

EXERCISE 2:

Delete a row where name is NULL

```
DELETE FROM student WHERE student.NAME IS NULL;
```

4. MySQL with PDO

4 mySQL & PHP with PDO

4.1 Database Connectivity

What is PDO?

PDO stands for PHP Data Objects it is a library that can be used to connect to MySQL from PHP code.

PDO gives a object oriented database functions to perform the database operations on MySQL.

The biggest advantage of using PDO is that you can change database any time from MySQL to Oracle or Microsoft SQL and the underlying PDO code will not change.

How to Connect to MySQL DB with PDO?

To connect MySQL DB we need following things:

- Hostname / IP of the server on which MySQL is running.
- Database Name
- Userid
- Password

We have seen how to work with MySQL with phpMyAdmin.

Define the parameters:

$dns = 'mysql:host=localhost;dbname=studentdb';

$username = 'root';

$password = 'root';

$db = new PDO($dns, $username, $password);

$dns will hold the parameters separated by semicolon (;).

mysql is the name of the database

localhost means mysql server is running on local machine.

dbname is the database name that we created here.

$username and $password are the user credentials to login into the MySQL.

$db will hold the connection to the MySQL and then we can execute the SQL query to work on the database tables.

Here are the high level steps to connect to DB:

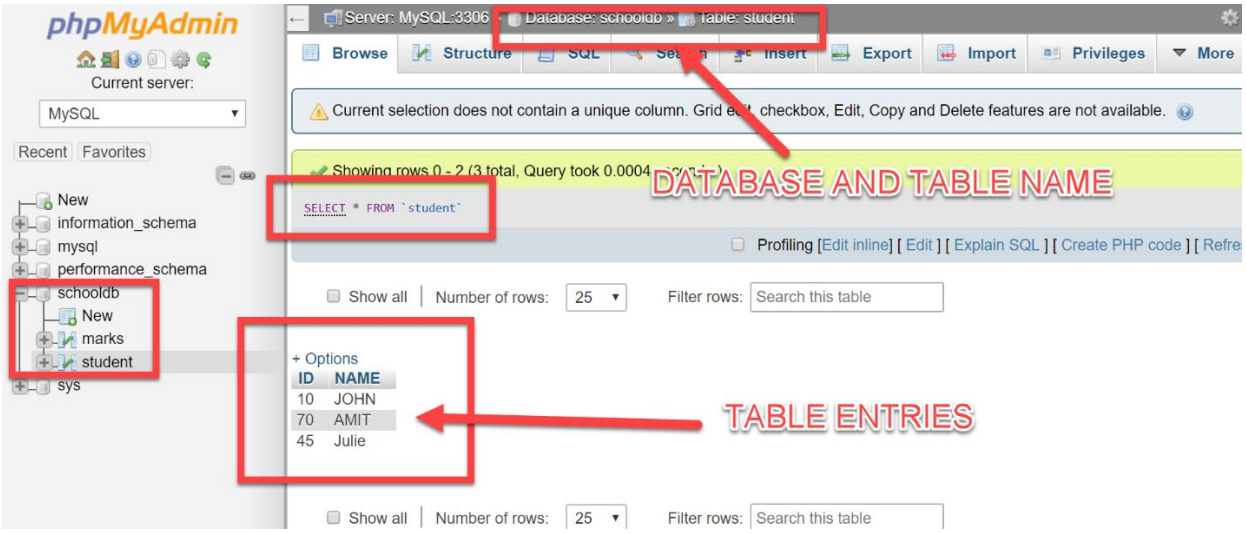
- Define the DNS variable with hostname and database name
- Create a PDO class with $dns, user name and password.
- This will create an instance using which we can access the database.

4.2 Simple Query from PHP to mySQL

Write a Simple SELECT query using PDO

Credentials:

Database Name: studentdb
Table Name: student
Username: root
password: root



Sample Example

[Download the Example]

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta name="description" content="Page Description">
    <title>PDO - SELECT Query</title>
</head>

<body>
<h1>PDO - SELECT Query</h1>
<?php

    $query = "SELECT * FROM student;";
    $dns = 'mysql:host=localhost;dbname=schooldb';
    $username = 'root';
    $password = 'root';
    try{

        $db = new PDO($dns, $username, $password);

        //Prepared Statement
        $statement = $db->prepare($query);

        //Execute the Query
        $statement->execute();

        //Loop all the records using fetch records
        while ($student = $statement->fetch()) {
            echo "ID: " . $student['ID']."<br />\n";
            echo "NAME: " . $student['NAME']."<br />\n";
        }
```

```
        //close the connection to DB
        $statement->closeCursor();

    }catch(Exception $e)
    {
        $error_message = $e->getMessage();
        echo "<p>Error message: $error_message </p>";
    }

?>
</body>
</html>
```

PDO - SELECT Query

ID: 10
NAME: JOHN
ID: 70
NAME: AMIT
ID: 45
NAME: Julie

Live Preview

Exercise 1

Download the Exercise 1

Exercise 1: Write a Select query to fetch student where ID > 50.

SELECT * FROM student where ID > 50;

PDO - SELECT Query

ID: 70
NAME: AMIT

Live Preview

Exercise 2

Download the Exercise 2

Exercise 1: Write a Select query to fetch student and sort in ascending order by name field.

SELECT * FROM student order by name;

PDO - SELECT Query

ID: 70
NAME: AMIT
ID: 10
NAME: JOHN
ID: 45
NAME: Julie

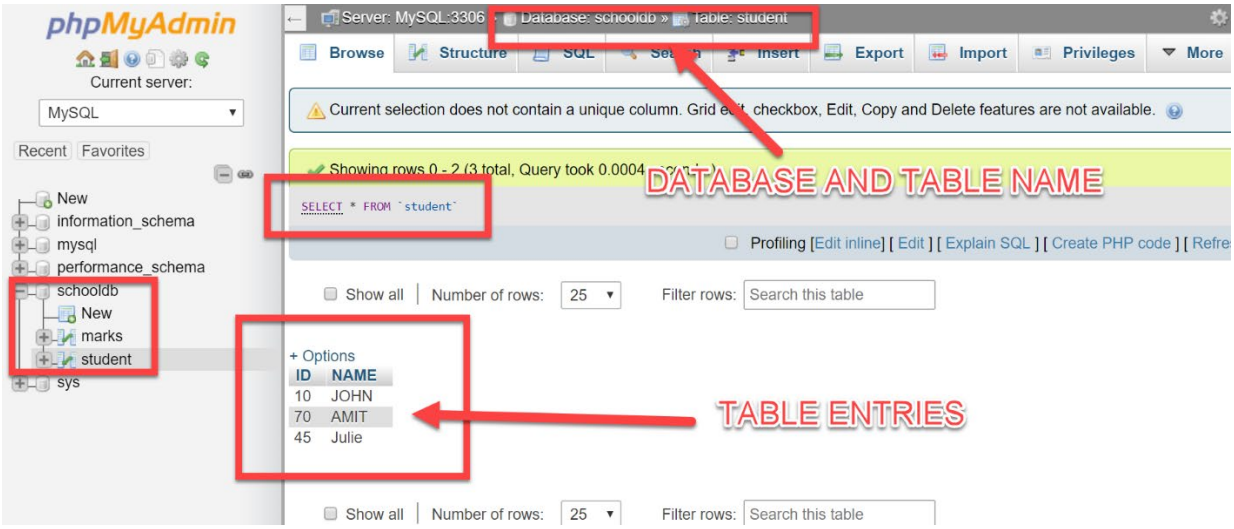
Live Preview

4.3 Form to Add, Edit, Update and Delete

Write a Student form to Add, Edit and Delete the Entries from MySQL DB.

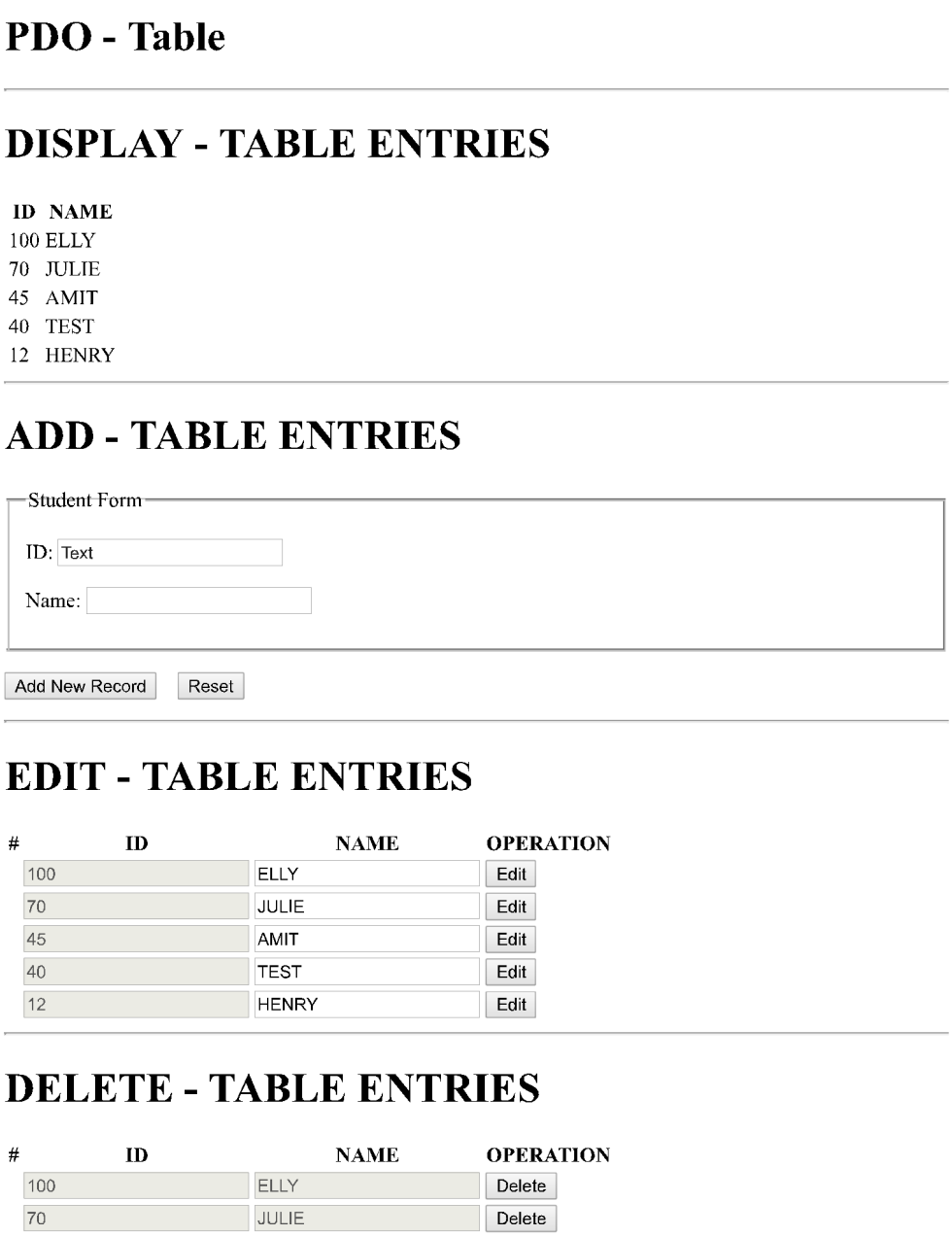
Credentials:

Database Name: studentdb
Table Name: student
Username: root
password: root



Sample Example

Download the Example



[Live Preview]

Exercise 1

Exercise 1: Create you own form and do the Add, Edit and Delete Operation.

5. MySQLi with PHP

5 mySQL & PHP with mysqli

5.1 Database Connectivity

What is mysqli?

mysqli is a library that can be used to connect to MySQL from PHP code.

mysqli is the just the extension of the mysql library (*i* stands for improved).

mysqli is has more features and function to work with mysql and it very specific to mysql.

The disadvantage of using mysqli is that you cannot change database once your code written with this library.

How to Connect to MySQL DB with mysqli?

To connect MySQL DB we need following things:

- Hostname / IP of the server on which MySQL is running.
- Database Name
- Userid
- Password

We have seen how to work with MySQL with phpMyAdmin.

Define the parameters:

$hostname = ‘localhost’;

$db_name = ‘schooldb’;

$username = ‘root’;

$password = ‘root’;

@ $db = mysqli_connect($hostname, $username, $password, $db_name);

@ is the error suppressor operator that is used to suppress any error throw by that statement.

localhost means mysql server is running on local machine.

$db_name is the database name that we created here.

$username and $password are the user credentials to login into the MySQL.

$db will hold the connection to the MySQL and then we can execute the SQL query to work on the database tables.

Here are the high level steps to connect to DB:

- Define the DNS variable with hostname and database name
- Create a mysqli class with host, database, user name and password.
- This will create an instance using which we can access the database.

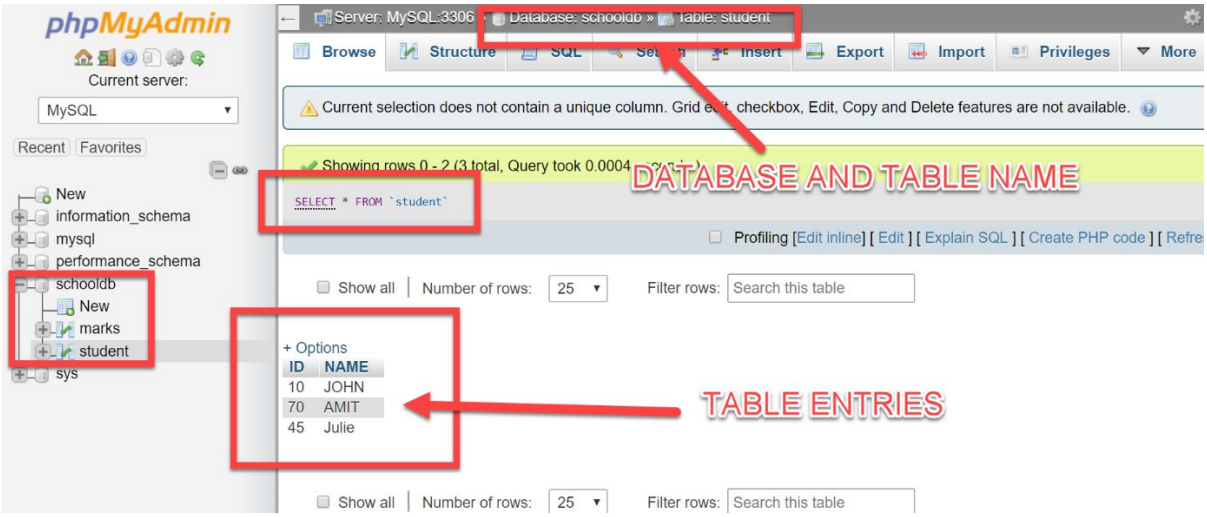
5.2 Simple Query from PHP to mySQL

Write a Simple SELECT query using PDO

Credentials:

Database Name: studentdb
Table Name: student

Username: root
password: root



Sample Example

Download the Example

```
<!DOCTYPE html>
<html>
<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width, initial-scale=1.0">
    <meta name="description" content="Page Description">
    <title>mysqli - SELECT Query</title>
</head>

<body>
<h1>mysqli - SELECT Query</h1>
<?php

    $query = "SELECT * FROM student";
    $hostname = 'localhost';
    $db_name = 'schooldb';
    $username = 'root';
    $password = 'root';



    try{

        $db = new mysqli($hostname, $username, $password, $db_name);

        // Check connection
        if ($db->connect_error) {
            die("Connection failed: " . $db->connect_error);
```

```
        }

        //Select Query
        $result = $db->query($query);


        //Loop all the records using fetch records
        while ($student = $result->fetch_assoc()) {
            echo "ID: " . $student['ID']."<br />\n";
            echo "NAME: " . $student['NAME']."<br />\n";
        }

        //close the connection to DB
        $db->close();

    }catch(Exception $e)
    {
        $error_message = $e->getMessage();
        echo "<p>Error message: $error_message </p>";
    }

?>
</body>
</html>
```

mysqli - SELECT Query

ID: 45
NAME: AMIT
ID: 100
NAME: ELLY
ID: 12
NAME: HENRY
ID: 70
NAME: JULIE
ID: 40
NAME: TEST

Live Preview

Exercise 1

Download the Exercise 1

Exercise 1: Write a Select query to fetch student where ID > 50.

SELECT * FROM student where ID > 50;

mysqli - SELECT Query

ID: 100
NAME: ELLY
ID: 70
NAME: JULIE

Live Preview

Exercise 2

Download the Exercise 2

Exercise 1: Write a Select query to fetch student and sort in ascending order by name field.

SELECT * FROM student order by name;

mysqli - SELECT Query

ID: 45
NAME: AMIT
ID: 100
NAME: ELLY
ID: 12
NAME: HENRY
ID: 70
NAME: JULIE
ID: 40
NAME: TEST

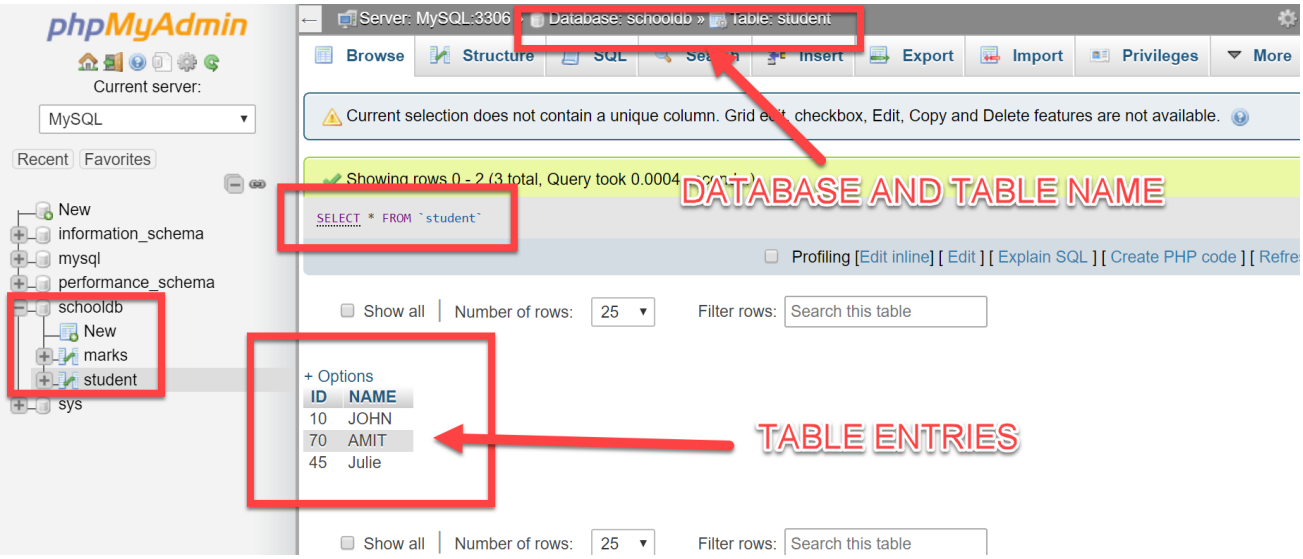
Live Preview

5.3 Form to Add, Edit, Update and Delete

Write a Student form to Add, Edit and Delete the Entries from MySQL DB.

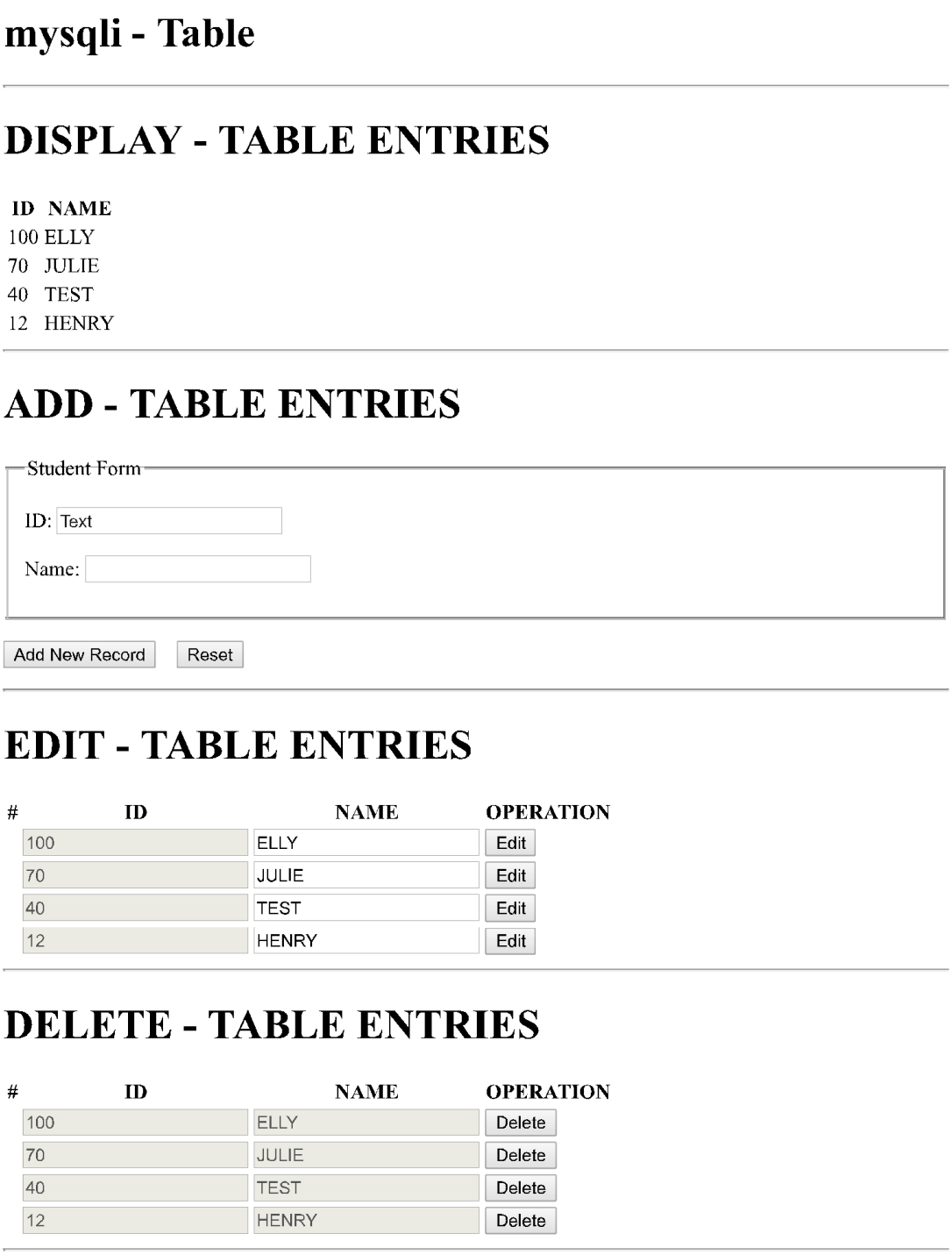
Credentials:

Database Name: studentdb
Table Name: student
Username: root
password: root



Sample Example

[Download the Example]



Live Preview

Exercise 1

Exercise 1: Create your own form and do the Add, Edit and Delete Operation.