

Introduction & Operations in SQL

Session Objectives:

- ✓ Understand what databases are and why they matter
- ✓ Differentiate between various types of databases
- ✓ Grasp the importance and use of SQL in real-world scenarios
- ✓ Get familiar with SQL installation and the Mysql Workbench interface
- ✓ Import datasets into MySQL Workbench
- ✓ Use SELECT statements to explore data
- ✓ Understand and apply the DESCRIBE function
- ✓ Recognise SQL data types
- ✓ Use the WHERE clause for filtering

What is Raw Data?

-> Missing Values, Incorrect Format, Heterogenous [Mixed Info]

-> Uncleaned/Unstructured data that can be transformed into insights.

What is Database?

→ Table Format [Structured Data] [rows & Columns Format]

↓
Homogeneous
[Same Data Type]

A Database is an organized collection of data.

1. Efficient Storage
2. Quick Retrieval
3. Easy Management & Modification

What is SQL?

→ A Structured Query Language

What is Language?



We require Common Language to communicate

Programming Language

- C++
- Java
- Python
- C, C#
- Ruby
- JavaScript

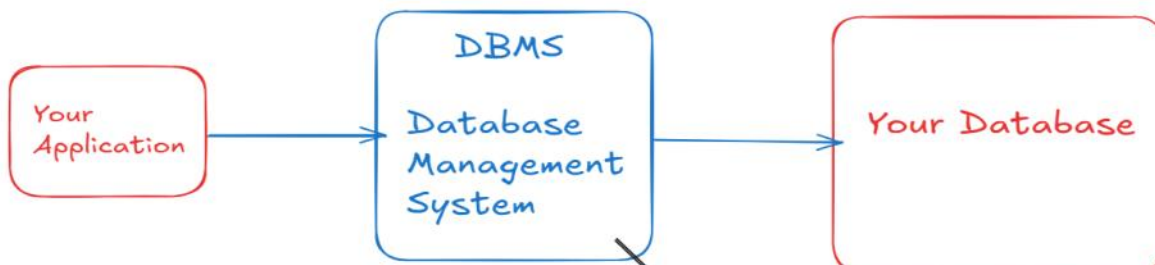
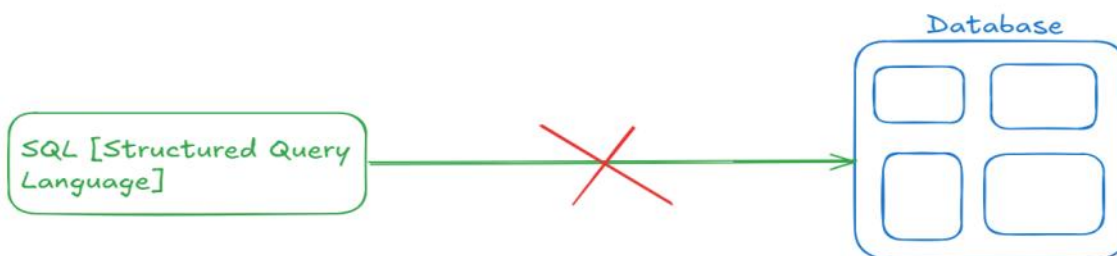
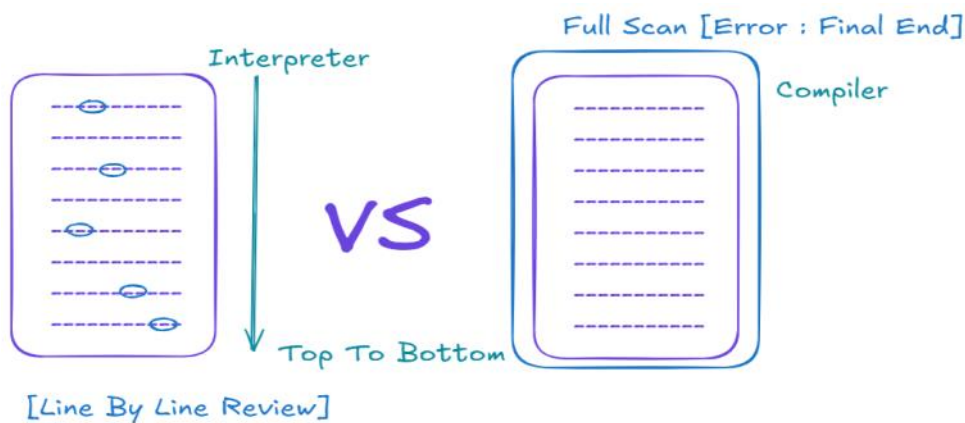
[Syntax]

Interpreter
Compiler

To pass the set of Instruction

Machine

0/1
Binary
Format



RDBMS [Relational Database Management System]

- MySQL ✓
- SQLite
- PostgreSQL
- SQL Server

CRUD Operation

C - Create
R - Read
U - Update
D - Delete

Application

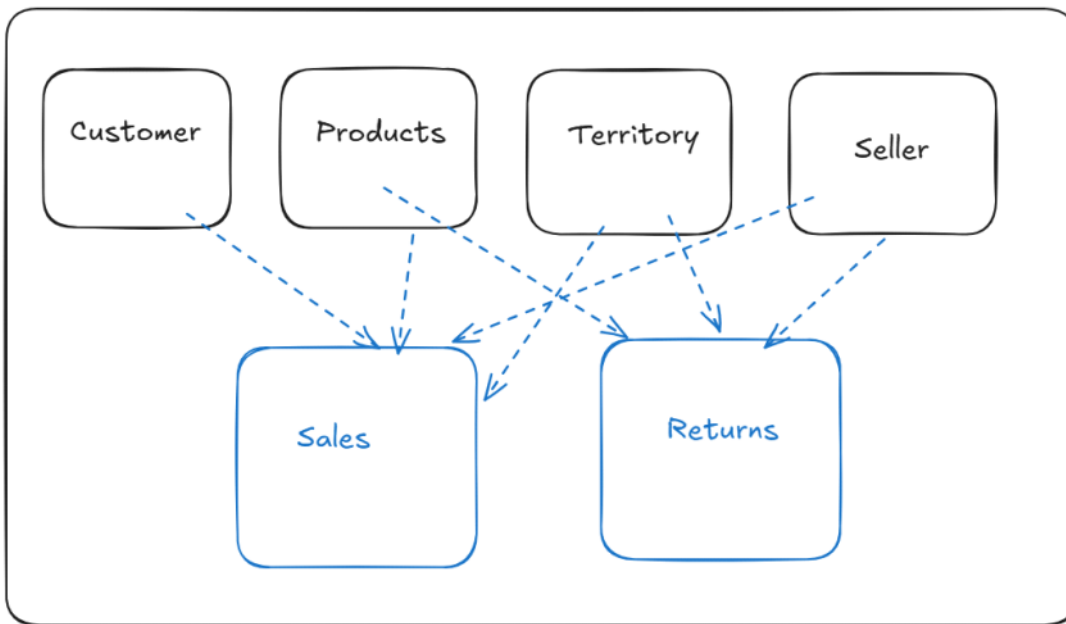
M - MongoDB [NoSQL]
E - Express.JS [BackEnd]
R - React.JS [FrontEnd Framework]
N - Node.js [BackEnd]

DBA - Database Administrator

Instagram

- Create an account.
- Create a Reels/Post/Story.
- Scroll the Reels / Other Post.
- Update the Post.
- Editing the Caption / Bio.
- Delete the Post.
- Delete the Account.

Schemas

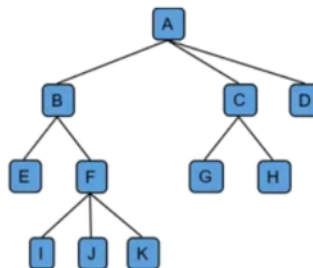


SQL -> JOINS

1. INNER JOIN
2. LEFT JOIN
3. RIGHT JOIN
4. SELF JOIN
5. CROSS JOIN

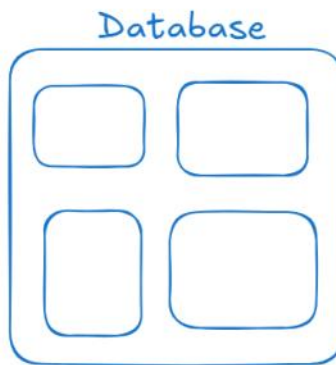
Types of Database:

1. Relational Database[RDBMS] ✓
2. Hierarchical Database
[Only One Parent]
[To store data in rigid Structure]
Eg: [IBM IMS , window Registry]
3. Network Database
[Similar to Hierarchy]
[M:M Relationship]
4. NoSQL Database [Not only SQL]
Unstructured/Semi-structured data
[MongoDB]



Your Database:

Tablenames	Records
<u>Customers</u>	91
<u>Categories</u>	8
<u>Employees</u>	10
<u>OrderDetails</u>	518
<u>Orders</u>	196
<u>Products</u>	77
<u>Shippers</u>	3
<u>Suppliers</u>	29



SQL Statement:

```
SELECT * FROM Customers;
```

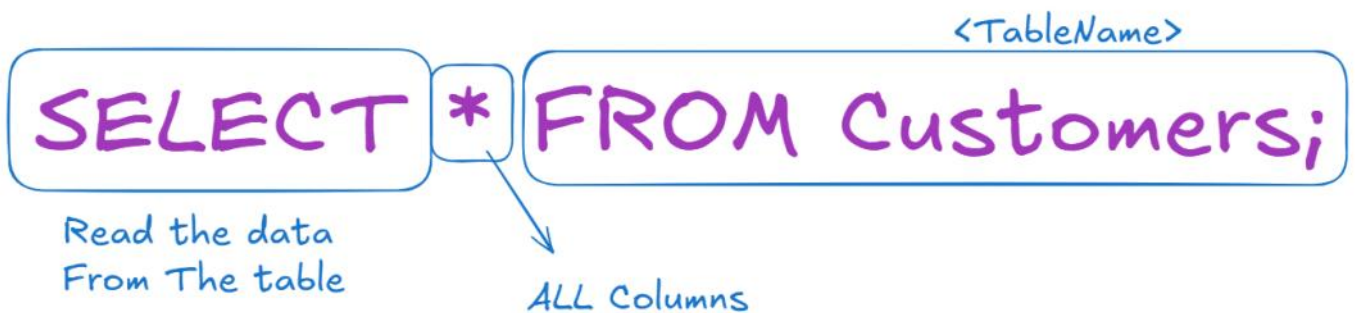
Write SQL Query : MySQL

Run SQL »

Result:

Click 'Run SQL' to execute the SQL statement above.

Output



Number of Records: 91

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

```
SELECT CustomerName , City , Country FROM Customers;
```

Number of Records: 91

CustomerName	City	Country
Alfreds Futterkiste	Berlin	Germany
Ana Trujillo Emparedados y helados	México D.F.	Mexico
Antonio Moreno Taquería	México D.F.	Mexico
Around the Horn	London	UK
Berglunds snabbköp	Luleå	Sweden
Blauer See Delikatessen	Mannheim	Germany
Blondel père et fils	Strasbourg	France

```
SELECT * FROM Employees;
```

Number of Records: 10

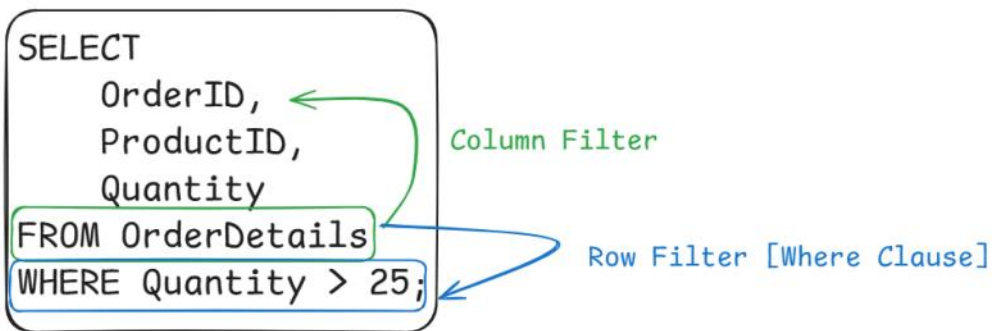
EmployeeID	LastName	FirstName	BirthDate	Photo	Notes
1	Davolio	Nancy	12/8/1968	EmpID1.pic	Education includes a BA in psychology from Colorado State University. She also completed (The Art of the Cold Call). Nancy is a member of 'Toastmasters International'.
2	Fuller	Andrew	2/19/1952	EmpID2.pic	Andrew received his BTS commercial and a Ph.D. in international marketing from the University of Dallas. He is fluent in French and Italian and reads German. He joined the company as a sales representative, was promoted to sales manager and was then named vice president of sales. Andrew is a

```
SELECT BirthDate , FirstName , LastName FROM Employees;
```

Result:

Number of Records: 10

BirthDate	FirstName	LastName
12/8/1968	Nancy	Davolio
2/19/1952	Andrew	Fuller
8/30/1963	Janet	Leverling
9/19/1958	Margaret	Peacock
3/4/1955	Steven	Buchanan
7/2/1963	Michael	Suyama
5/29/1960	Robert	King
1/9/1958	Laura	Callahan



Number of Records: 180

OrderID	ProductID	Quantity
10249	51	40
10250	51	35
10252	20	40
10252	60	40
10253	39	42
10253	49	40
10255	16	35
10255	59	30

```
SELECT
    OrderID,
    SUM(Quantity) AS TotalQuantity
FROM OrderDetails
GROUP BY OrderID;
```

Number of Records: 196

OrderID	TotalQuantity
10248	27
10249	49
10250	60
10251	41
10252	105
10253	102
10254	57
10255	110

Installation

<https://dev.mysql.com/downloads/windows/installer/>

[General Availability \(GA\) Releases](#) [Archives](#) [i](#)

MySQL Installer 8.0.43

Note: MySQL 8.0 is the final series with MySQL Installer. As of MySQL 8.1, use a MySQL product's MSI or Zip archive for installation. MySQL Server 8.1 and higher also bundle MySQL Configurator, a tool that helps configure MySQL Server.

Select Version:
8.0.43

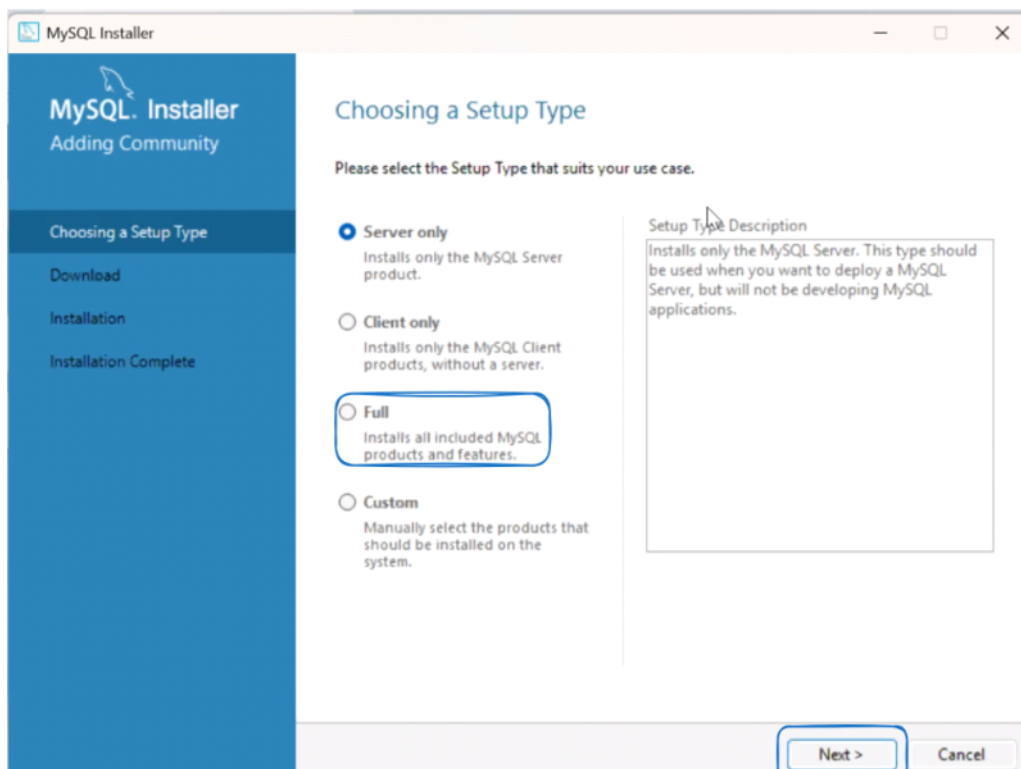
Select Operating System:
Microsoft Windows

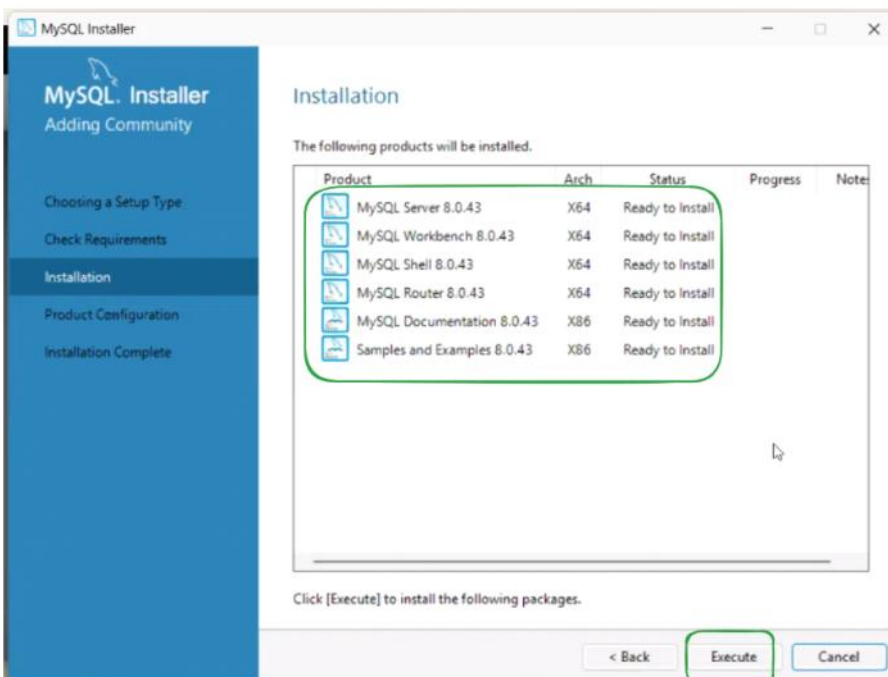
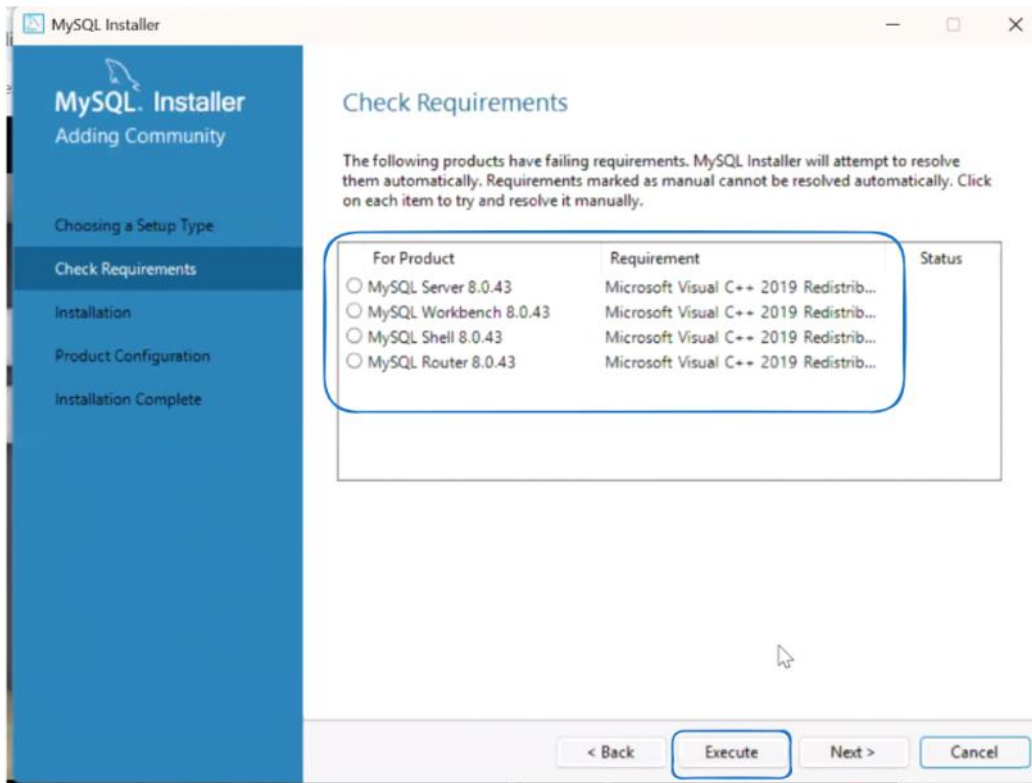
Windows (x86, 32-bit), MSI Installer <small>(mysql-installer-web-community-8.0.43.0.msi)</small>	8.0.43	2.1M	Download
Windows (x86, 32-bit), MSI Installer <small>(mysql-installer-community-8.0.43.0.msi)</small>	8.0.43	354.3M	Download

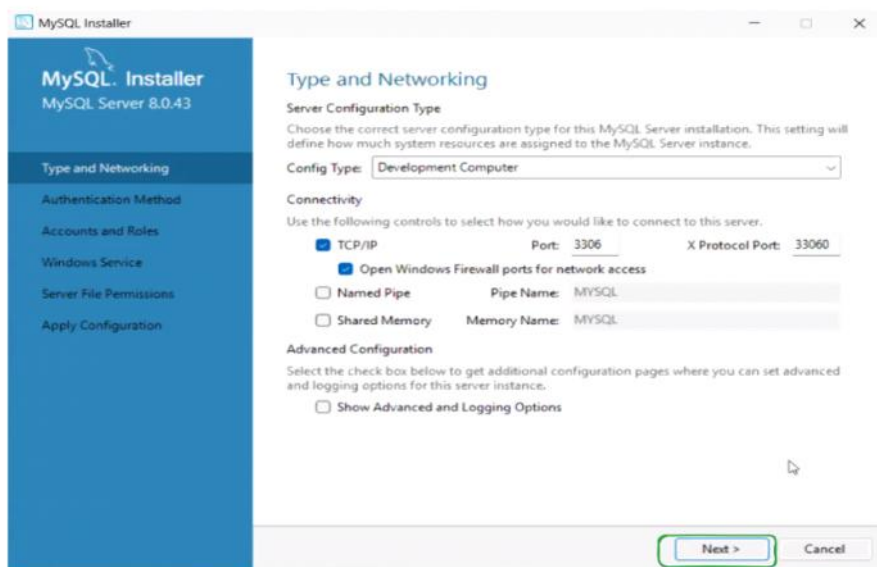
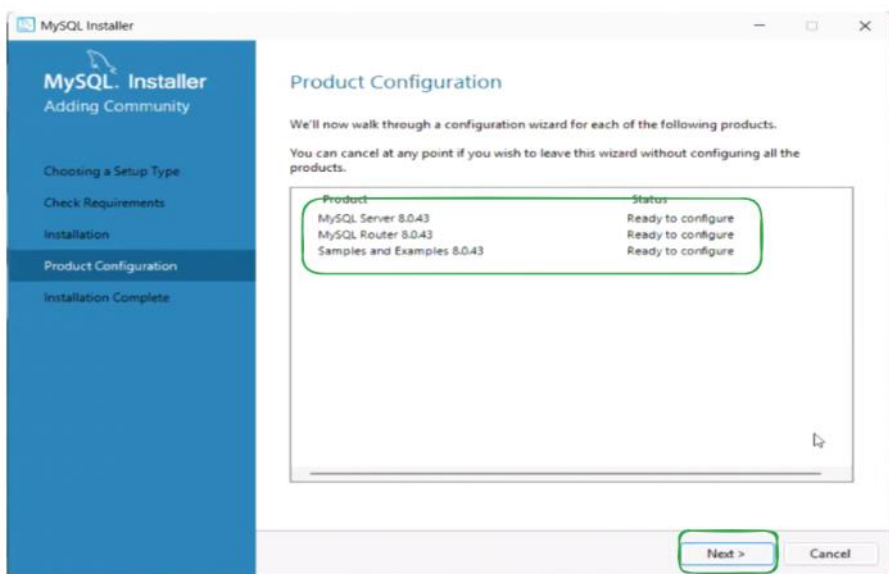
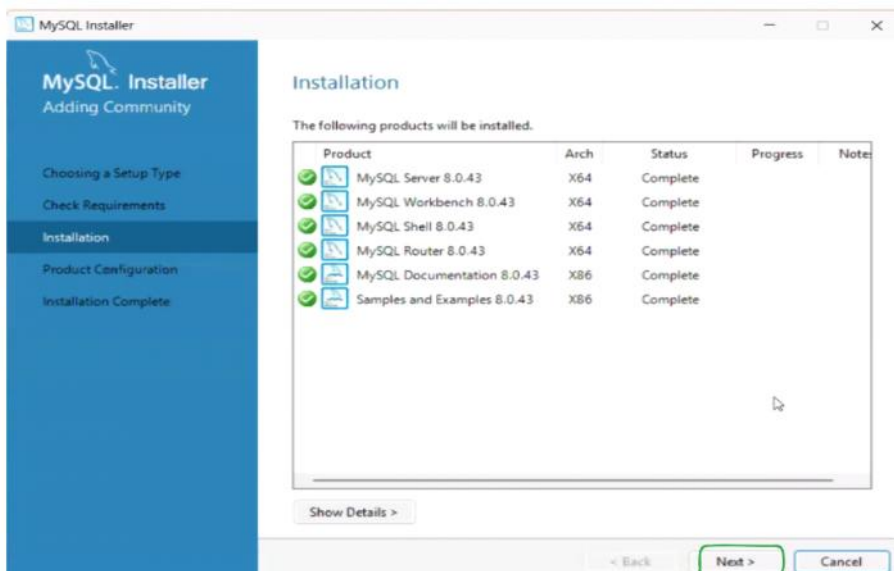
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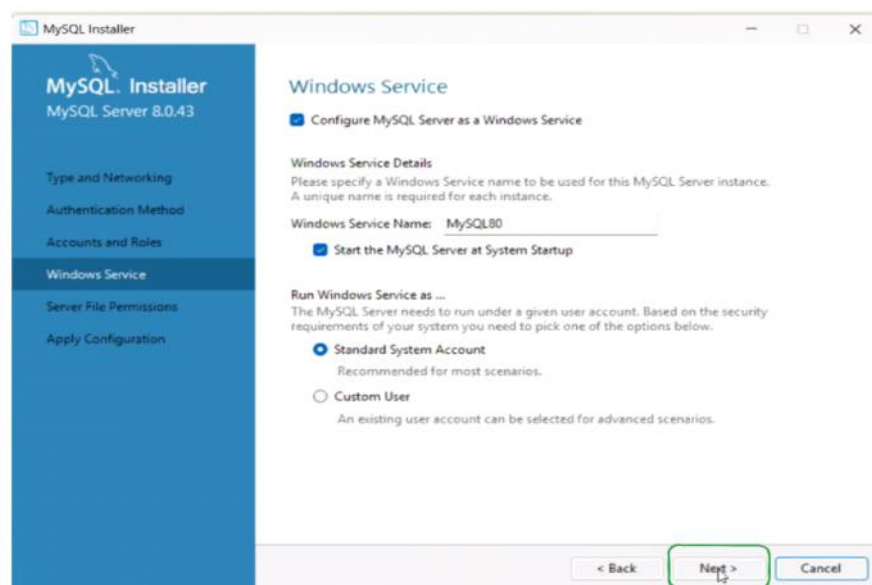
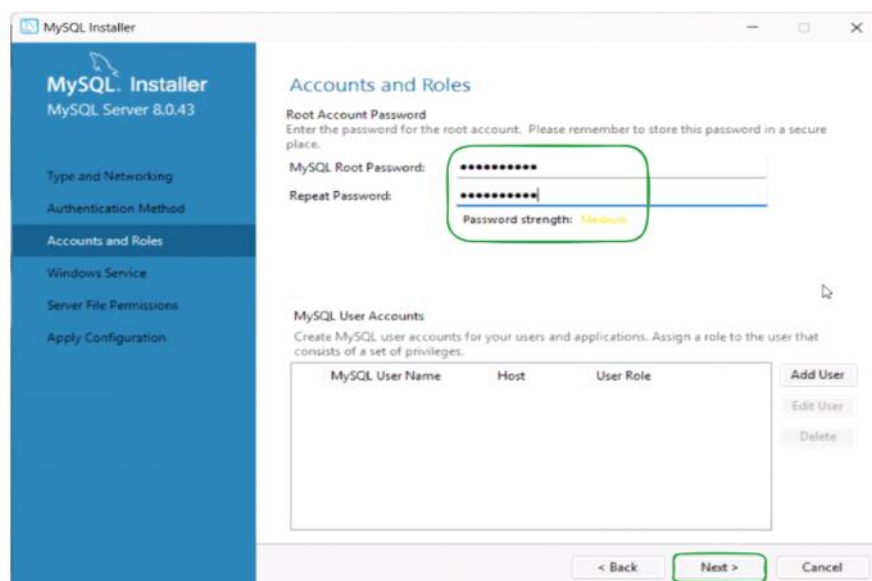
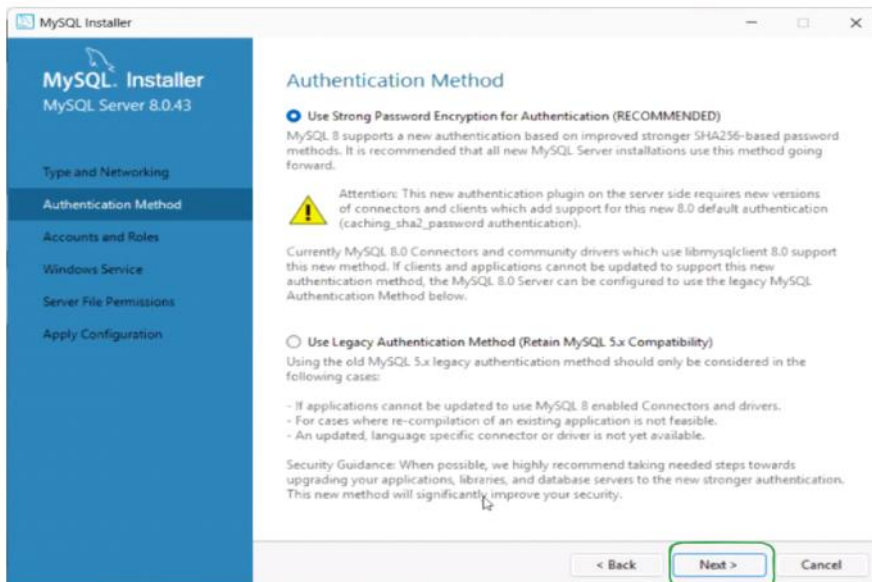
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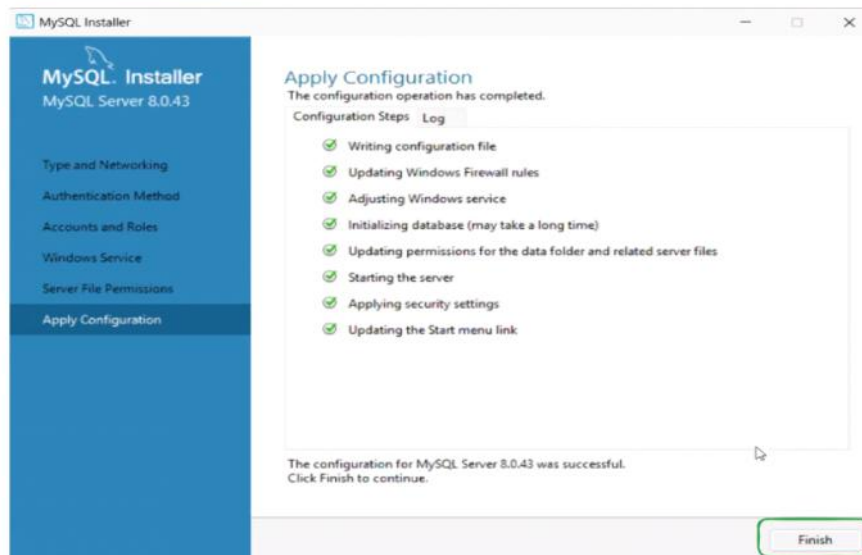
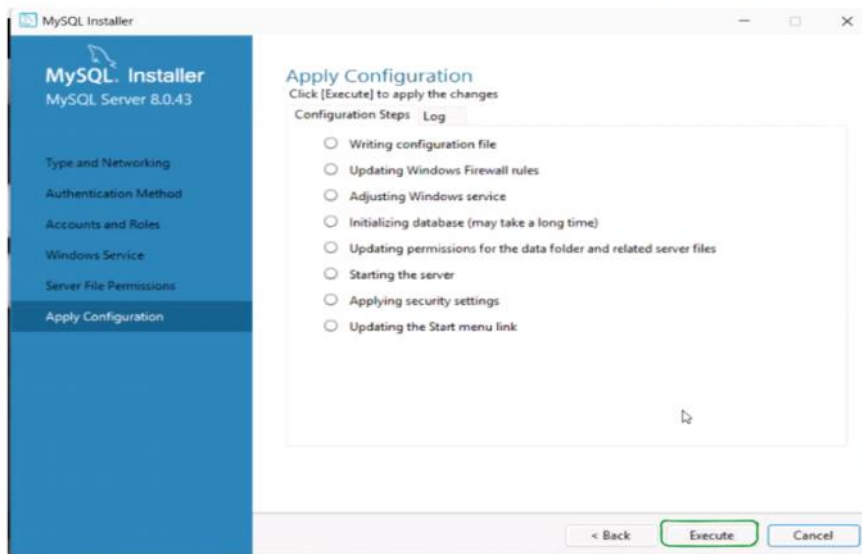
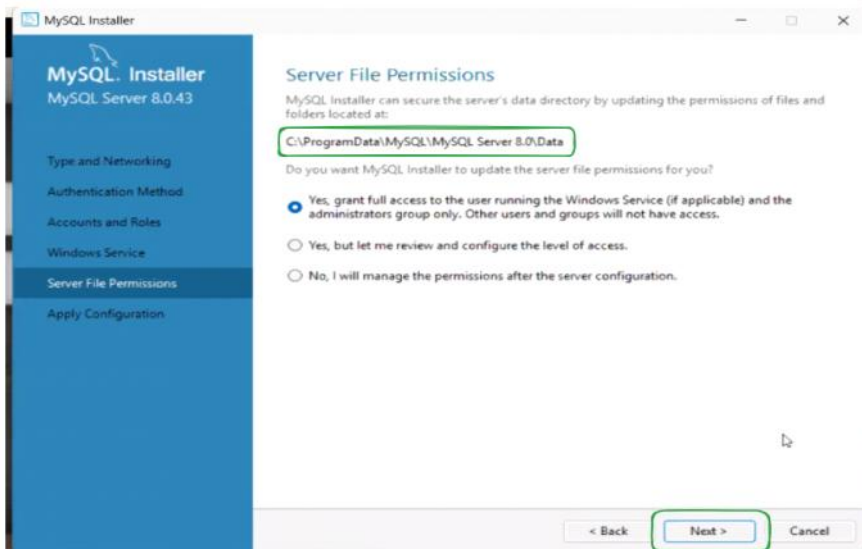
No thanks, just start my download.

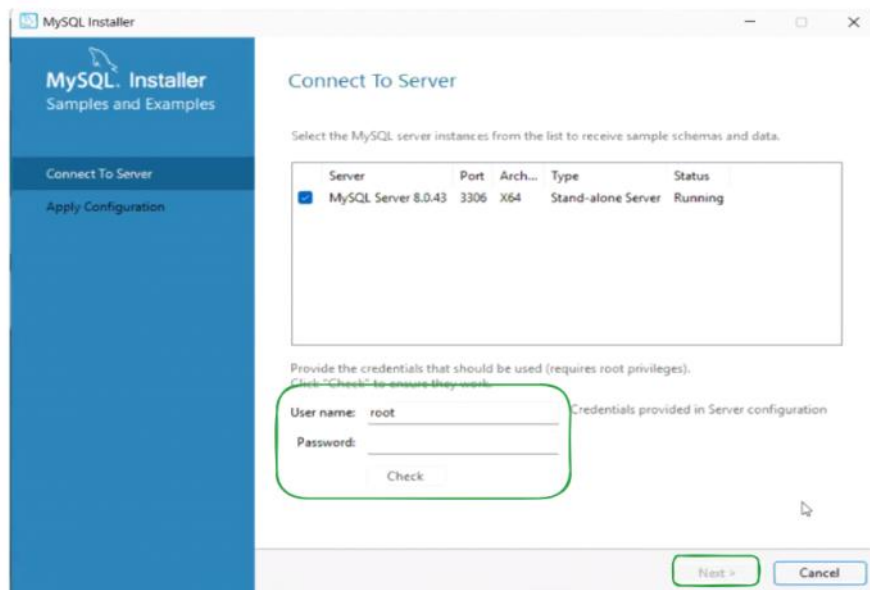
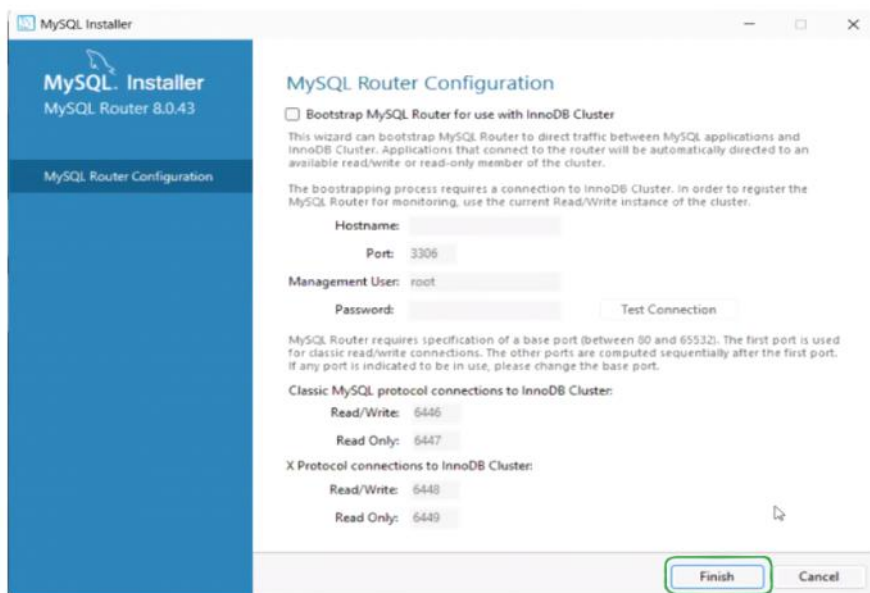
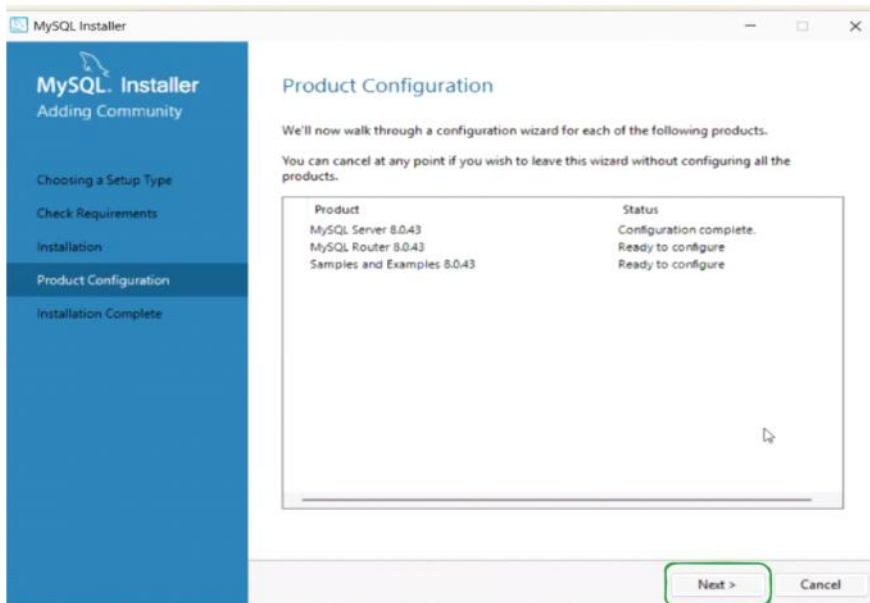


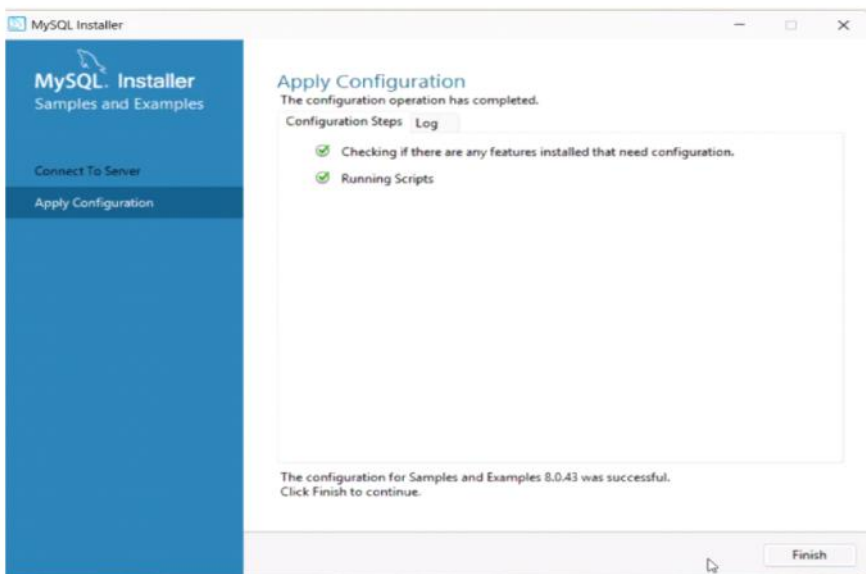
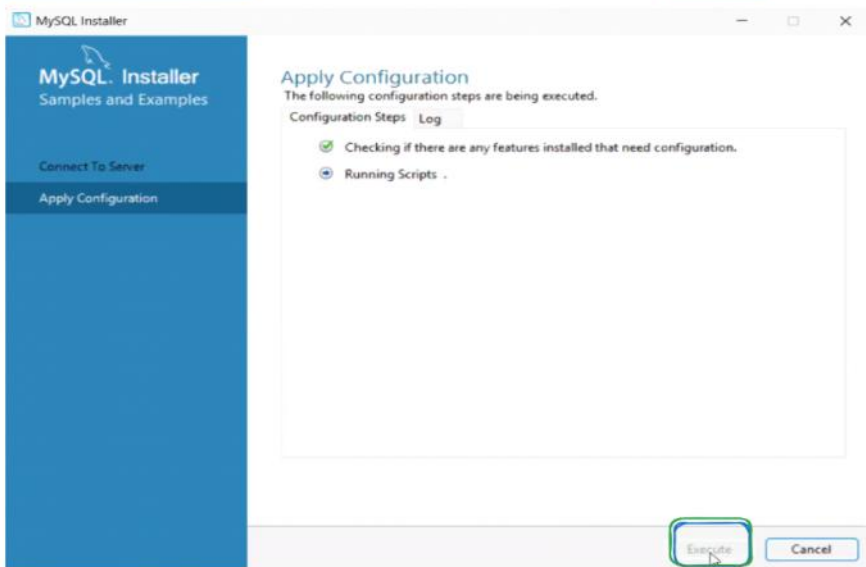
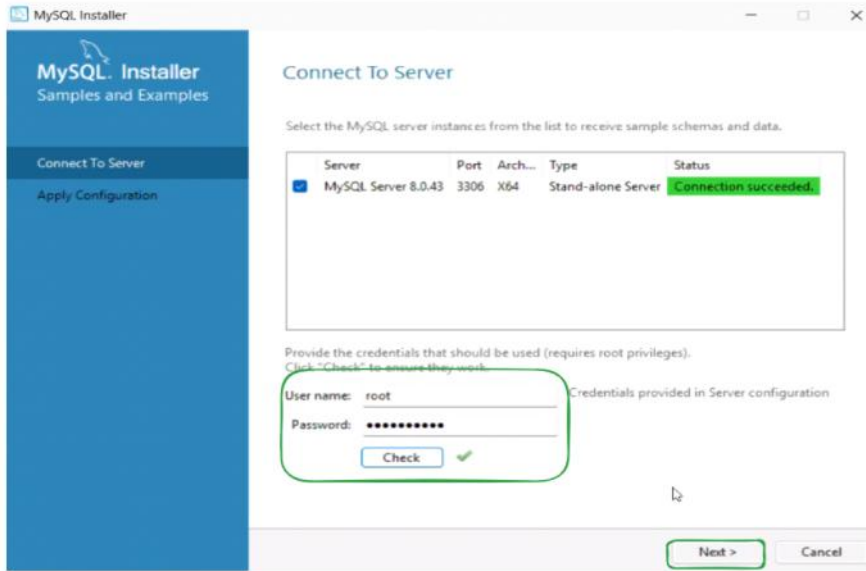


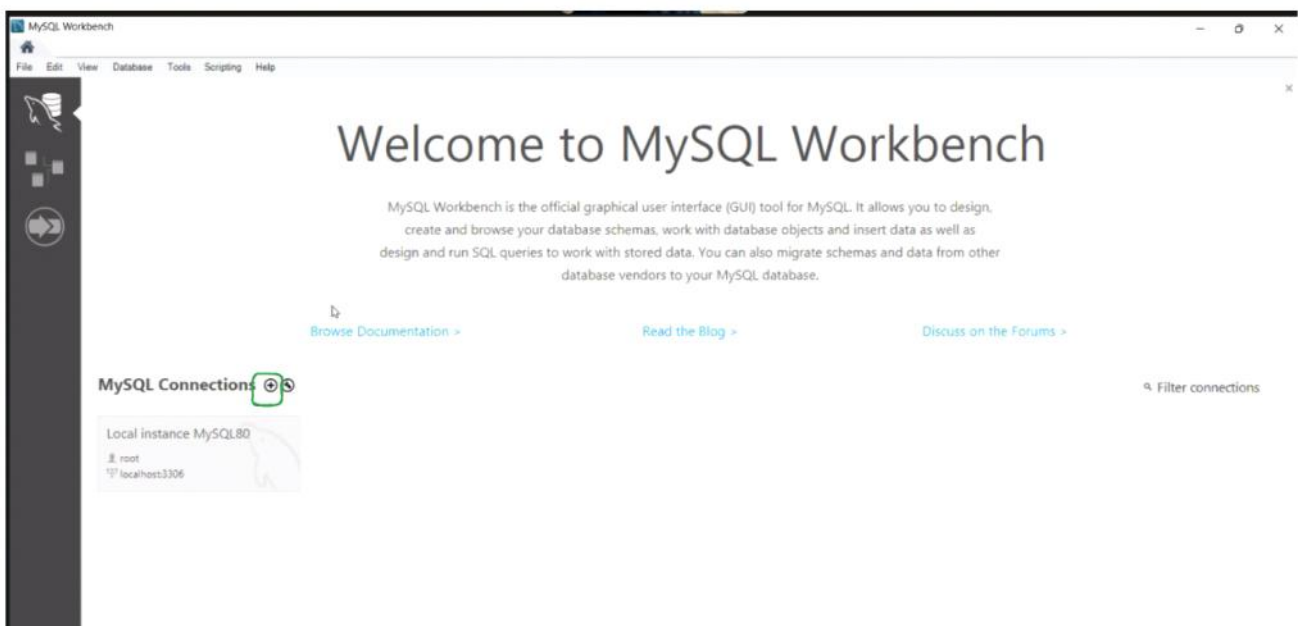
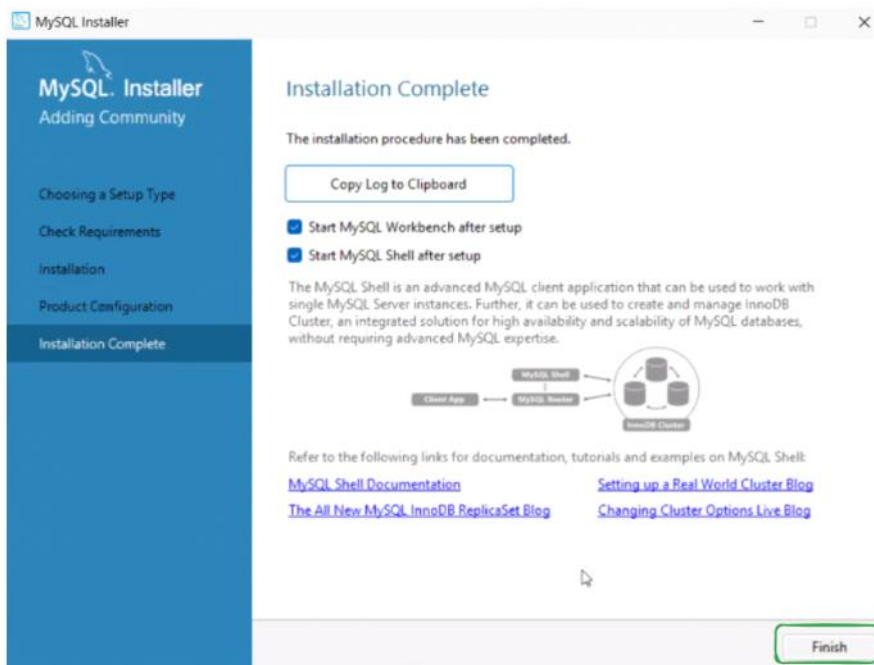
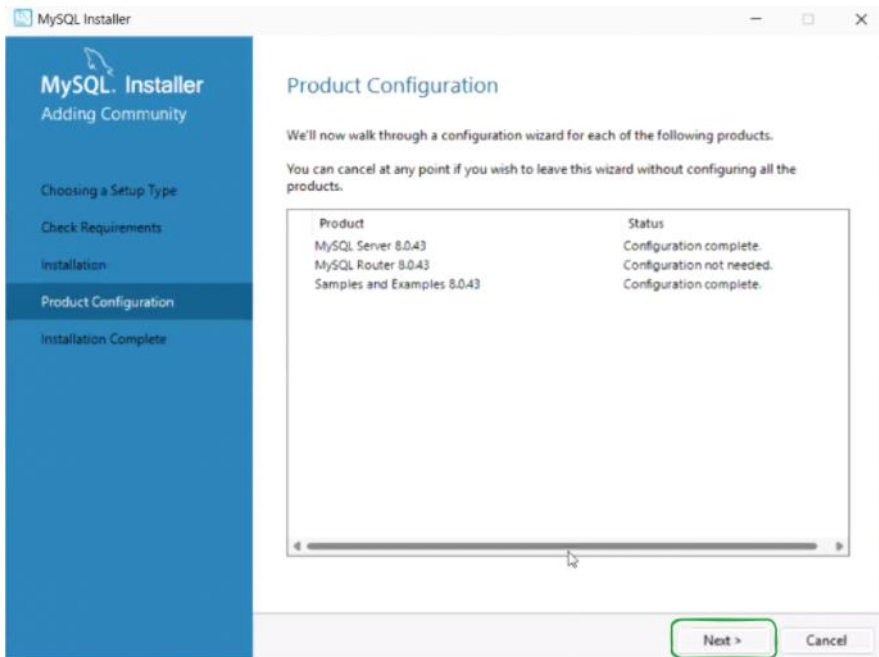












Setup New Connection

Connection Name: Bike_sale Type a name for the connection

Connection Method: Standard (TCP/IP) Method to use to connect to the RDBMS

Parameters SSL Advanced

Hostname: 127.0.0.1 Port: 3306 Name or IP address of the server host - and TCP/IP port.

Username: root Name of the user to connect with.

Password: Store in Vault ... Clear The user's password. Will be requested later if it's not set.

Default Schema: The schema to use as default schema. Leave blank to select it later.

Configure Server Management... Test Connection Cancel OK

Connect to MySQL Server

Please enter password for the following service:

Service: Mysql@127.0.0.1:3306

User: root

Password:

☐ Save password in vault

OK Cancel

MySQL Workbench

Successfully made the MySQL connection

Information related to this connection:

Host: 127.0.0.1

Port: 3306

User: root

SSL: enabled with TLS_AES_128_GCM_SHA256

A successful MySQL connection was made with the parameters defined for this connection.

OK

MySQL Workbench

Bike_sale x

File Edit View Query Database Server Tools Scripting Help

Navigator

MANAGEMENT

- Server Status
- Client Connections
- Users and Privileges
- Status and System Variables
- Data Export
- Data Import/Restore

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

SQL Editor

SQL: Additions

Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.

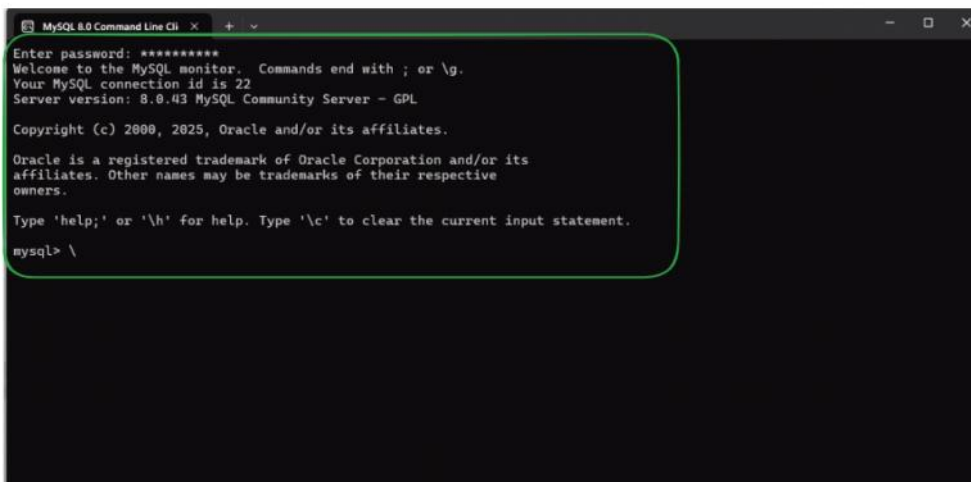
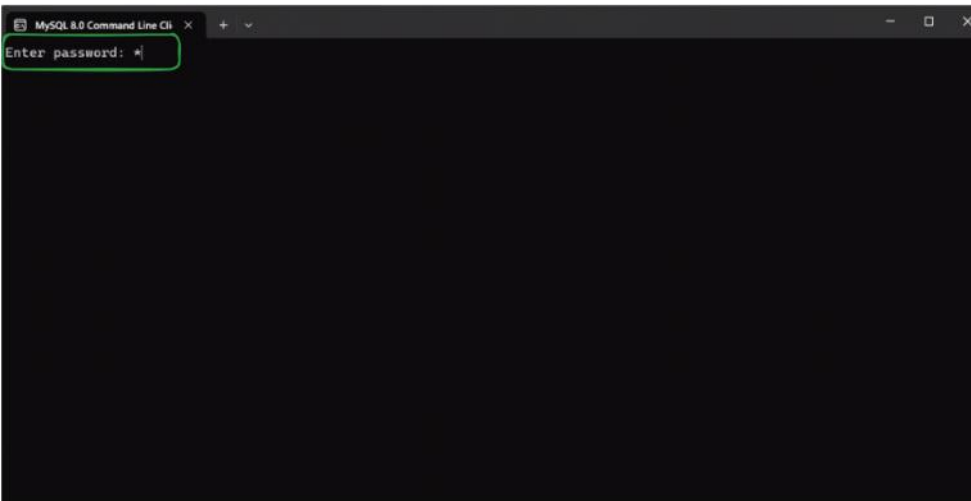
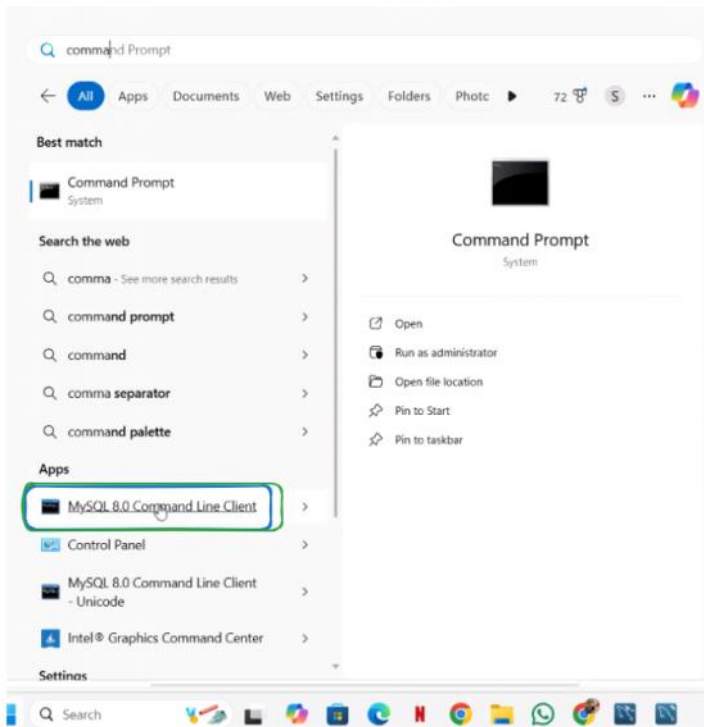
Context Help Snippets

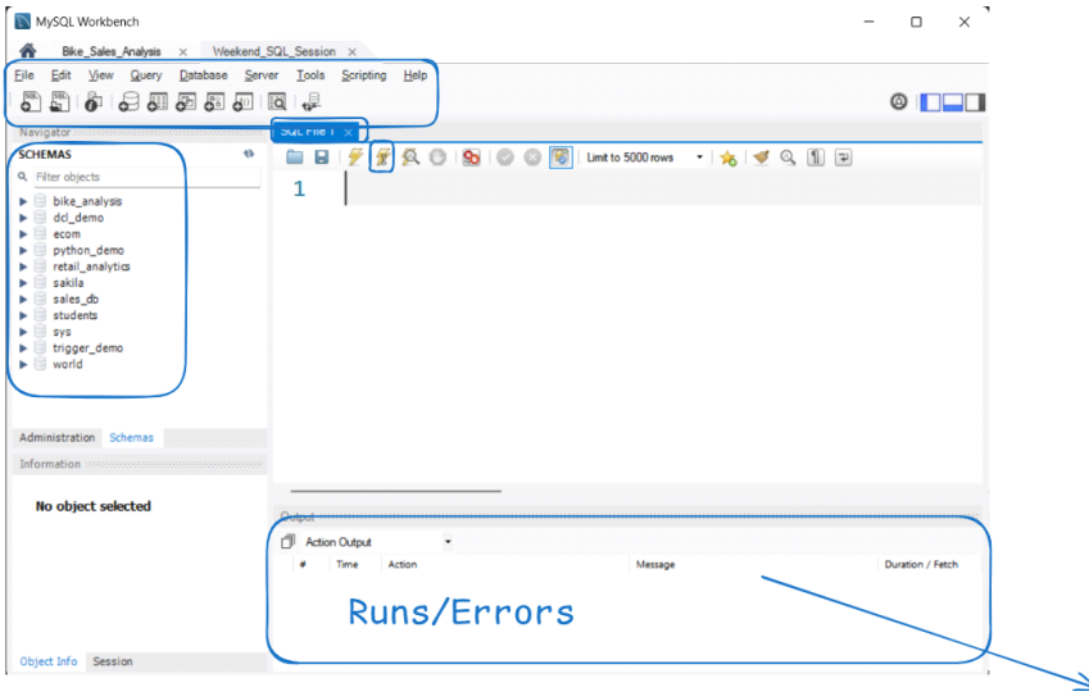
Information

No object selected

Action Output

Time Action Message Duration / Fetch





```
mysql> SHOW DATABASES;
+-----+
| Database |
+-----+
| bike_analysis |
| dcl_demo      |
| ecom          |
| information_schema |
| mysql         |
| performance_schema |
| python_demo   |
| retail_analytics |
| sakila        |
| sales_db      |
| students      |
| sys           |
| trigger_demo  |
| world         |
+-----+
14 rows in set (0.02 sec)
```

USE <Db_name>;

SELECT DATABASE();

Which database you
have currently selected

```
mysql> SELECT DATABASE();
+-----+
| DATABASE() |
+-----+
| NULL       |
+-----+
1 row in set (0.06 sec)
```

No Database Selected Yet.

```
mysql> USE bike_analysis;
Database changed
mysql> SELECT DATABASE();
+-----+
| DATABASE() |
+-----+
| bike_analysis |
+-----+
1 row in set (0.00 sec)
```

Current Database Selected

bike_analysis

bike_analysis

- Tables
 - bank_transactions
 - calendar
 - customer
 - customer_unique
 - customers
 - employee_detail
 - events
 - orders
 - product-categories
 - product-subcategories
 - products
 - returns
 - sales-2015
 - sales-2016
 - sales-2017
 - student_info
 - students
 - territories

GUI - Graphical User Interface

```
mysql> SHOW TABLES;
+-----+
| Tables_in_bike_analysis |
+-----+
| bank_transactions |
| calendar |
| children |
| customer |
| customer_unique |
| customers |
| employee_detail |
| events |
| orders |
| product-categories |
| product-subcategories |
| products |
| returns |
| sales-2015 |
| sales-2016 |
| sales-2017 |
| salestrend |
| student_info |
| students |
| territories |
+-----+
20 rows in set (0.16 sec)
```

I want to read the data

SELECT * FROM territories;

Navigator

SCHEMAS

Filter objects

bike_analysis

- Tables
 - bank_transactions
 - calendar
 - customer
 - customer_unique
 - customers
 - employee_detail
 - events
 - orders
 - product-categories
 - product-subcategories
 - products
 - returns
 - sales-2015
 - sales-2016
 - sales-2017
 - student_info
 - students
 - territories

Administration Schemas

Information

No object selected

SQL File 1*

1 # You have to select the database.
2 • USE bike_analysis;
3 • SHOW TABLES;

Result Grid

Filter Rows

Exports

Wrap Cell Content

Tables_in_bike_analysis

- bank_transactions
- calendar
- children
- customer
- customer_unique
- customers
- employee_detail
- events
- orders
- product-categories
- product-subcategories
- products
- returns
- sales-2015

Result 1

Output

Action Output

#	Time	Action
1	14:11:14	USE bike_analysis
2	14:11:26	SHOW TABLES

4 • SELECT * FROM Customers;

CustomerKey	Prefix	FirstName	LastName	FullName	DateOfBirth	Country	MaritalStatus	Gender	EmailAddress	AnnualIncome	IncomeCategory	TotalChildren	EducationLevel	Occupation
11000	MR.	JON	YANG	JON YANG	1966-08-04	USA	M	M	jon24@learnsector.com	90000	Moderate Income	2	Bachelors	Professor
11001	MR.	EUGENE	HUANG	EUGENE HUANG	1965-05-14	USA	S	M	eugene10@learnsector.com	60000	Moderate Income	3	Bachelors	Professor
11002	MR.	RUBEN	TORRES	RUBEN TORRES	1965-12-08	USA	M	M	ruben35@learnsector.com	60000	Moderate Income	3	Bachelors	Professor
11003	MS.	CHRISTY	ZHU	CHRISTY ZHU	1968-02-15	USA	S	F	christy12@learnsector.com	NULL	Not Available	0	Bachelors	Professor
11004	MRS.	ELIZABETH	JOHNSON	ELIZABETH JOHNSON	1968-08-08	USA	S	F	elizabeth5@learnsector.com	80000	Moderate Income	5	Bachelors	Professor
11005	MR.	JULIO	RUIZ	JULIO RUIZ	1965-05-08	USA	S	M	julio1@learnsector.com	70000	Moderate Income	0	Bachelors	Professor
11007	MR.	MARCO	MEHTA	MARCO MEHTA	1964-09-05	USA	M	M	marco14@learnsector.com	60000	Moderate Income	3	Bachelors	Professor
11008	MRS.	ROBIN	VERHOFF	ROBIN VERHOFF	1964-07-07	USA	S	F	rob4@learnsector.com	60000	Moderate Income	4	Bachelors	Professor
11009	MR.	SHANNON	CARLSON	SHANNON CARLSON	1964-01-04	USA	S	M	shannon38@learnsector.com	70000	Moderate Income	0	Bachelors	Professor
11010	MS.	JACQUELYN	SUAREZ	JACQUELYN SUAREZ	1964-06-02	USA	S	F	jacquelyn20@learnsector.com	70000	Moderate Income	0	Bachelors	Professor
11011	MR.	CURTIS	LU	CURTIS LU	1963-04-11	USA	M	M	curtis9@learnsector.com	60000	Moderate Income	4	Bachelors	Professor
11012	MRS.	LAUREN	WALKER	LAUREN WALKER	1968-01-18	USA	M	F	lauren41@learnsector.com	100000	Moderate Income	2	Bachelors	Management
11013	MR.	TANI	SRINIVAS	TANI SRINIVAS	1969-06-18	USA	M	M	tani27@learnsector.com	100000	Moderate Income	3	Bachelors	Management

Customers 2 x

Read Only

```

6 • SELECT
7     FirstName,
8     LastName,
9     EmailAddress,
10    AnnualIncome
11 FROM Customers
12 LIMIT 10;
```

FirstName	LastName	EmailAddress	AnnualIncome
JON	YANG	jon24@learnsector.com	90000
EUGENE	HUANG	eugene10@learnsector.com	60000
RUBEN	TORRES	ruben35@learnsector.com	60000
CHRISTY	ZHU	christy12@learnsector.com	NULL
ELIZABETH	JOHNSON	elizabeth5@learnsector.com	80000
JULIO	RUIZ	julio1@learnsector.com	70000
MARCO	MEHTA	marco14@learnsector.com	60000
ROBIN	VERHOFF	rob4@learnsector.com	60000
SHANNON	CARLSON	shannon38@learnsector.com	70000
JACQUELYN	SUAREZ	jacquelyn20@learnsector.com	70000

```

SELECT
-> FirstName,
-> LastName,
-> EmailAddress,
-> AnnualIncome
-> FROM Customers
-> LIMIT 10;
```

FirstName	LastName	EmailAddress	AnnualIncome
JON	YANG	jon24@learnsector.com	90000
EUGENE	HUANG	eugene10@learnsector.com	60000
RUBEN	TORRES	ruben35@learnsector.com	60000
CHRISTY	ZHU	christy12@learnsector.com	NULL
ELIZABETH	JOHNSON	elizabeth5@learnsector.com	80000
JULIO	RUIZ	julio1@learnsector.com	70000
MARCO	MEHTA	marco14@learnsector.com	60000
ROBIN	VERHOFF	rob4@learnsector.com	60000
SHANNON	CARLSON	shannon38@learnsector.com	70000
JACQUELYN	SUAREZ	jacquelyn20@learnsector.com	70000

10 rows in set (0.00 sec)

```
mysql> SELECT * FROM  
-> territories;
```

SalesTerritoryKey	Region	Country	Continent
1	Northwest	United States	North America
2	Northeast	United States	North America
3	Central	United States	North America
4	Southwest	United States	North America
5	Southeast	United States	North America
6	Canada	Canada	North America
7	France	France	Europe
8	Germany	Germany	Europe
9	Australia	Australia	Pacific
10	United Kingdom	United Kingdom	Europe

```
10 rows in set (0.06 sec)
```