
1. Introduction to SQL

SQL stands for Structural Query Language, and SQL is used for storing, manipulation, and retrieving data from the database.

History of SQL

The SQL(Structural Query language) was first created in the 1970s by IBM researchers Raymond Boyce and Donald Chamberlin. The Query language, known then as **SEQUEL**, was created following the publishing of Edgar Frank Todd's paper, In 1970, A Relational Model of Data for Large Shared Data Banks.

In his paper, Todd proposed that all the data in a database be represented in the form of relations. It was based on this theory that Chamberlin and Boyce came up with SQL. The original SQL version was designed to retrieve and manipulate data stored in IBM's original RDBMS known as "**System R**." It wasn't until several years later, however, that the Structural Query language was made available publicly. In 1979, a company named as Relational Software, which later became Oracle, commercially released its version of the SQL language called Oracle V2.

Since that time, the American National Standards Institute (ANSI) and the International Standards Organization have deemed the SQL language as the standard language in relational database communication. While major SQL vendors do modify the language to their desires, most base their SQL programs off of the ANSI approved version.

What is Database?

A database is a well-ordered collection of data. A database is an electronic system that permits data to be easily manipulated, accessed, and updated, or an organization uses a database as a method of managing, storing, and retrieving information. Modern databases are handled using a database management system (DBMS).

Relational Database

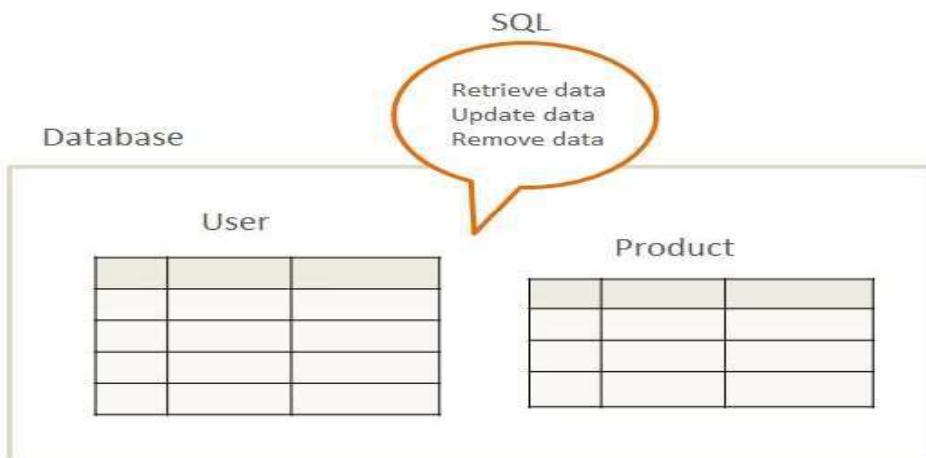
Relational Databases are used to store data in tables (rows and columns). Some common relational **database** management systems that use **SQL** are **Oracle**, **Sybase**, **Microsoft SQL Server**, **Access**, **Ingres**, etc.

Table

Id	Firstname	Lastname
1	Arun	mishra
2	Pranjal	pandey
3	Sunny	singh
4	David	pal
5	Michel	michel

SQL and Relational Databases

A Relational Database contains tables that store the data that is related in some way. SQL is the query language that allows **retrieval and manipulation** of table data in the relational database. The database below has two tables: one with data on **Users** and another with data on **Products**.



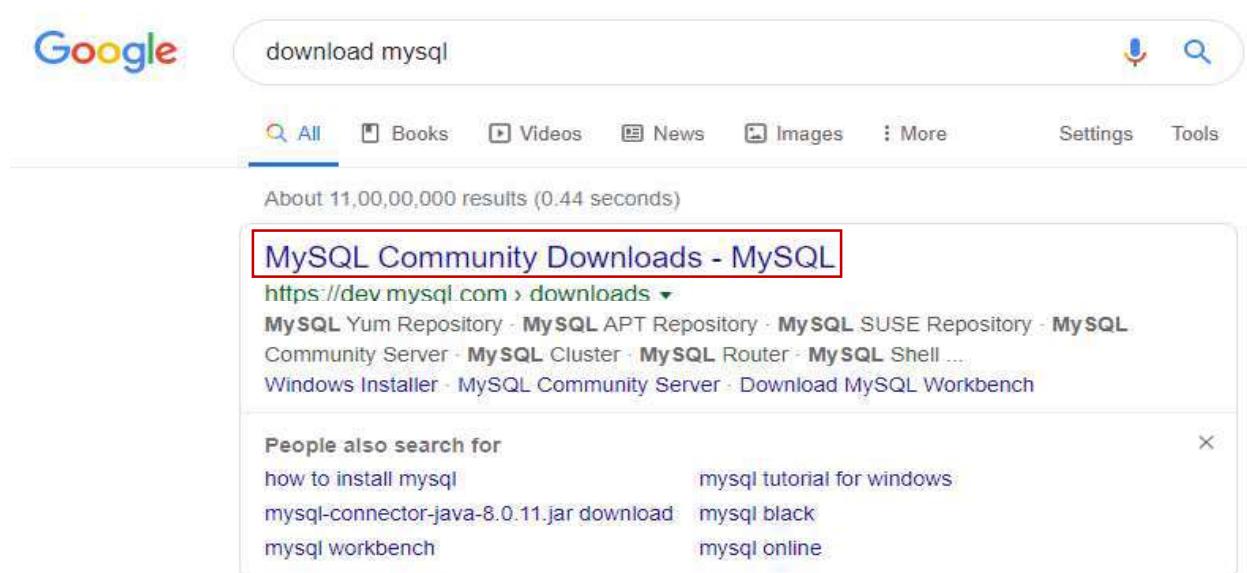
How to run SQL Query on the local system

To run the SQL query on the local system, we need to install the MYSQL community server on the system. We have given step by step installation process below.

2. Downloading and Installing MySQL

2.1 Downloading MySQL

Step 1: Open Google and type **Download MySQL** and Click on **MySQL Community Downloads**



Step 2: Click on MySQL Community Server

④ MySQL Community Downloads

- MySQL Yum Repository
- MySQL APT Repository
- MySQL SUSE Repository
- **MySQL Community Server**
- MySQL Cluster
- MySQL Router
- MySQL Router
- MySQL Shell
- MySQL Workbench
- MySQL Installer for Windows
- MySQL for Excel
- MySQL for Visual Studio
- MySQL Notifier
- C API (libmysqlclient)
- Connector/C++
- Connector/J
- Connector/.NET
- Connector/Node.js
- Connector/ODBC
- Connector/Python
- MySQL Native Driver for PHP
- MySQL Benchmark Tool
- Time zone description tables
- Download Archives

Step 3: Click on the MySQL installer MSI [Go to Download Page >](#)

④ [MySQL Community Downloads](#)
↳ MySQL Community Server

General Availability (GA) Releases

MySQL Community Server 8.0.18

Select Operating System: Microsoft Windows ▾ Looking for previous GA versions?

Recommended Download:

MySQL Installer for Windows
All MySQL Products. For All Windows Platforms. In One Package.

Starting with MySQL 8.0, the MySQL installer packages replace the previously MySQL packages.

Windows (x86, 32 & 64-bit), MySQL Installer MSI Go to Download Page >

Other Downloads:

Windows (x86, 64-bit), ZIP Archive (mysql-8.0.18-winx64.zip)	8.0.18	272.3M	Download
Windows (x86, 64-bit), ZIP Archive Debug Binaries & Test Suite (mysql-8.0.18-winx64-debug-test.zip)	8.0.18	402.6M	Download

We suggest that you use the MD5 checksums and GnuPG signatures to verify the integrity of the packages you download.

Step 4: Select the OS and click on **MSI Installer community**

④ [MySQL Community Downloads](#)
↳ MySQL Installer

General Availability (GA) Releases

MySQL Installer 8.0.18

Select Operating System: Microsoft Windows ▾ Looking for previous GA versions?

Windows (x86, 32-bit), MSI Installer
(mysql-installer-web-community-8.0.18.0.msi)

8.0.18 18.6M [Download](#)
MD5: c509966c1033462027a009cc51a98c74 | Signature

Windows (x86, 32-bit), MSI Installer
(mysql-installer-community-8.0.18.0.msi)

8.0.18 415.1M [Download](#)
MD5: 906b5fb4343d487f716f03b5925d8286 | Signature

We suggest that you use the MD5 checksums and GnuPG signatures to verify the integrity of the packages you download.

Step 5: Click on **start my download**

④ [MySQL Community Downloads](#)

Login Now or Sign Up for a free account.

An Oracle Web Account provides you with the following advantages:

- Fast access to MySQL software downloads
- Download technical White Papers and Presentations
- Post messages in the MySQL Discussion Forums
- Report and track bugs in the MySQL bug system

Login »

using my Oracle Web account

Sign Up »

for an Oracle Web account

MySQL.com is using Oracle SSO for authentication. If you already have an Oracle Web account, click the Login link. Otherwise, you can signup for a free account by clicking the Sign Up link and following the instructions.

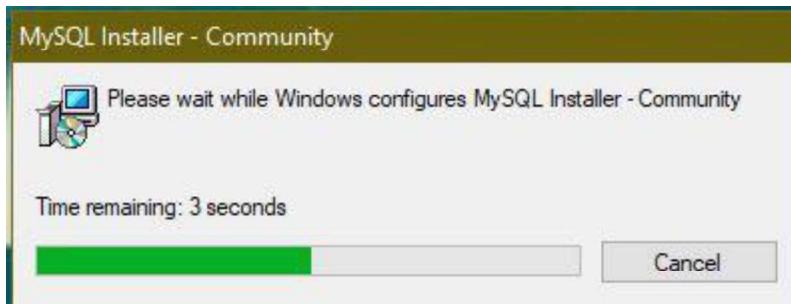
No thanks, just start my download.

Note: Once the Downloading is completed, then double-click on that and install it on the local system.

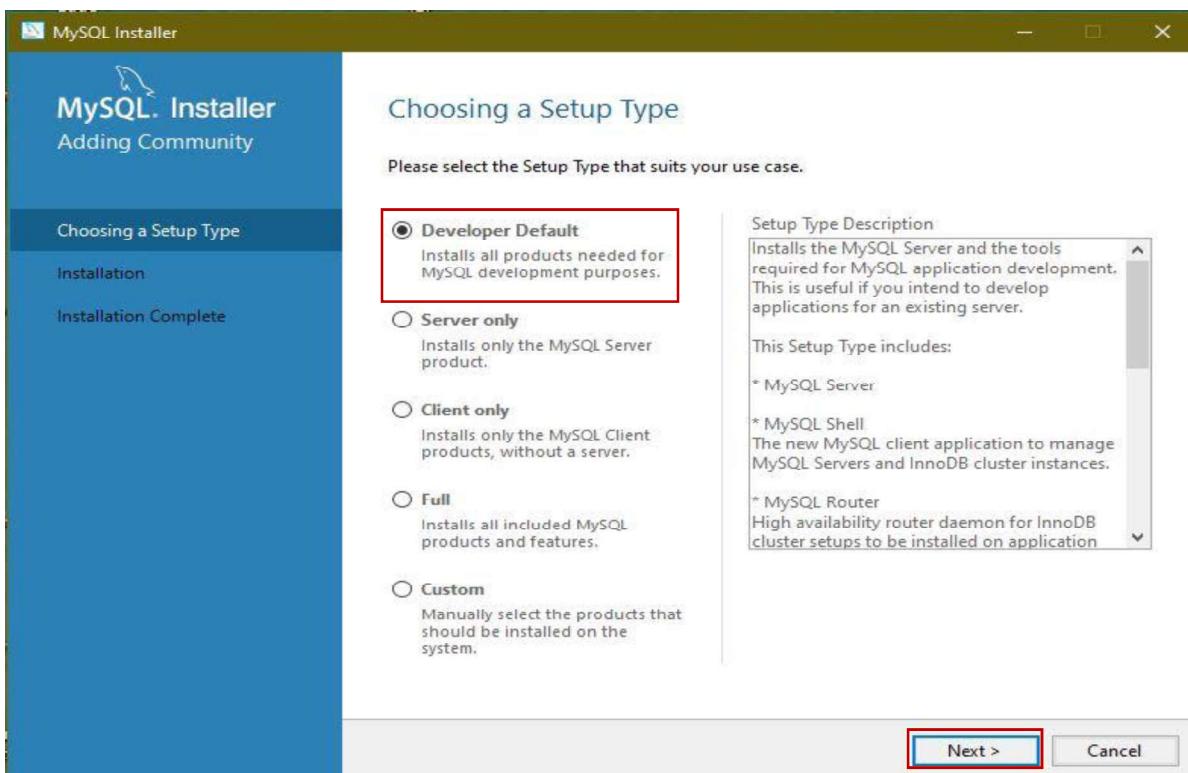
2.2. Installation of MySQL

Step 1: Double-Click on Downloaded Application.

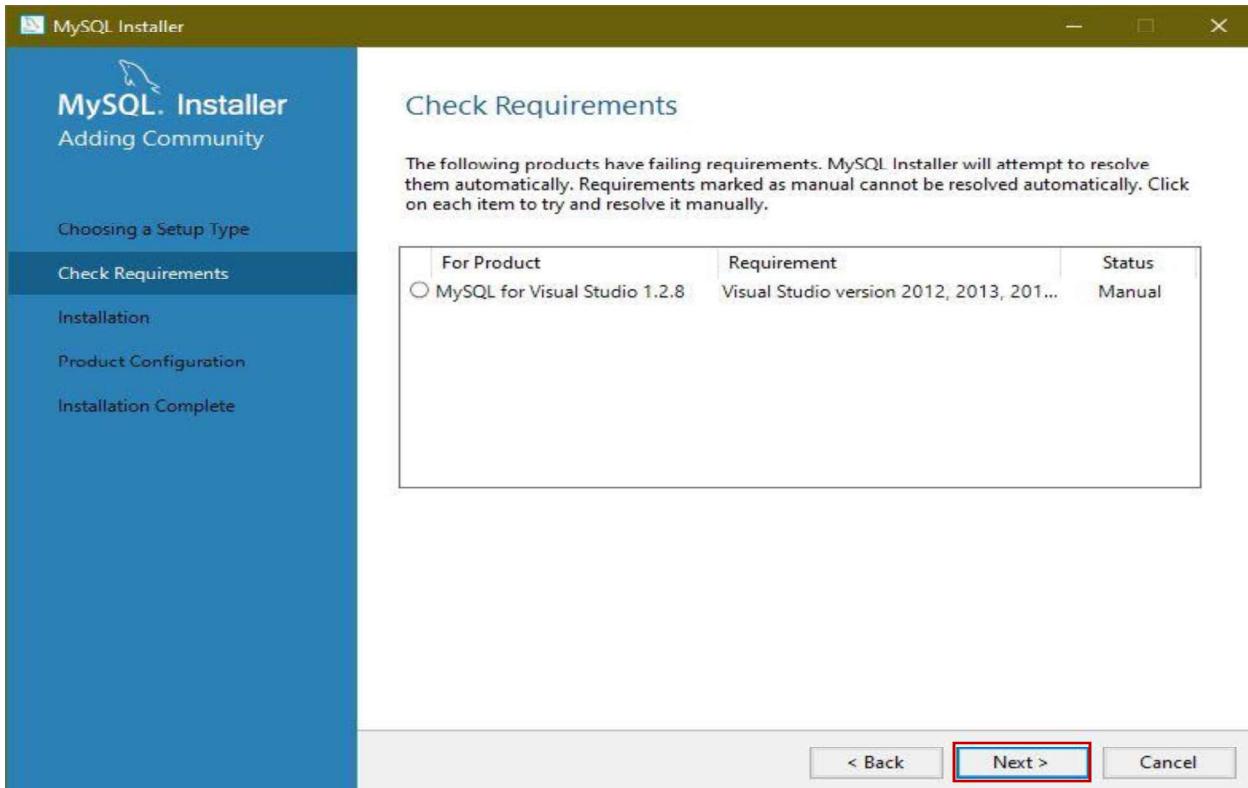
Step 2: After clicking on the application we will get a window like below



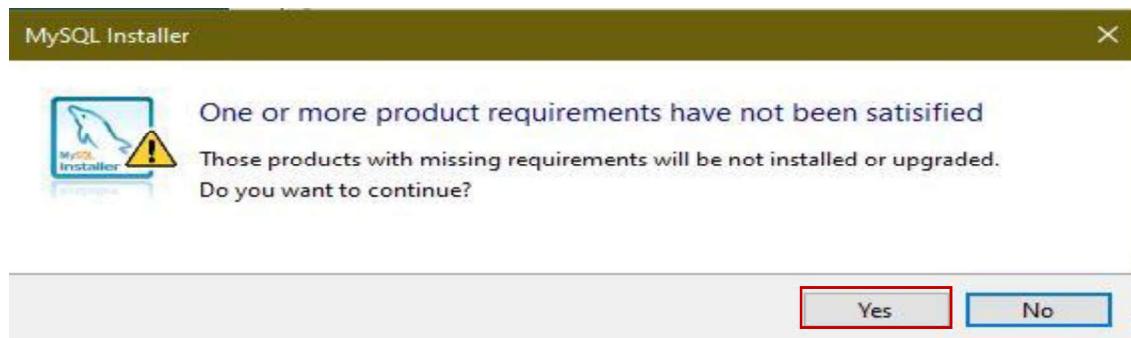
Step 3: Choosing the Setup type and click Next.



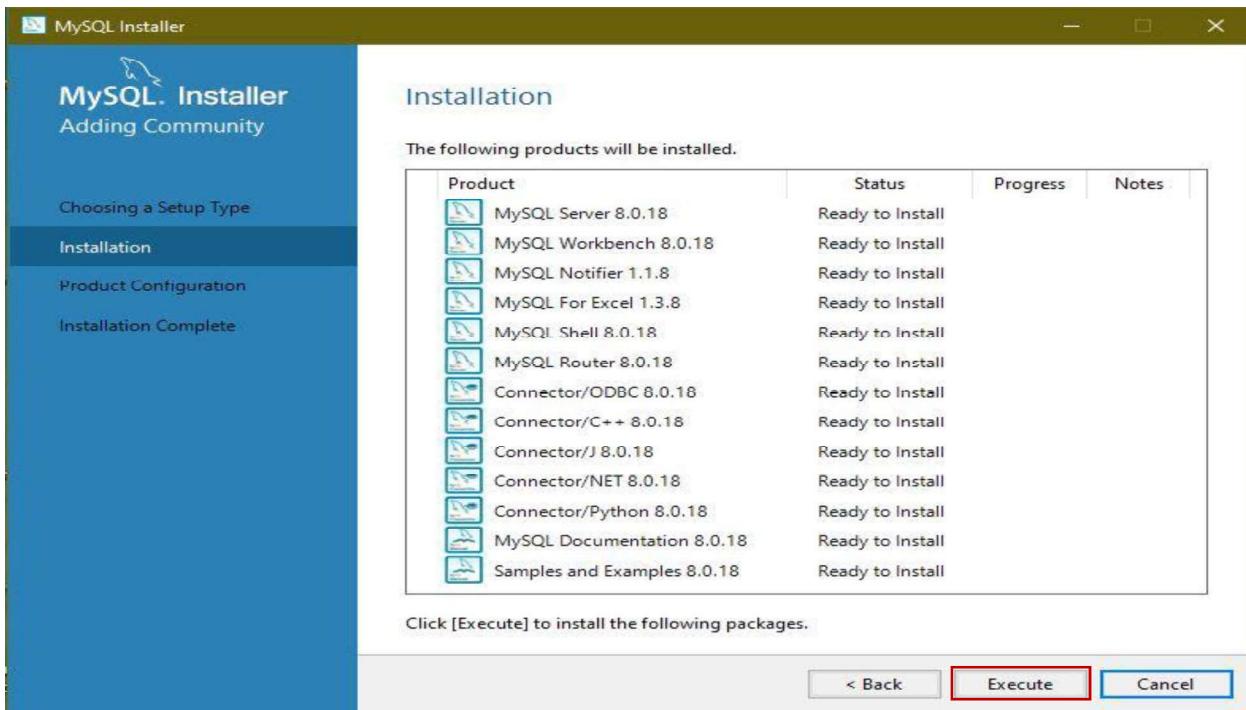
Setup 4: Click Next.



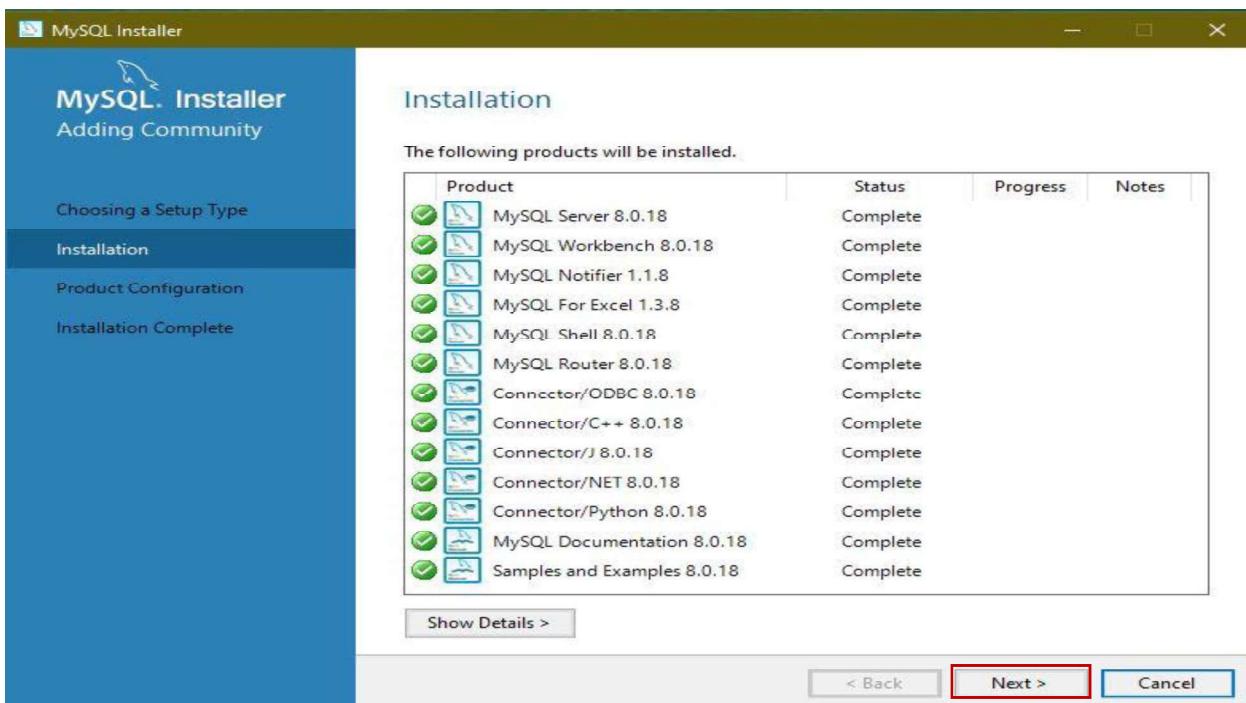
Step 5: Click Yes.



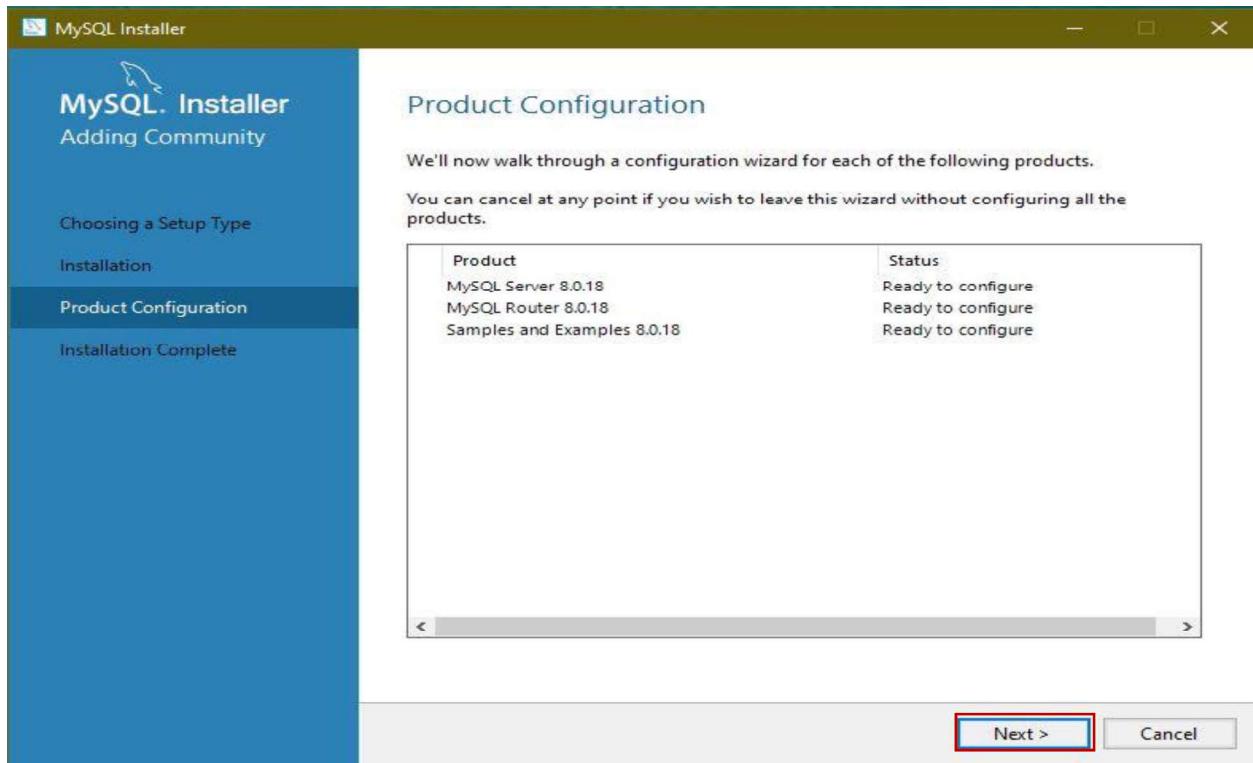
Step 6: Click Execute.



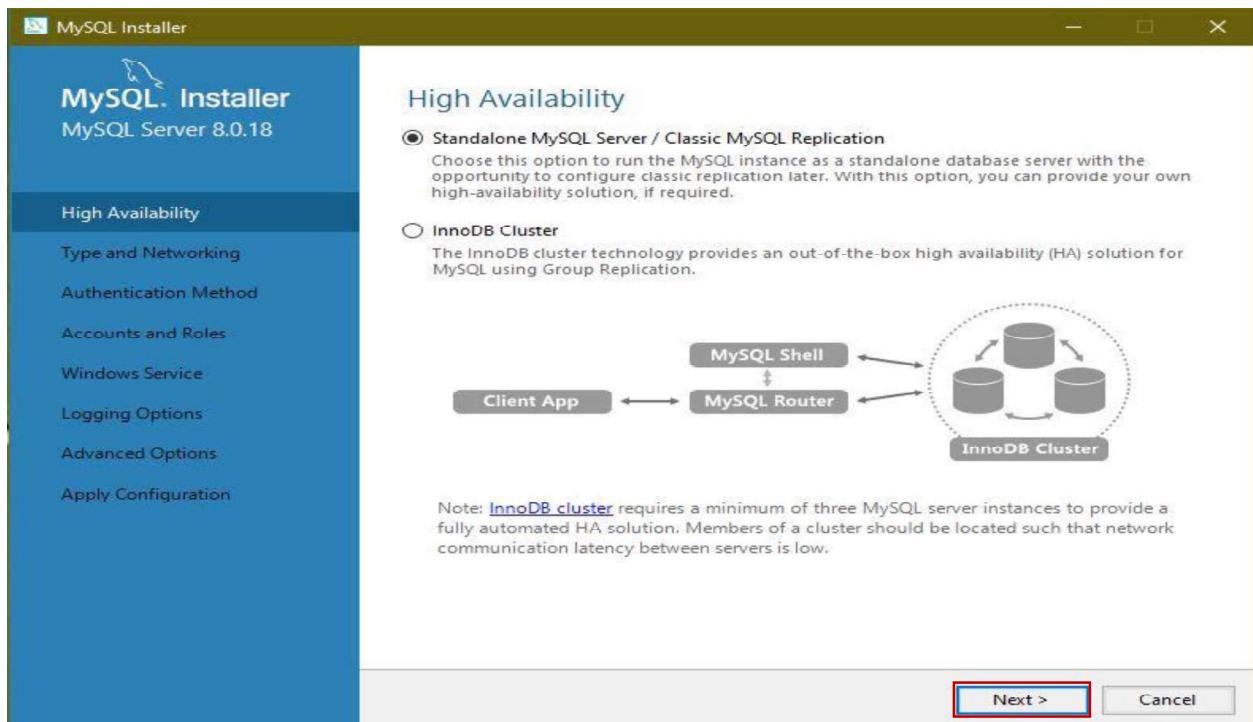
Step 7: After Execution, click on the Next.



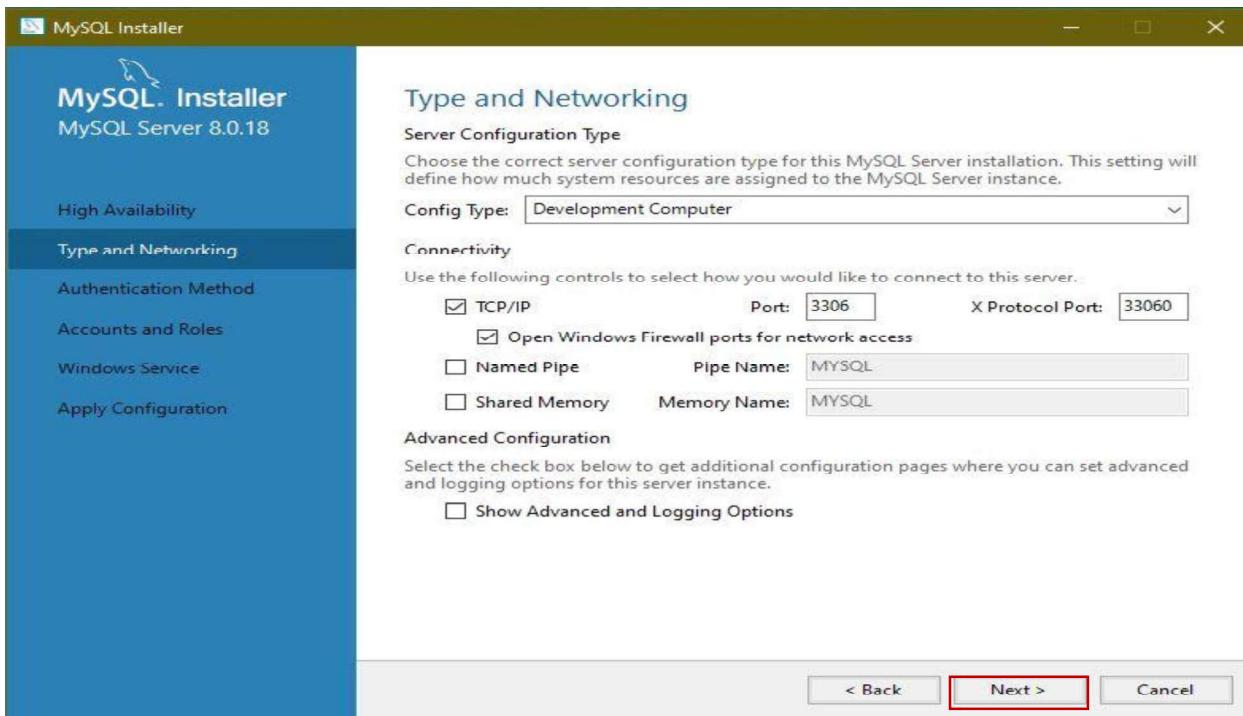
Step 8: Click Next.



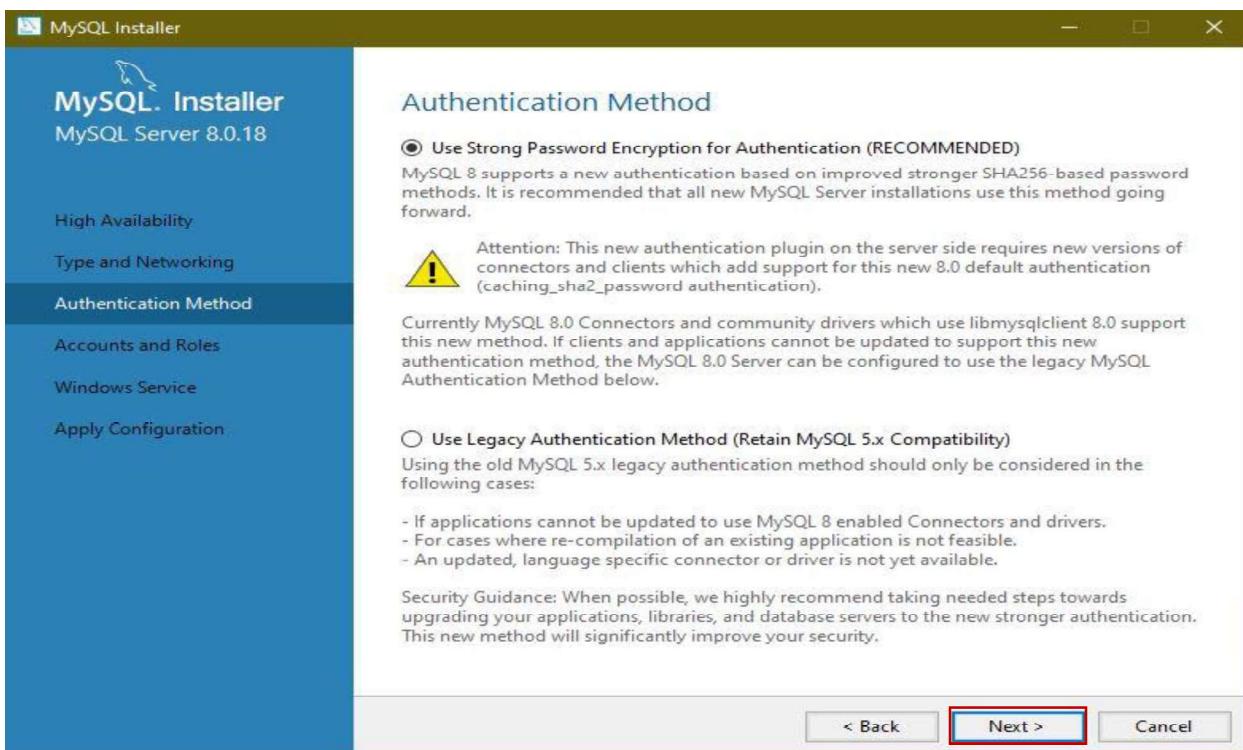
Step 9: Click Next.



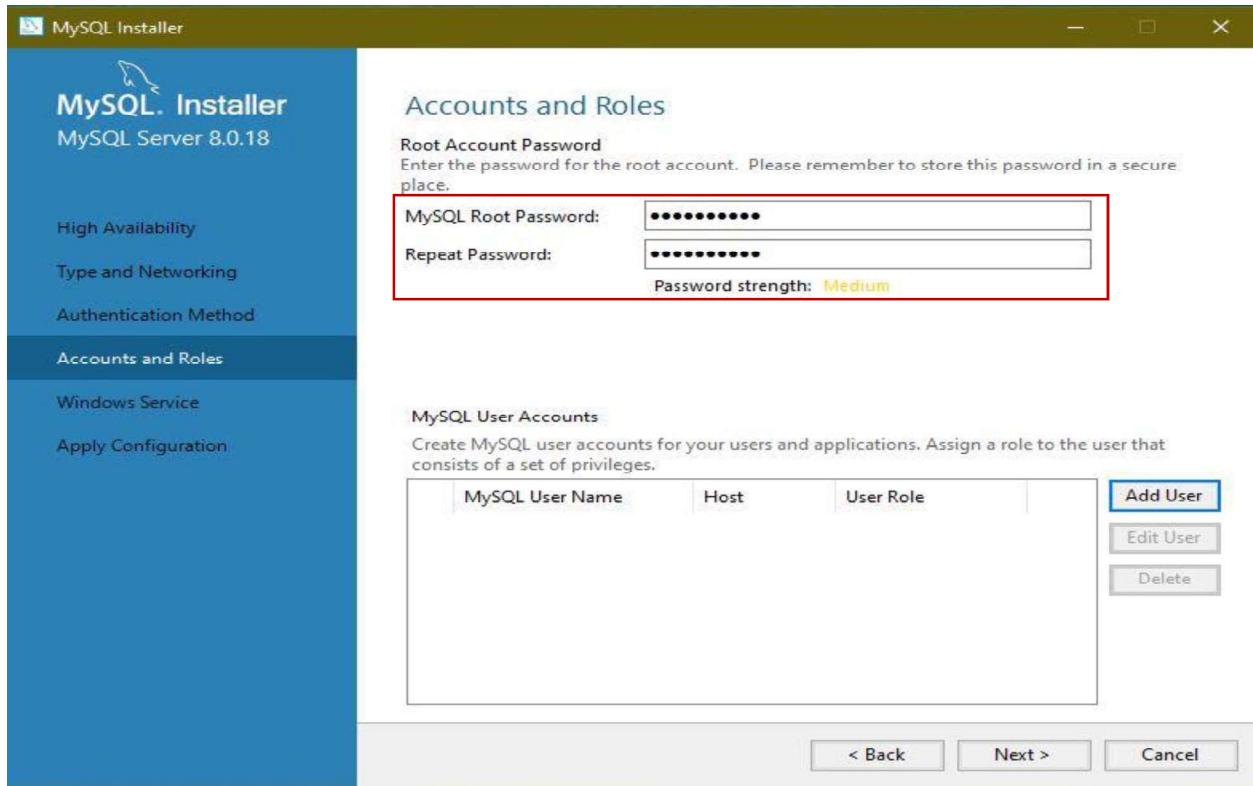
Step 10: Leave it as default and click Next.



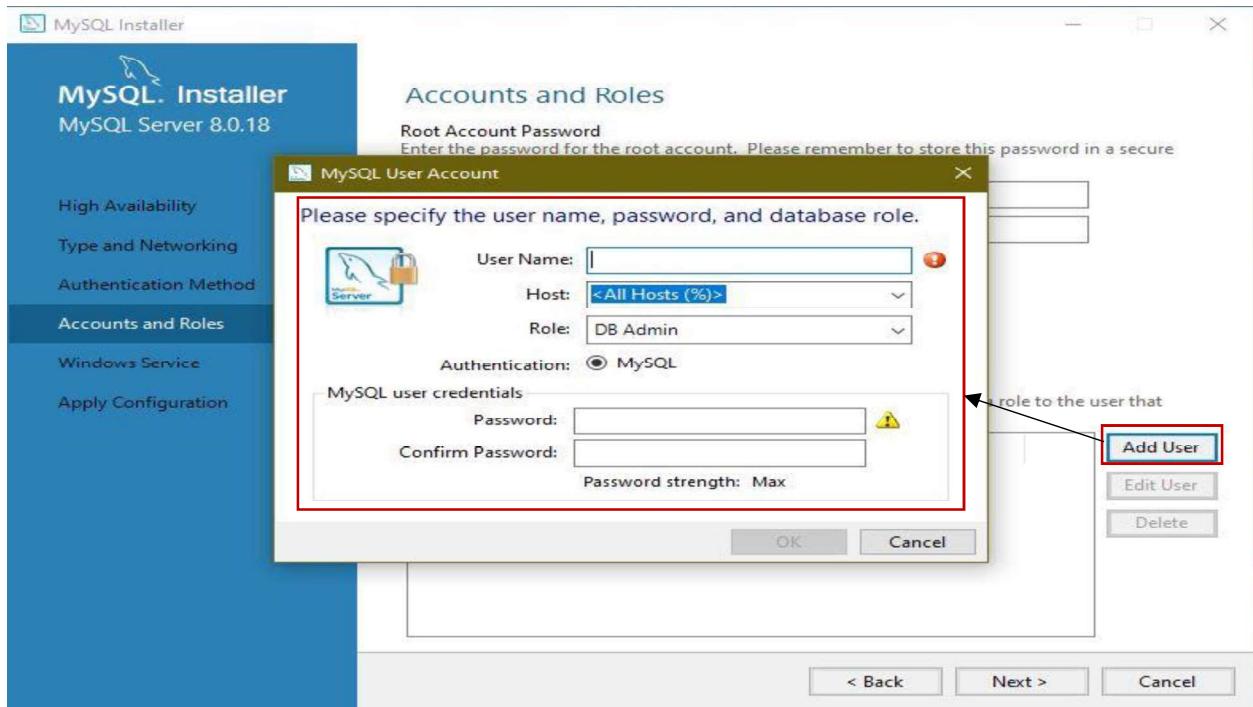
Step 11: Click Next



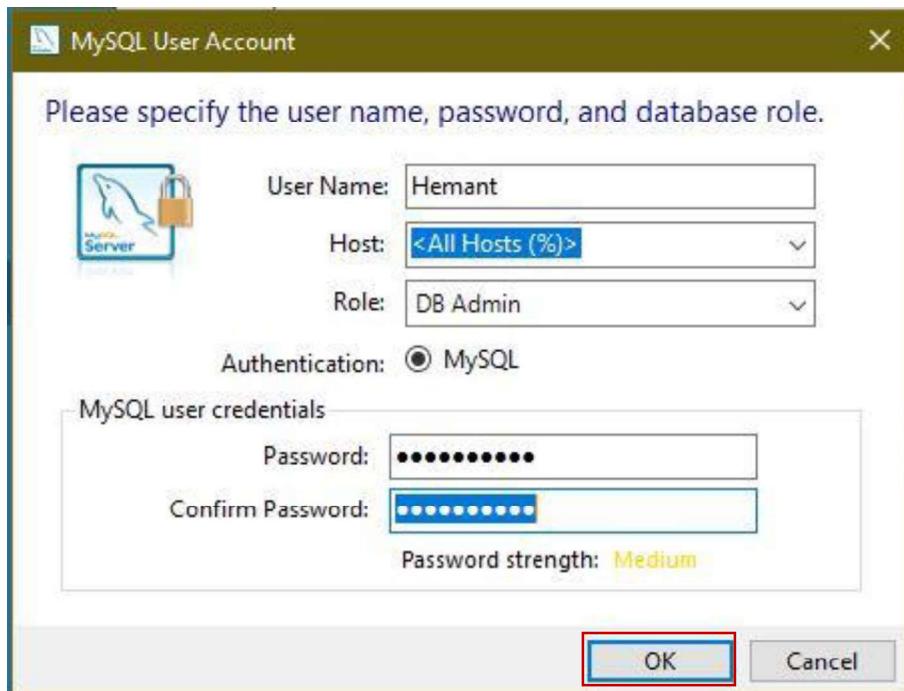
Step 12: Choose the root password



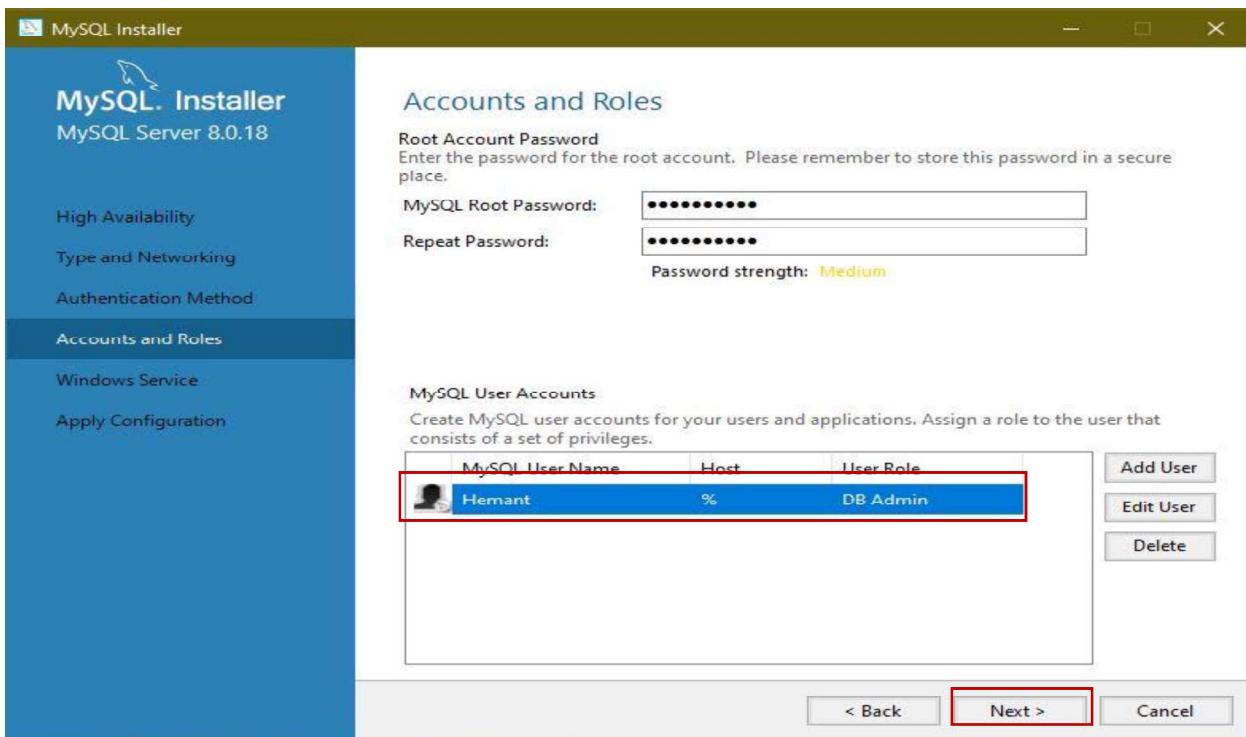
Step 13: Click on Add User and give the username and password.



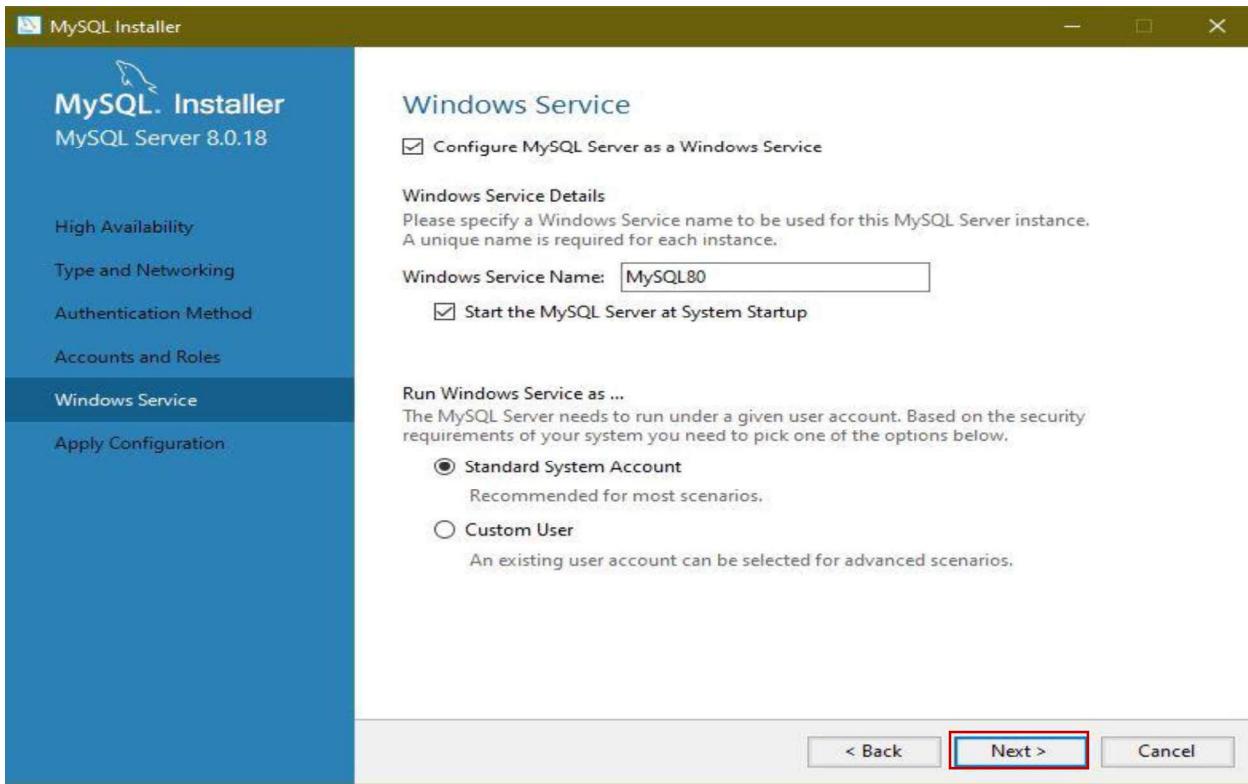
Step 14: After inserting the name and password click OK



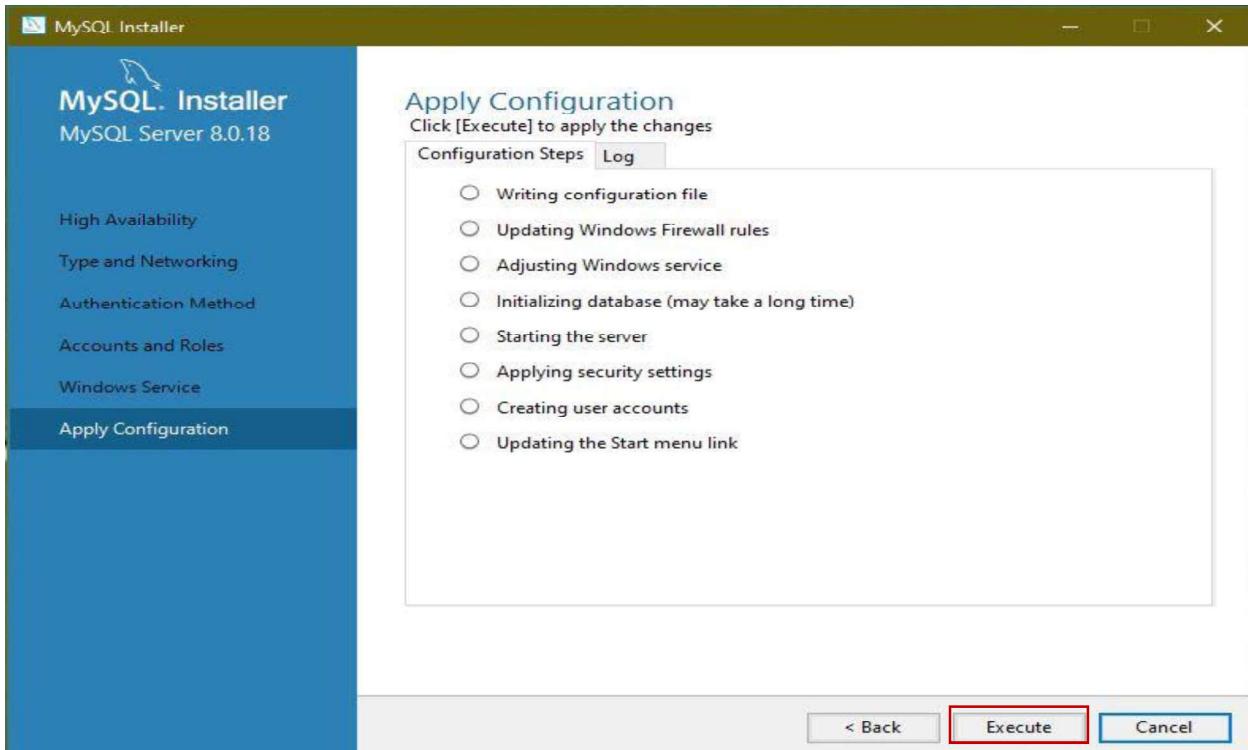
Step 15: After adding the user click Next



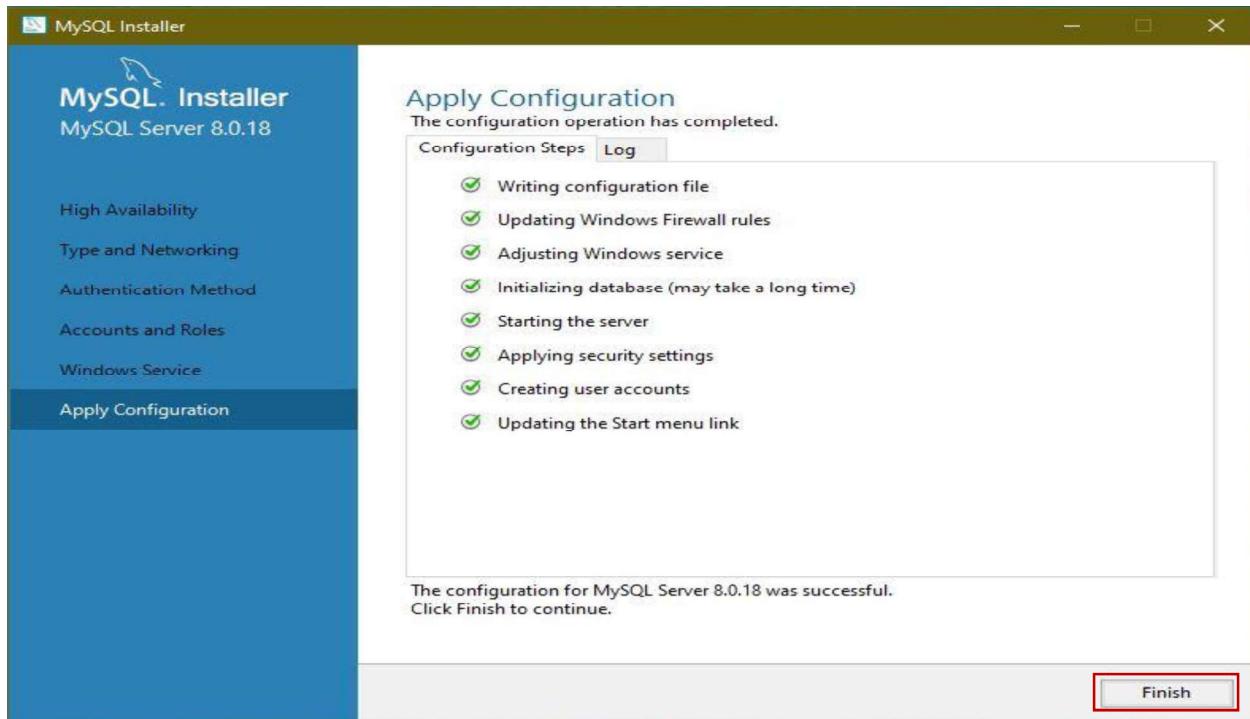
Step 16: Click Next



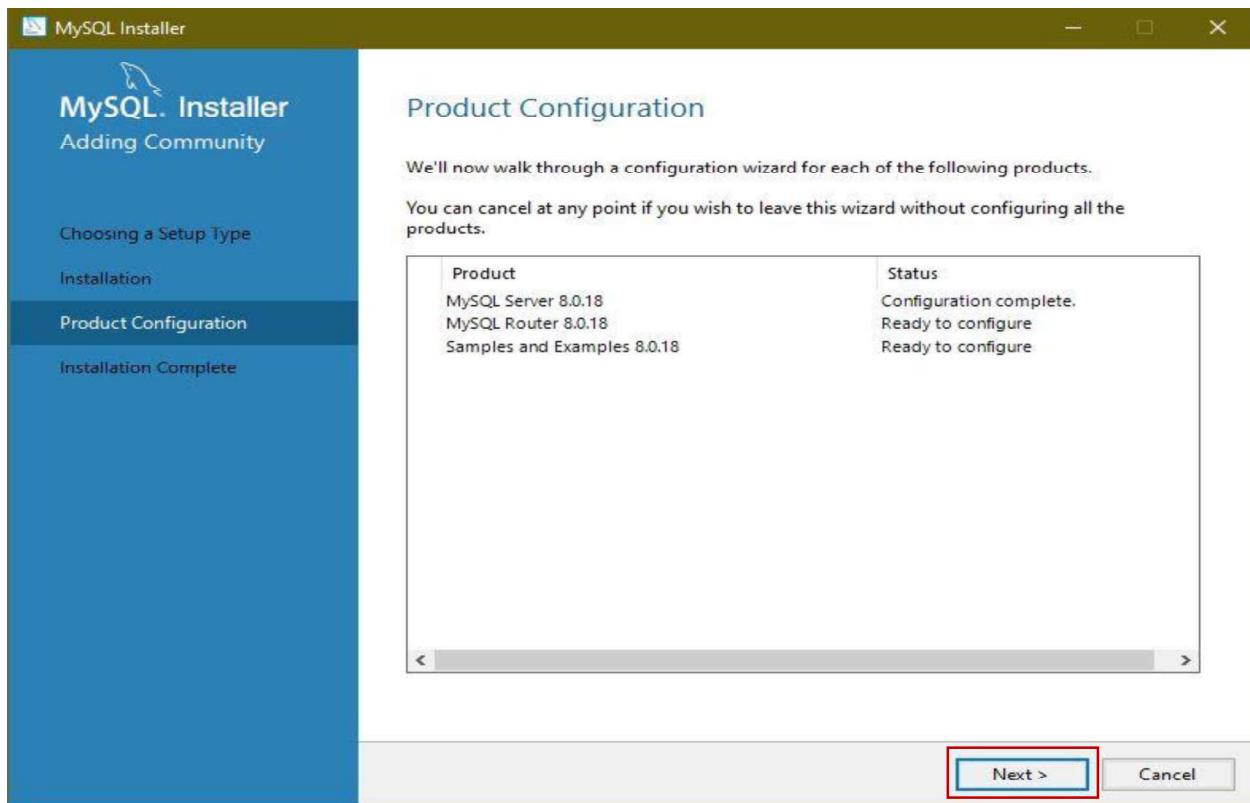
Step 17: Click on Execute



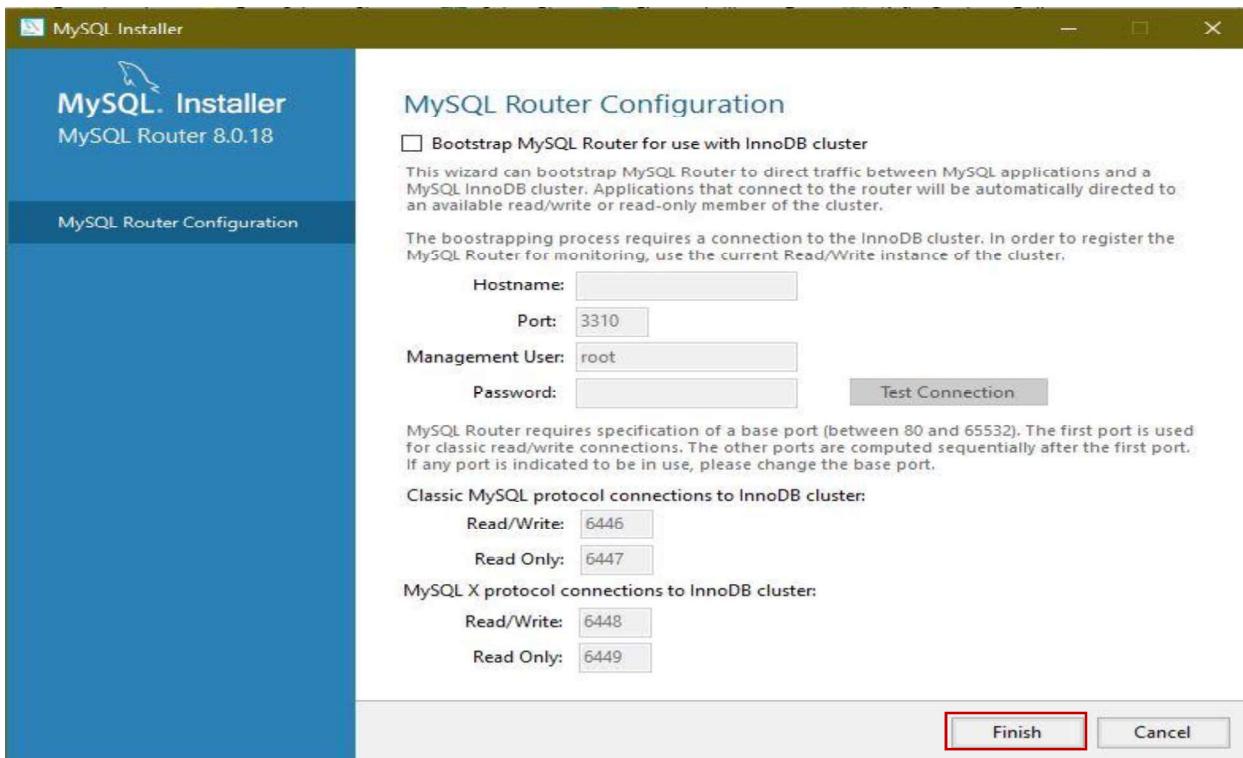
Step 18: After Clicking on execute, click Finish



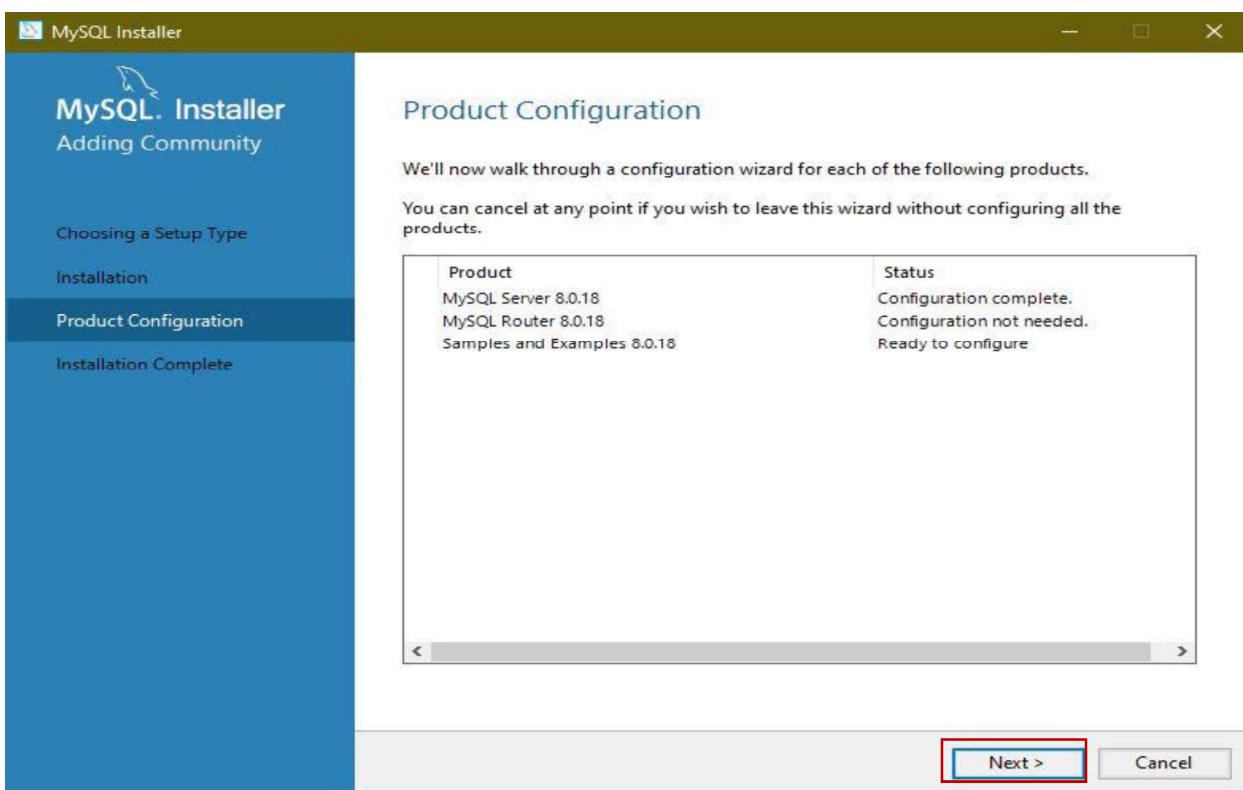
Step 19: Click Next



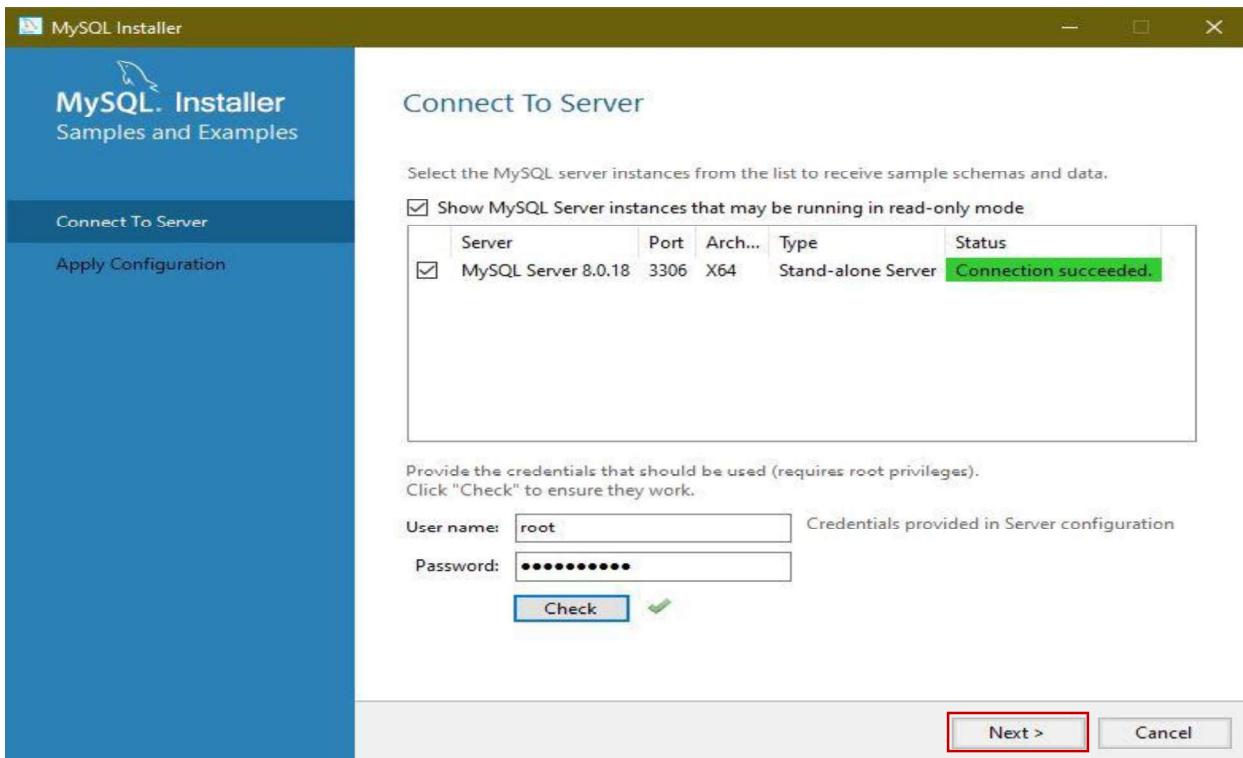
Step 20: Click on Finish



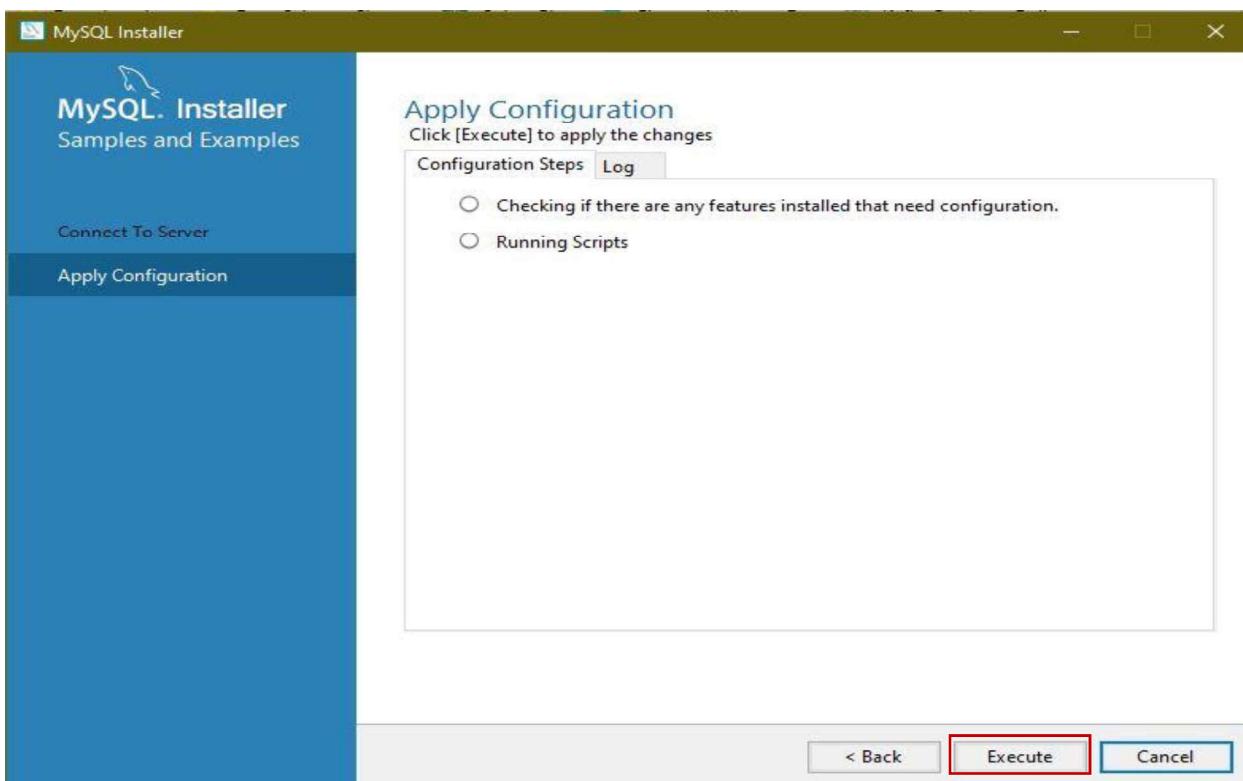
Step 21: Click Next.



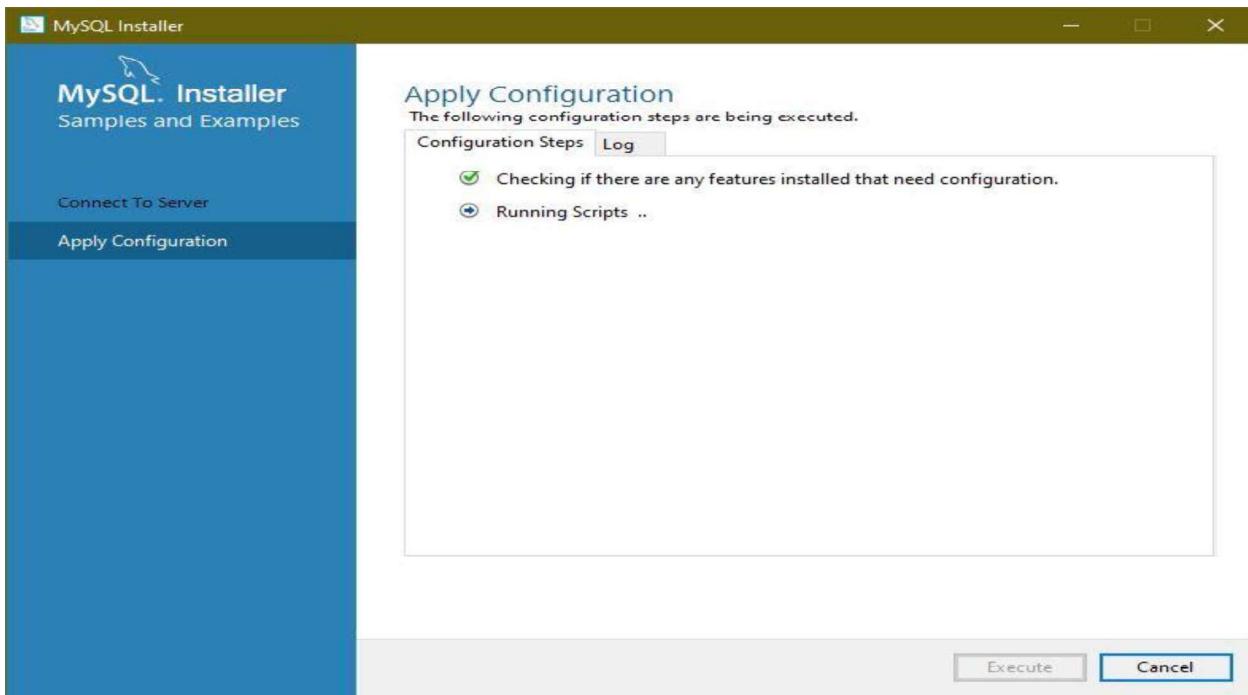
Step 22: Check the password and Click Next



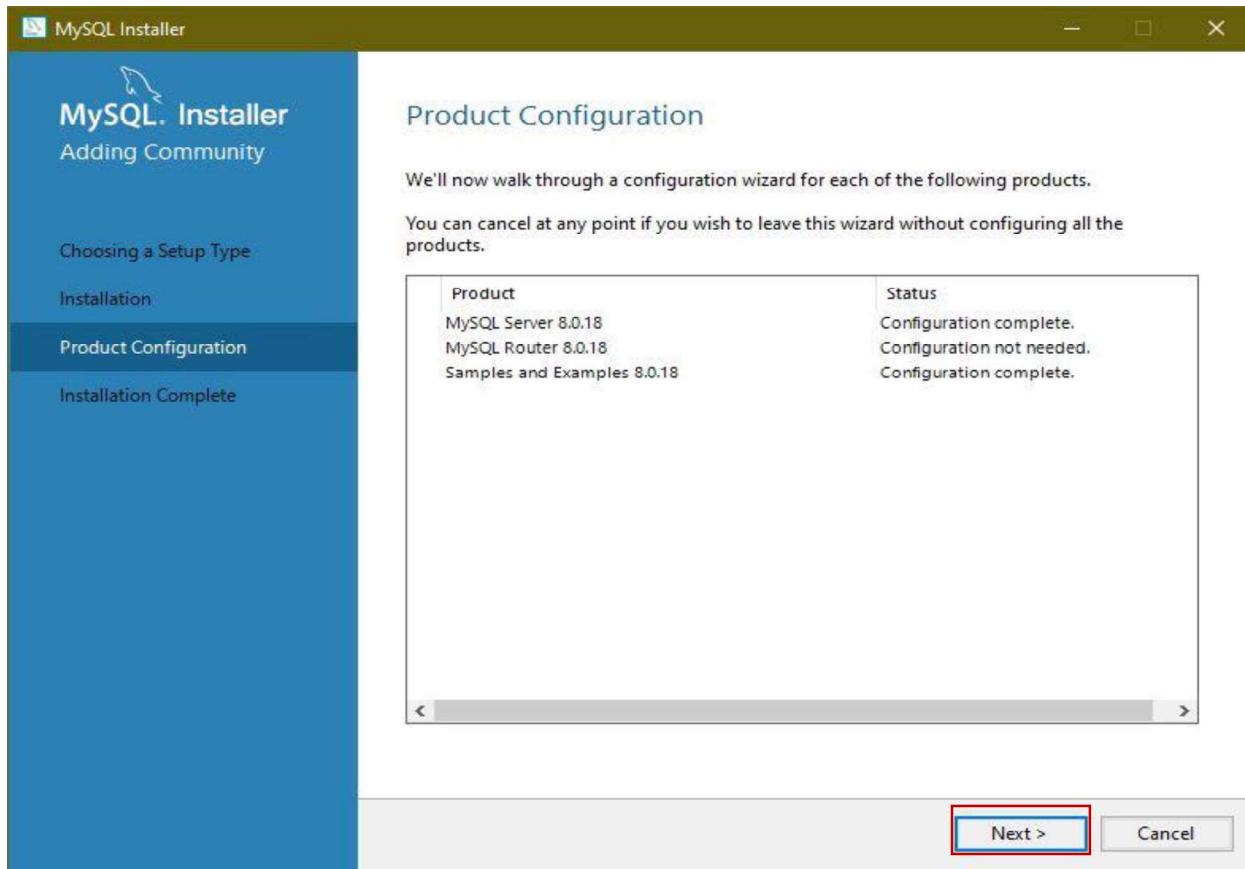
Step 23: Click Execute



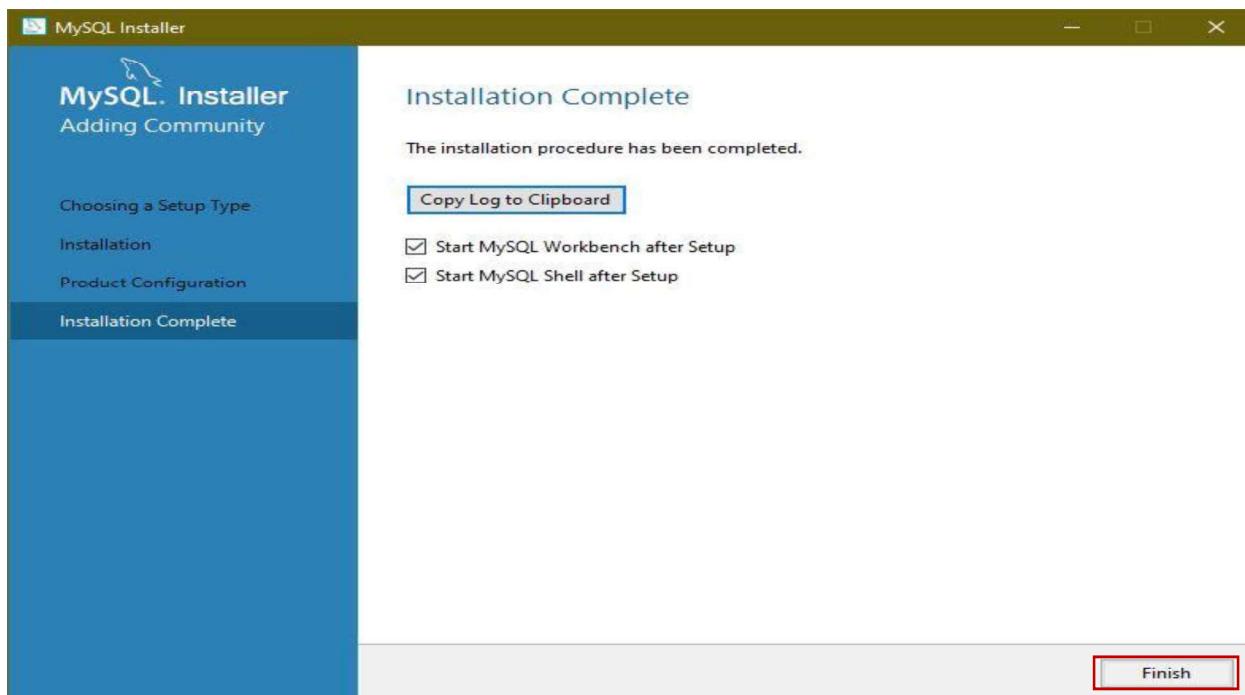
Step 24: After clicking on Execute



Step 25: Click Next



Step 26: Click Finish

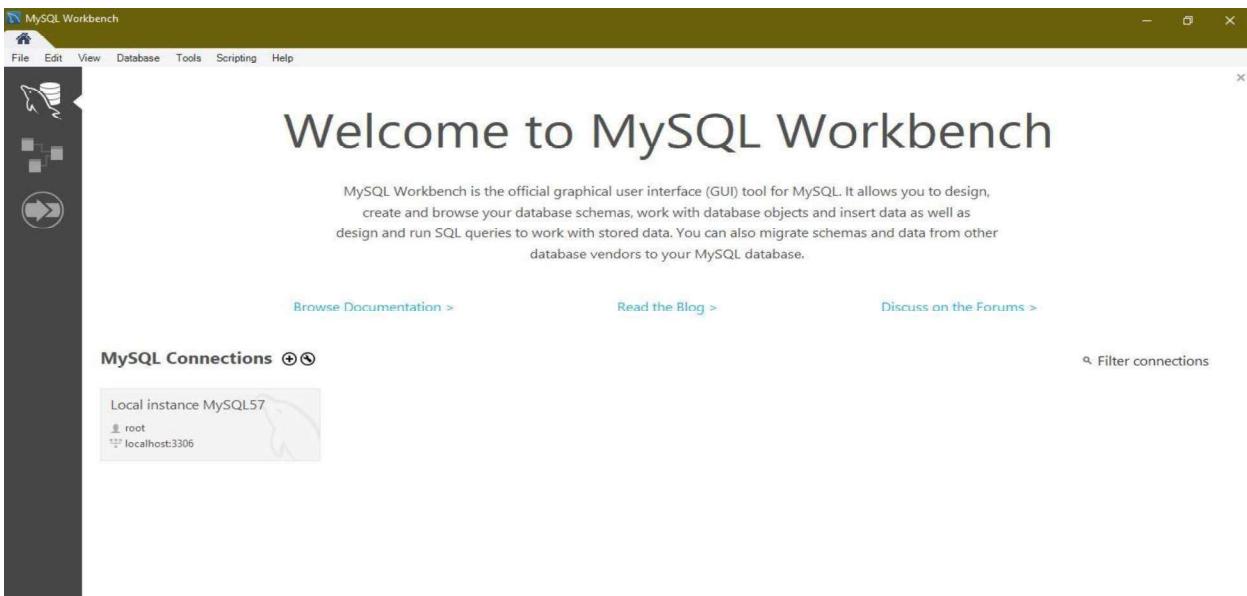


Step 27: After the successful installation of MySQL, two windows will open.

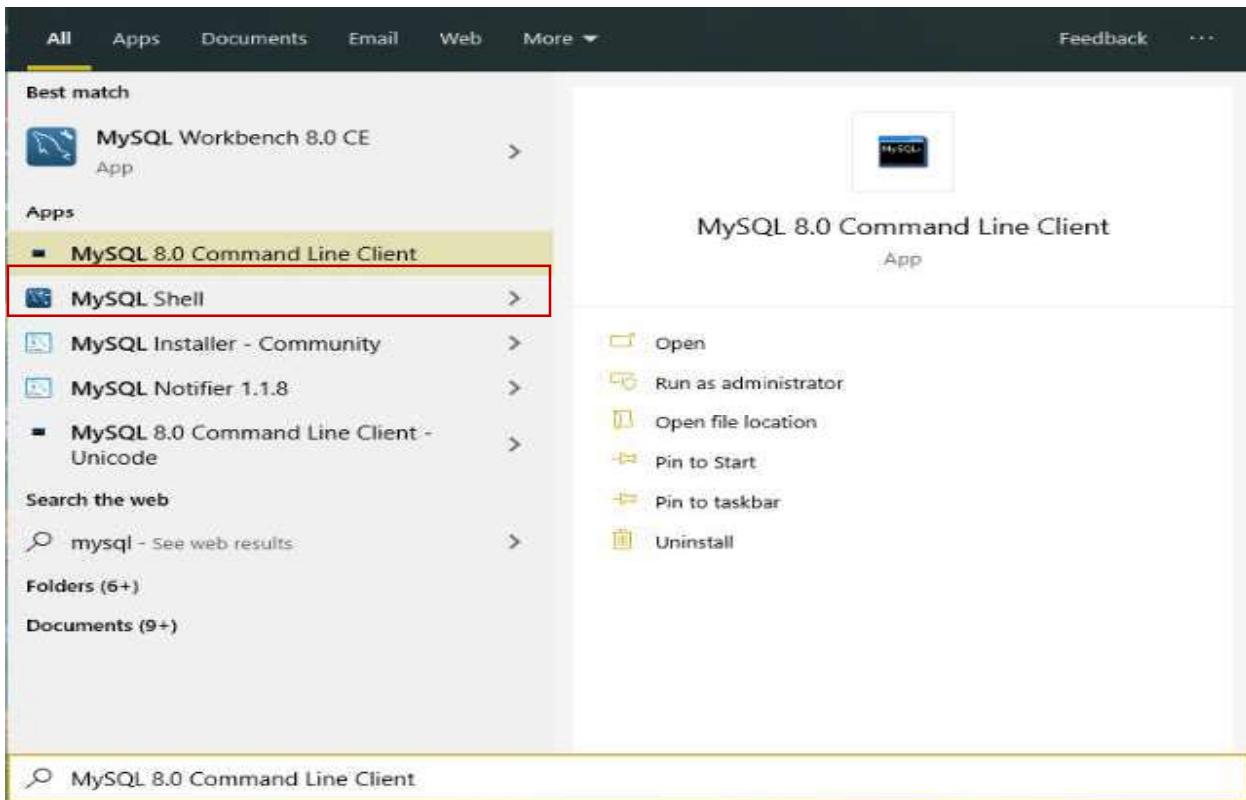
- MySQL Shell
- MySQL WorkBench



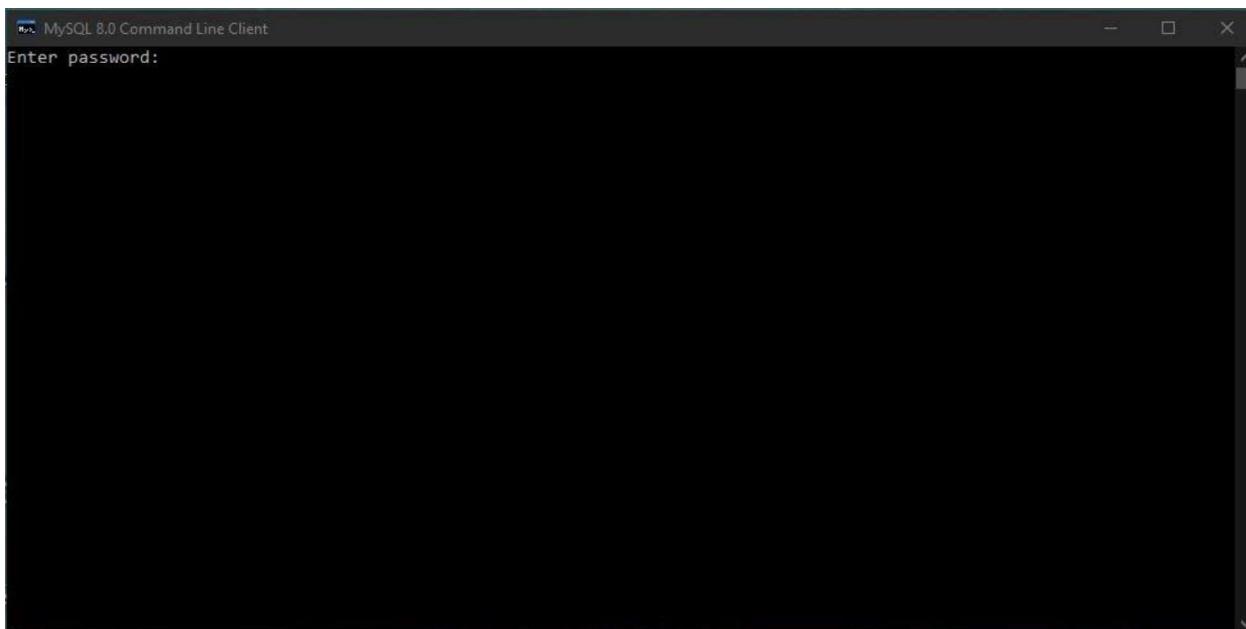
MySQL WorkBench will tell about database connectivity and other features of MySQL.



Step 28: Click on window Button and search for Open MySQL Command.



Step 29: Open MySQL Command-line Client and enter the password.



Step 29: After entering the password, your MySQL client will get connected with MySQL.

```
MySQL 8.0 Command Line Client
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 15
Server version: 8.0.18 MySQL Community Server - GPL

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

Step 30: There are many in-build Databases in MySQL; we can type **show database**.

```
MySQL 8.0 Command Line Client

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sakila |
| sys |
| world |
+-----+
6 rows in set (0.00 sec)

mysql>
```

Step 31: we can use any of the above databases by just typing **use database _name**

```
mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sakila |
| sys |
| world |
+-----+
6 rows in set (0.03 sec)

mysql> use sakila;
Database changed
```

3. SQL QUERY

A database most often contains tables. Some name identifies each table. The table includes records(rows) with Data. To access those records, we need SQL Syntax. Most of the action you need to perform Database by using the SQL Statement.

Note: SQL keywords are not case-sensitive (e.g., select as SELECT)

- o The syntax of the language describes the language element.
- o SQL syntax is somewhat like simple English sentences.
- o Keywords include SELECT, UPDATE, WHERE, ORDER BY ETC.

Four fundamental operations that can apply to any databases are:

1. Read the Data -- **SELECT**
2. Insert the new Data -- **INSERT**
3. Update existing Data -- **UPDATE**
4. Remove Data –**DELETE**

These operations are referred to as the **CRUD** (Create, Read, Update, Delete).

The SQL SELECT QUERY

The SELECT statement permits you to read data from one or more tables.

The general syntax is:

```
SELECT first_name, last_name
```

```
FROM customer;
```

Example: Read the first_name and last_name from table **customer**.

```
mysql> select first_name, last_name from customer;
+-----+-----+
| first_name | last_name |
+-----+-----+
| MARY       | SMITH      |
| PATRICIA   | JOHNSON    |
| LINDA      | WILLIAMS   |
| BARBARA    | JONES      |
| ELIZABETH  | BROWN      |
| JENNIFER   | DAVIS      |
| MARIA      | MILLER     |
| SUSAN      | WILSON     |
| MARGARET   | MOORE      |
| DOROTHY    | TAYLOR     |
| LISA       | ANDERSON   |
| NANCY      | THOMAS     |
| KAREN      | JACKSON    |
| BETTY      | WHITE      |
| HELEN      | HARRIS     |
| SANDRA     | MARTIN     |
| DONNA      | THOMPSON   |
| CAROL      | GARCIA     |
| RUTH       | MARTINEZ   |
| SHARON     | ROBINSON   |
| MICHELLE   | CLARK      |
| LAURA      | RODRIGUEZ  |
| SARAH      | LEWIS      |
| KIMBERLY   | LEE        |
+-----+-----+
```

To select all columns, use *

```
SELECT *
```

```
FROM customer;
```

```
mysql> select * from customer;
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| customer_id | store_id | first_name | last_name | email           | address_id | active | create_date | last_update |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
| 1          | 1        | MARY       | SMITH      | MARY.SMITH@sakilacustomer.org | 5          | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 2          | 1        | PATRICIA  | JOHNSON    | PATRICIA.JOHNSON@sakilacustomer.org | 6          | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 3          | 1        | LINDA      | WILLIAMS   | LINDA.WILLIAMS@sakilacustomer.org | 7          | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 4          | 2        | RARRARA    | JONFS      | RARRARA.JONFS@sakilacustomer.org | 8          | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 5          | 1        | ELIZABETH  | BROWN      | ELIZABETH.BROWN@sakilacustomer.org | 9          | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 6          | 2        | JENNIFER   | DAVIS      | JENNIFER.DAVIS@sakilacustomer.org | 10         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 7          | 1        | MARIA      | MILLER     | MARIA.MILLER@sakilacustomer.org | 11         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 8          | 2        | SUSAN      | WILSON     | SUSAN.WILSON@sakilacustomer.org | 12         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 9          | 2        | MARGARET   | MOORE      | MARGARET.MOORE@sakilacustomer.org | 13         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 10         | 1        | DOROTHY    | TAYLOR     | DOROTHY.TAYLOR@sakilacustomer.org | 14         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 11         | 2        | LISA       | ANDERSON   | LISA.ANDERSON@sakilacustomer.org | 15         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 12         | 1        | NANCY      | THOMAS     | NANCY.THOMAS@sakilacustomer.org | 16         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 13         | 2        | KAREN      | JACKSON    | KAREN.JACKSON@sakilacustomer.org | 17         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 14         | 2        | BETTY      | WHITE      | BETTY.WHITE@sakilacustomer.org | 18         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 15         | 1        | HELEN      | HARRIS     | HELEN.HARRIS@sakilacustomer.org | 19         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 16         | 2        | SANDRA     | MARTIN    | SANDRA.MARTIN@sakilacustomer.org | 20         | 0      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 17         | 1        | DONNA      | THOMPSON   | DONNA.THOMPSON@sakilacustomer.org | 21         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 18         | 2        | CAROL      | GARCIA    | CAROL.GARCIA@sakilacustomer.org | 22         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 19         | 1        | RUTH       | MARTINEZ   | RUTH.MARTINEZ@sakilacustomer.org | 23         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
| 20         | 2        | SHARON     | RORTISON   | SHARON.RORTISON@sakilacustomer.org | 24         | 1      | 2006-02-14 22:04:36 | 2006-02-15 04:57:20 |
+-----+-----+-----+-----+-----+-----+-----+-----+-----+-----+
```