

# Deployment Plan - Online Appointment Management System

## 1. Introduction

### 1.1 Purpose

This document outlines the deployment strategy for the Bus Rental and Revenue Management System, ensuring a smooth transition from development to production while maintaining reliability, security, and scalability.

### 1.2 Scope

The deployment plan covers the release process, environments, CI/CD pipelines, rollback strategy, monitoring, and security measures for the Bus Rental and Revenue Management System.

### 1.3 Target Audience

- Developers
- Software developers
- System architects
- Database administrator
- Test engineers

## 2. Deployment Architecture

### 2.1 Infrastructure Overview

- **Cloud Provider:** AWS / Google Cloud / Azure
- **Compute Services:** EC2 / Kubernetes / Docker Containers
- **Database:** MySQL
- **Storage:** S3 for static assets, EFS for persistent data
- **Caching:** Redis / Memcached
- **Load Balancing:** Elastic Load Balancer (ELB) / Nginx / Cloudflare
- **Monitoring & Logging:** Prometheus, Grafana, ELK Stack (Elasticsearch, Logstash, Kibana)

### 2.2 Deployment Environments

Environment	Purpose	Hosting Platform
Development	Ongoing development/testing	Local / Cloud Dev Instance
Staging	Pre-production testing	Cloud Staging Instance
Production	Live system for end users	Cloud Production Instance

## 3. Deployment Process

### 3.1 Continuous Integration & Deployment (CI/CD)

**Tools Used:** GitHub Actions / Jenkins / GitLab CI

**Steps:**

1. Code is pushed to repository (GitHub / GitLab / Bitbucket).

2. Automated tests are executed.
3. Code is built into Docker images.
4. Artifacts are stored in container registry.
5. Deployment to staging environment for final verification.
6. Manual or automated approval for production release.
7. Deployment to production using blue-green or rolling update strategy.

### 3.2 Deployment Strategies

Strategy	Description
Blue-Green	Two identical environments; traffic is switched to the new version after verification.
Rolling Update	Gradually deploys new versions, ensuring zero downtime.
Canary Release	Deploys to a small percentage of users first before full rollout.

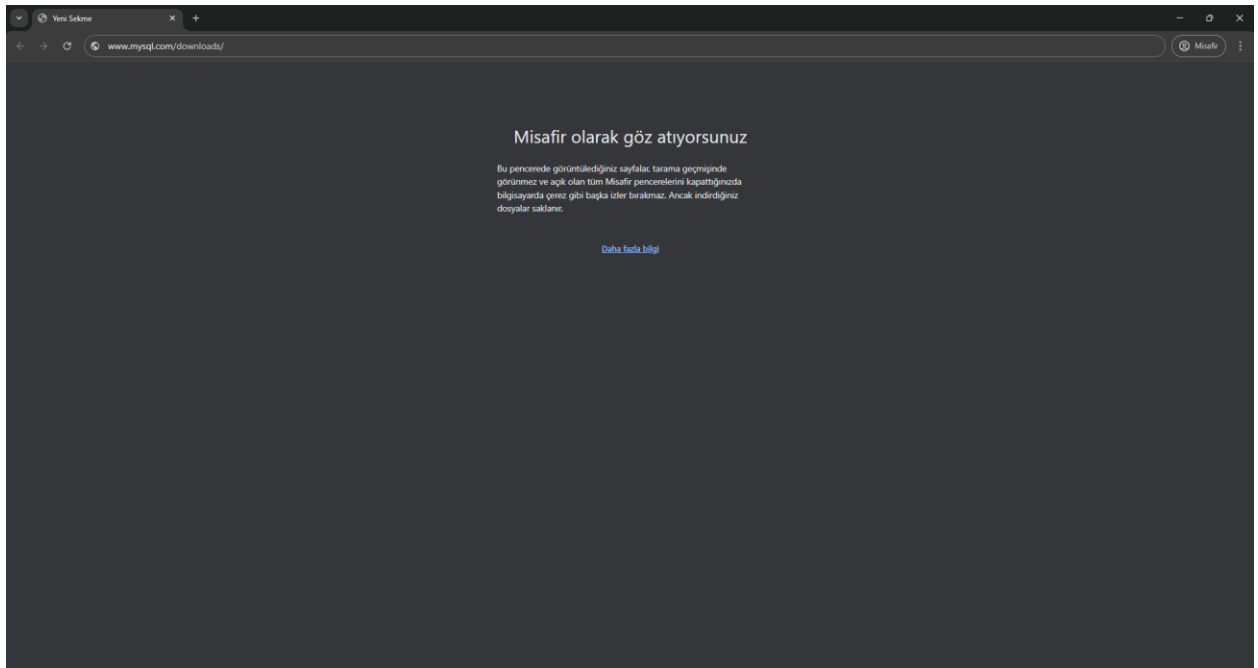
### 3.3 Rollback Strategy

- **Database Backups:** Automatic backups before deployment.
- **Feature Flags:** Toggle features off if a failure occurs.
- **Versioned Deployments:** Ability to revert to the last stable version.
- **Monitoring Alerts:** Immediate alerts in case of failure.

## SETUP

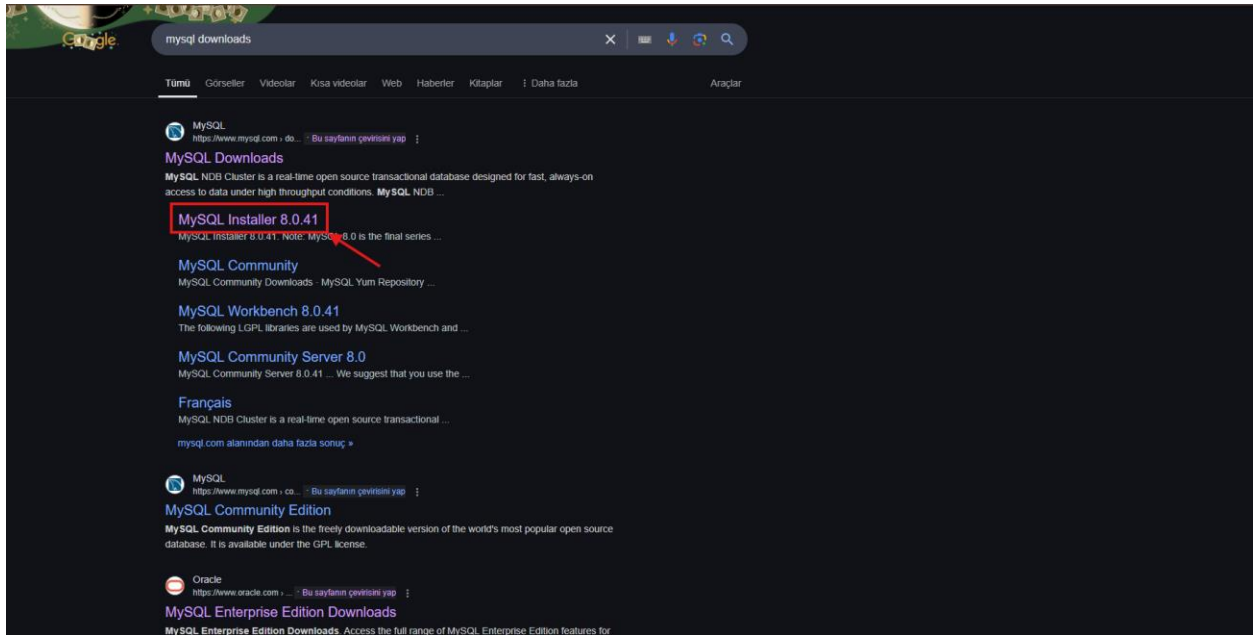
### Step - 1

Search by typing '[www.mysql.com/downloads/](https://www.mysql.com/downloads/)' in the search bar.



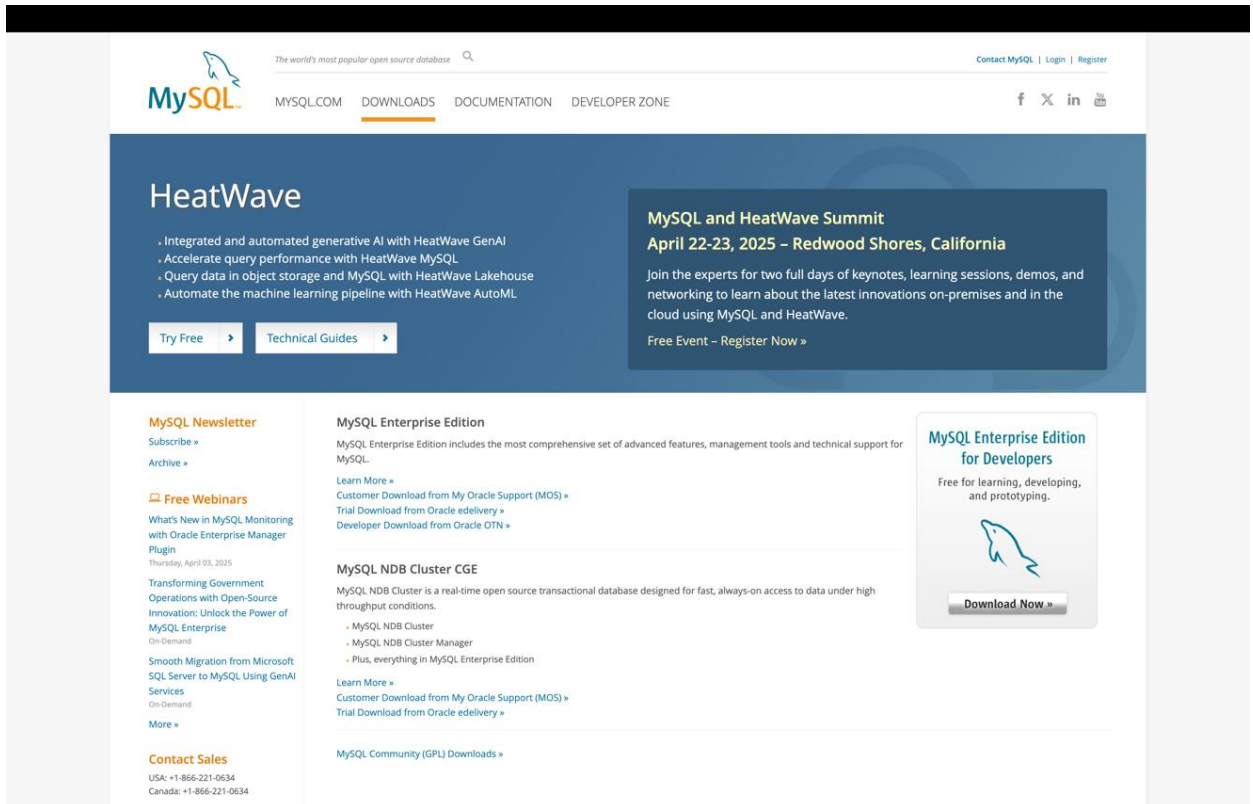
## Step – 2

On the page, click on “MySQL Installer 8.0.41”.



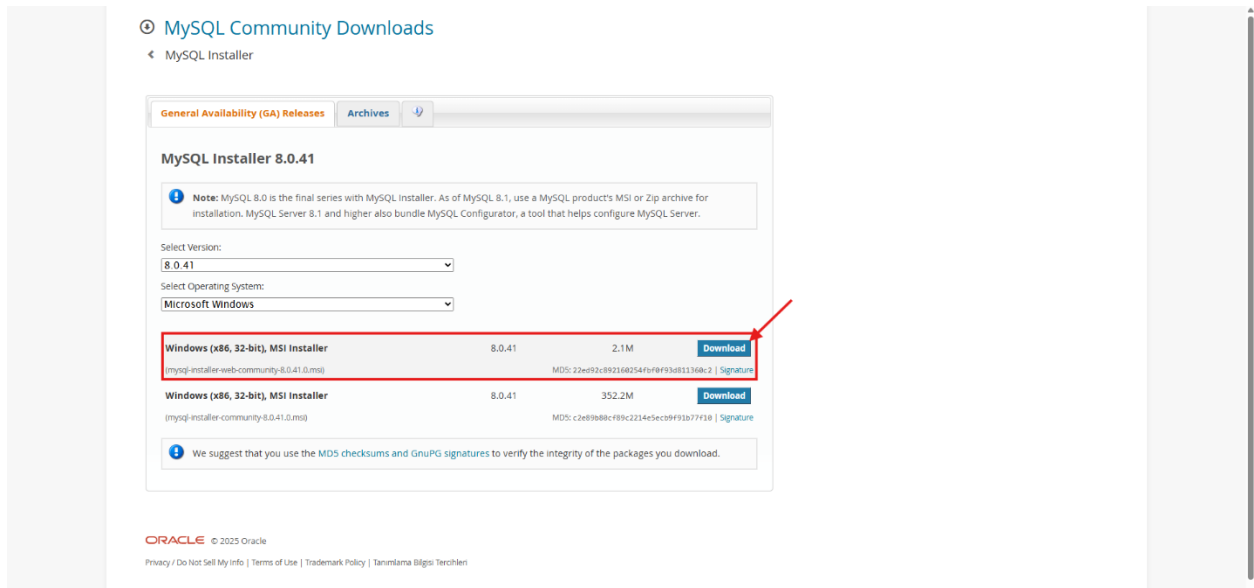
## Step – 3

On the page, click on “MySQL Community (GPL) Downloads.”.



## Step – 4

On the page, click on the “Windows(x86, 32-bit), MSI Installer Download.”.



MySQL Community Downloads

MySQL Installer

General Availability (GA) Releases Archives

MySQL Installer 8.0.41

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: 8.0.41

Select Operating System: Microsoft Windows

Windows (x86, 32-bit), MSI Installer	8.0.41	2.1M	Download
<small>(mysql-installer-web-community-8.0.41.0.msi) MD5: 22x492c892168254f5b9f93b81336a22   Signature</small>			
Windows (x86, 32-bit), MSI Installer	8.0.41	352.2M	Download
<small>(mysql-installer-community-8.0.41.0.msi) MD5: c2x8988c495c2214e5ec9f93b77f18   Signature</small>			

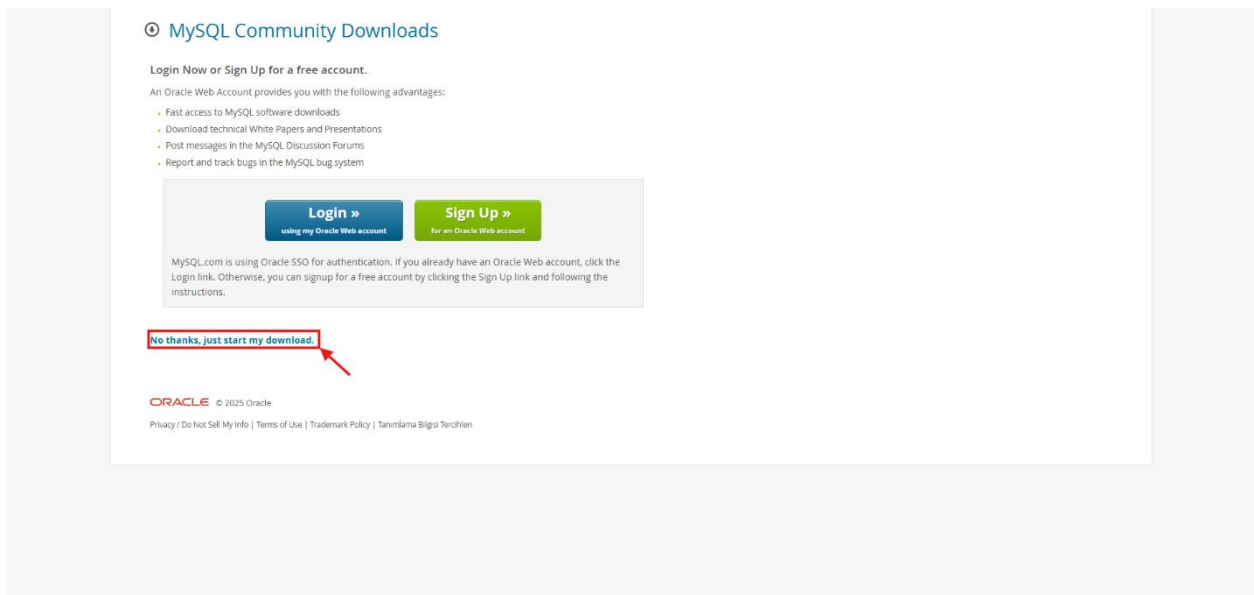
We suggest that you use the MD5 checksums and GnuPG signatures to verify the integrity of the packages you download.

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## Step – 5

On the page, click on “No thanks, just start my download.”.



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 »  
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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 sign up for a free account by clicking the Sign Up link and following the instructions.

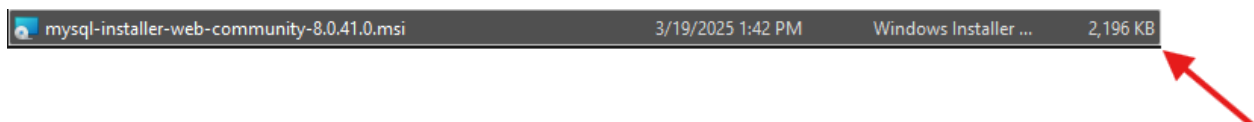
No thanks, just start my download.

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## Step – 6

In downloads, we open the incoming file by double-clicking on the icon.



mysql-installer-web-community-8.0.41.0.msi

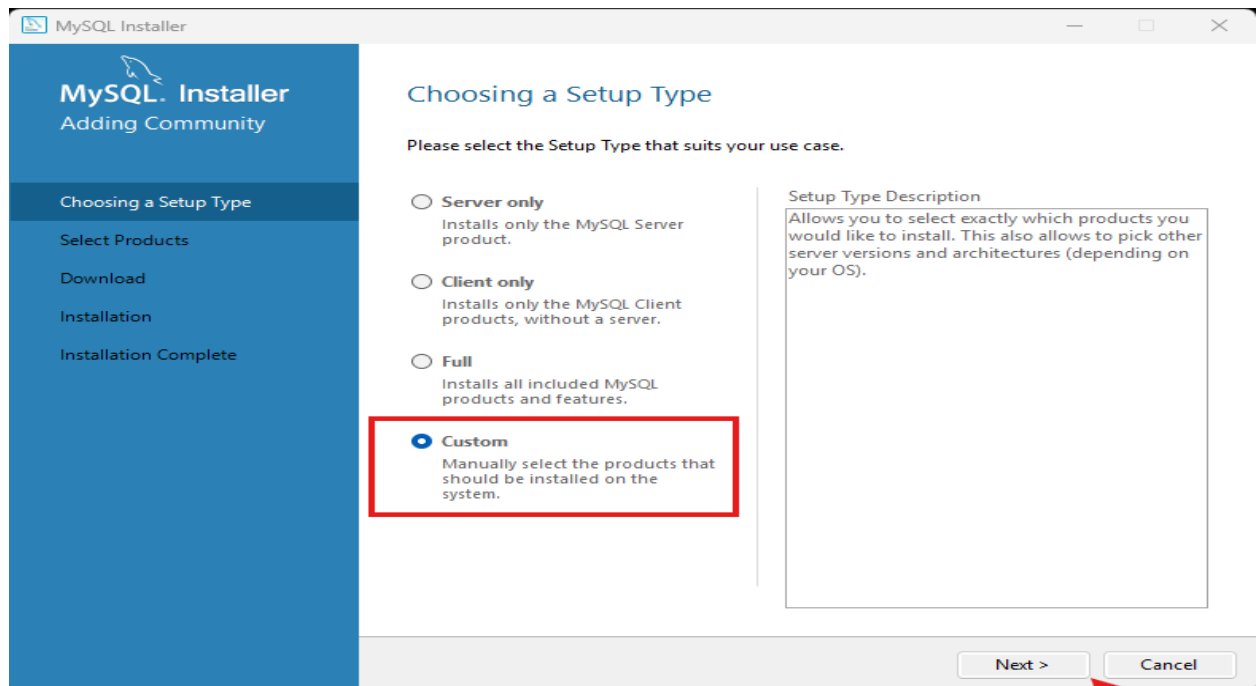
3/19/2025 1:42 PM

Windows Installer ...

2,196 KB

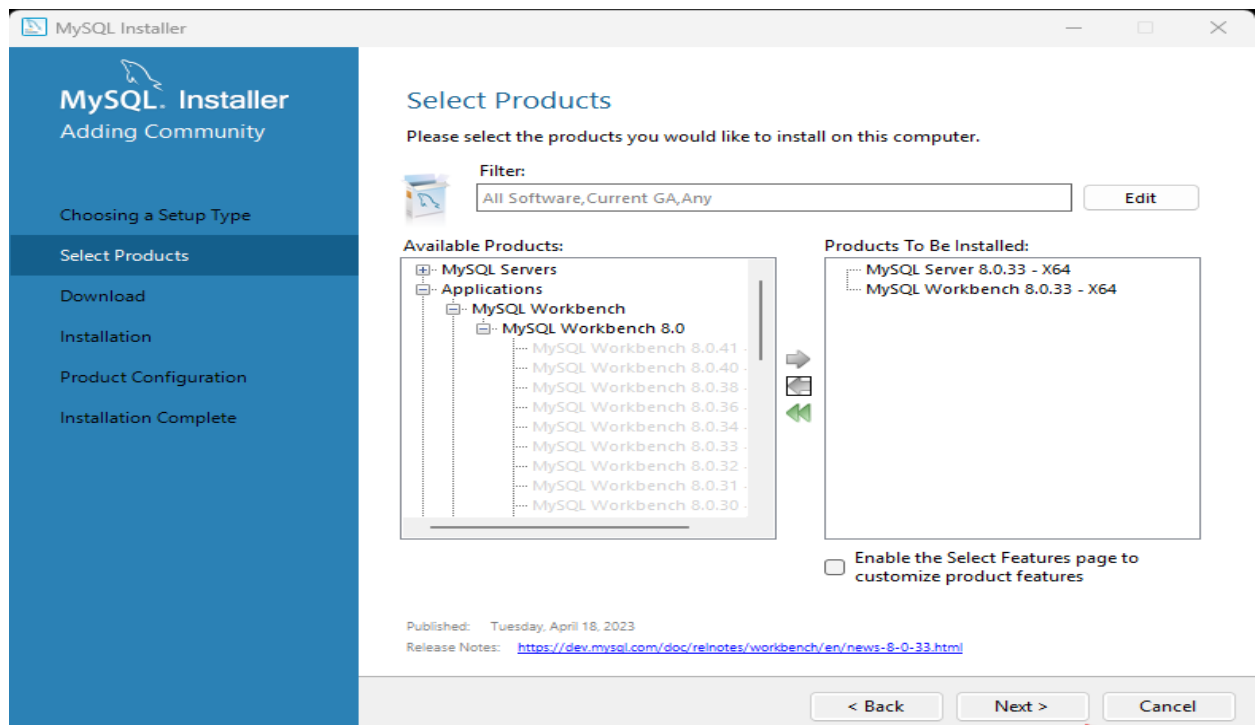
## Step – 7

We will choose “Custom” part on the setup type and press Next button.



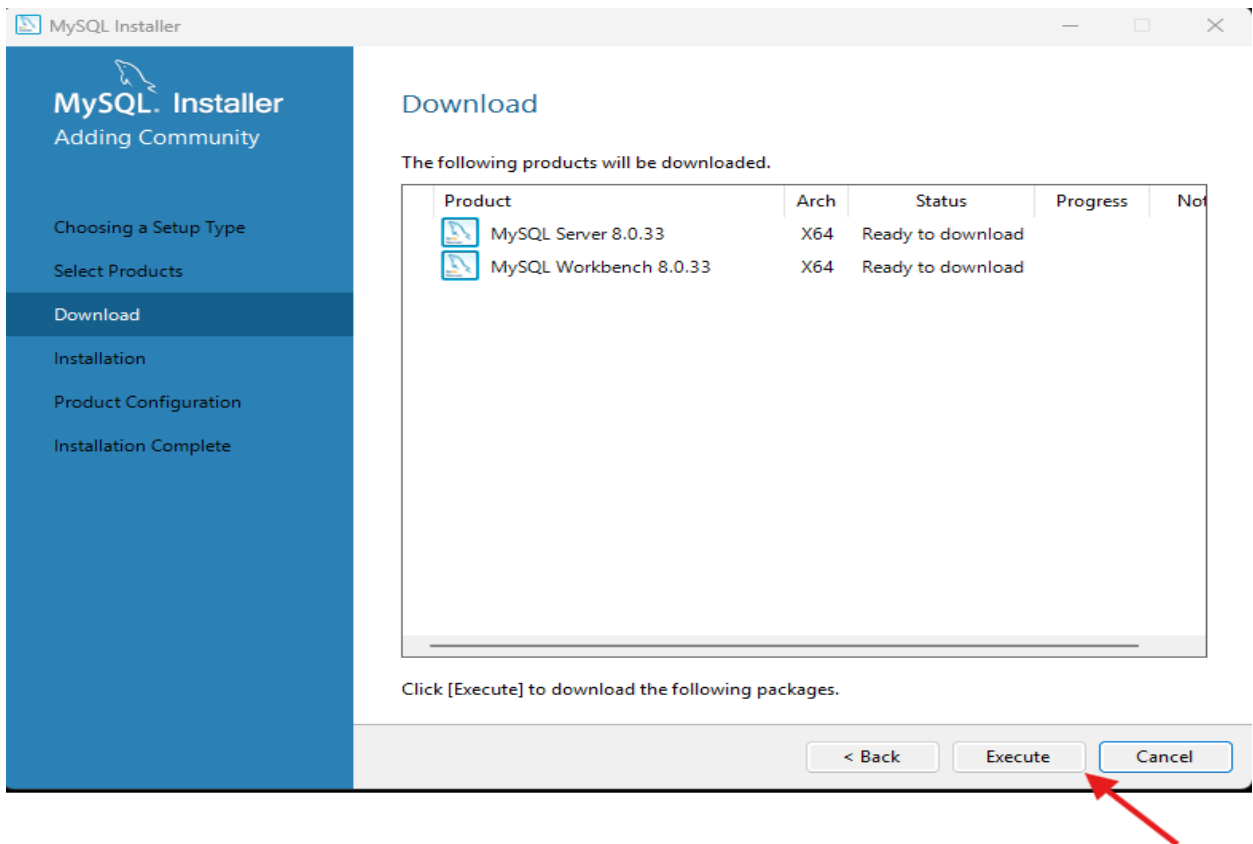
## Step - 8

We have to choose application “MySQL Server 8.0.33 – X64 and MySQL Workbench .0.33 – X64 Packages.” and press Next button.



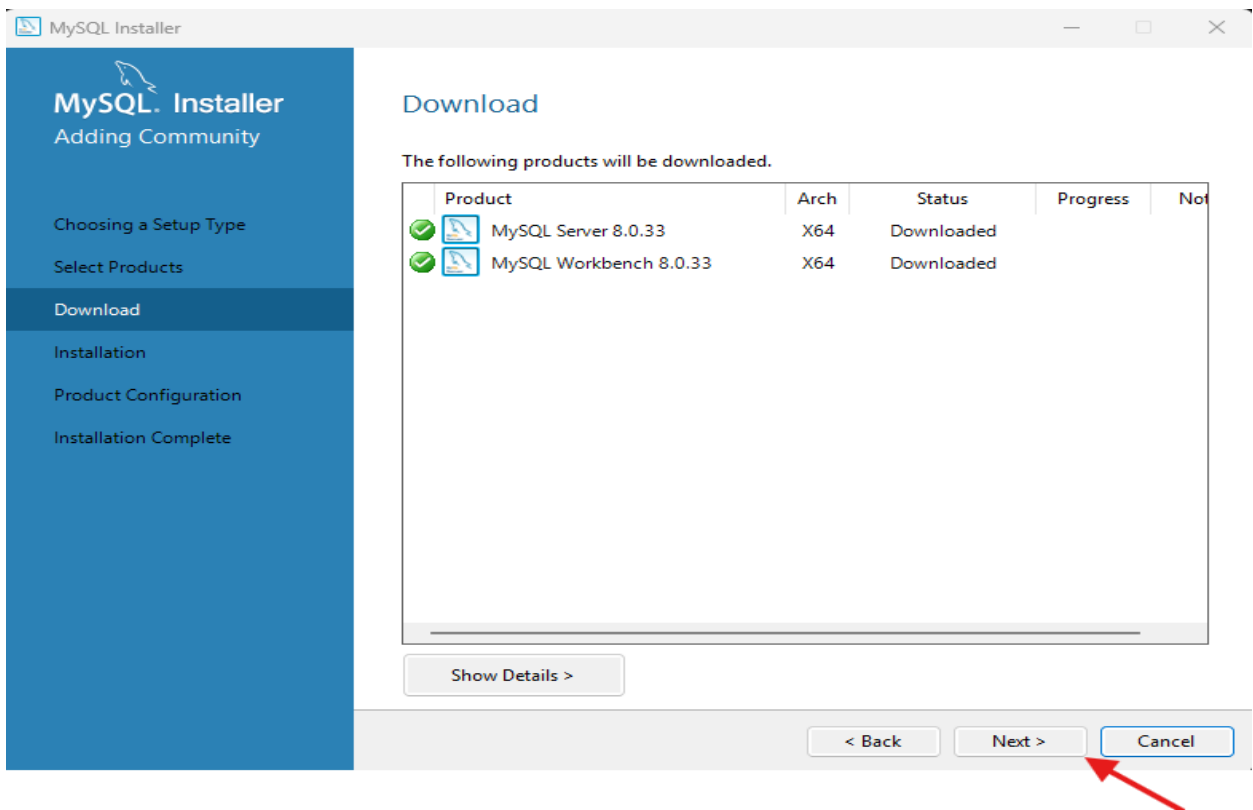
## Step – 9

We will click [Execute] button to download the following packages.



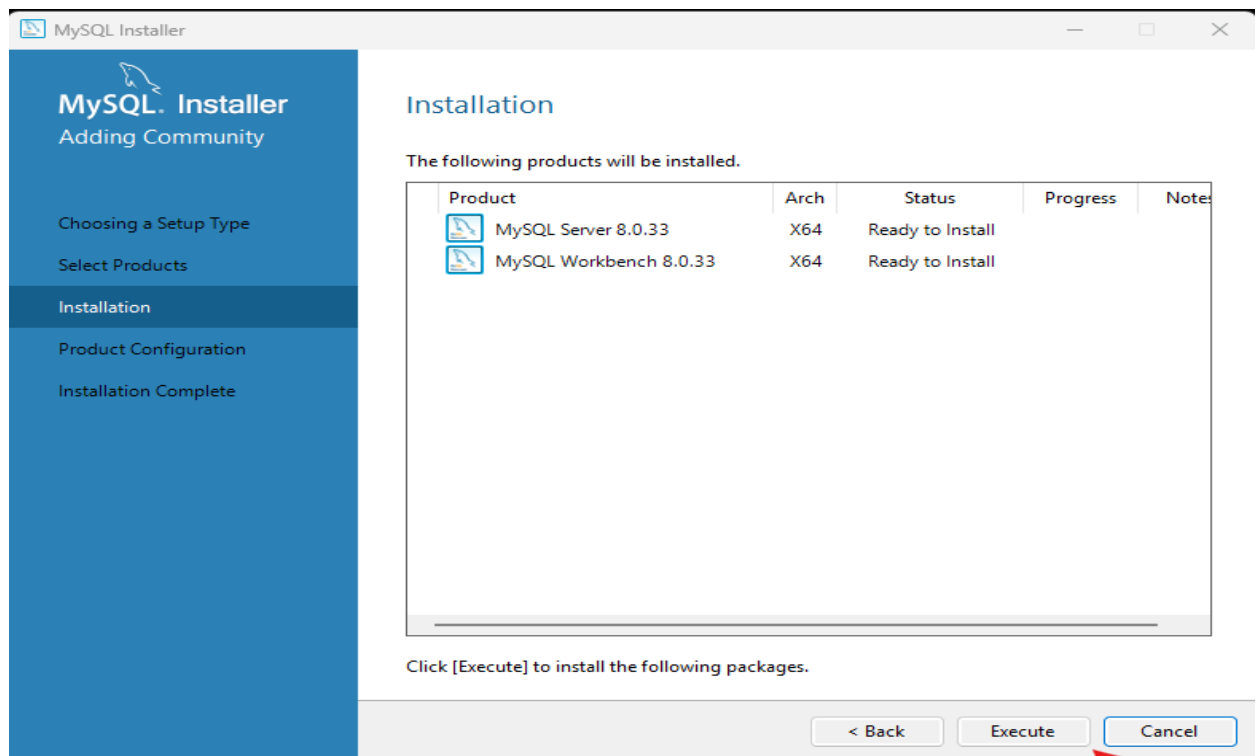
## Step – 10

After choosen packages downloaded. Press the Next button.



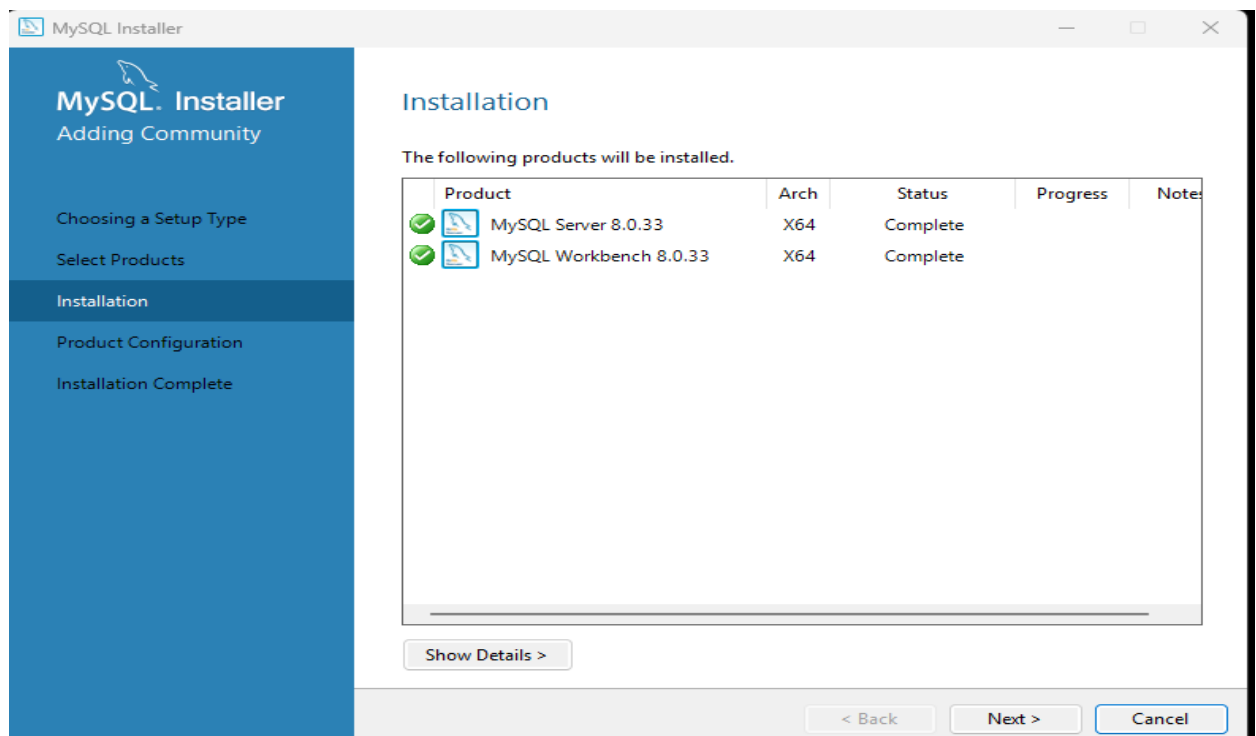
## Step – 11

Click [Execute] button to install the following packages.



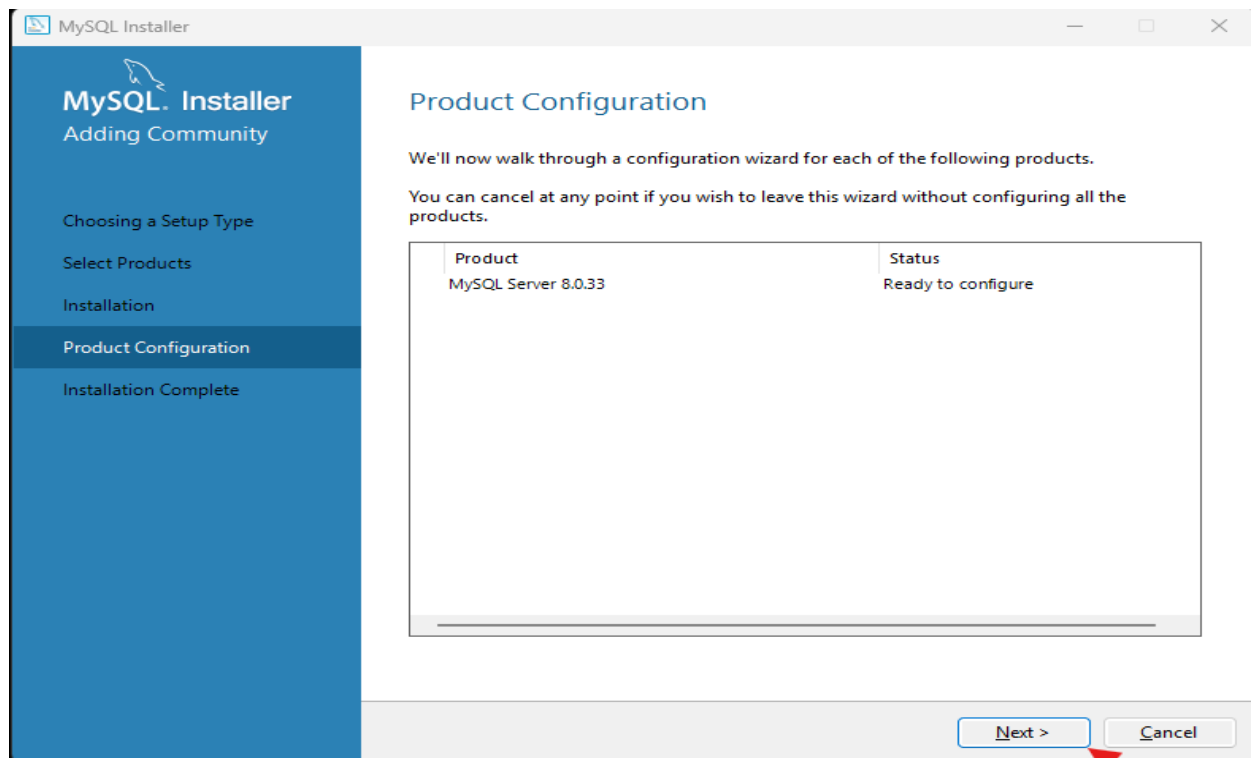
## Step – 12

After chosen packages installed. Click Next button.



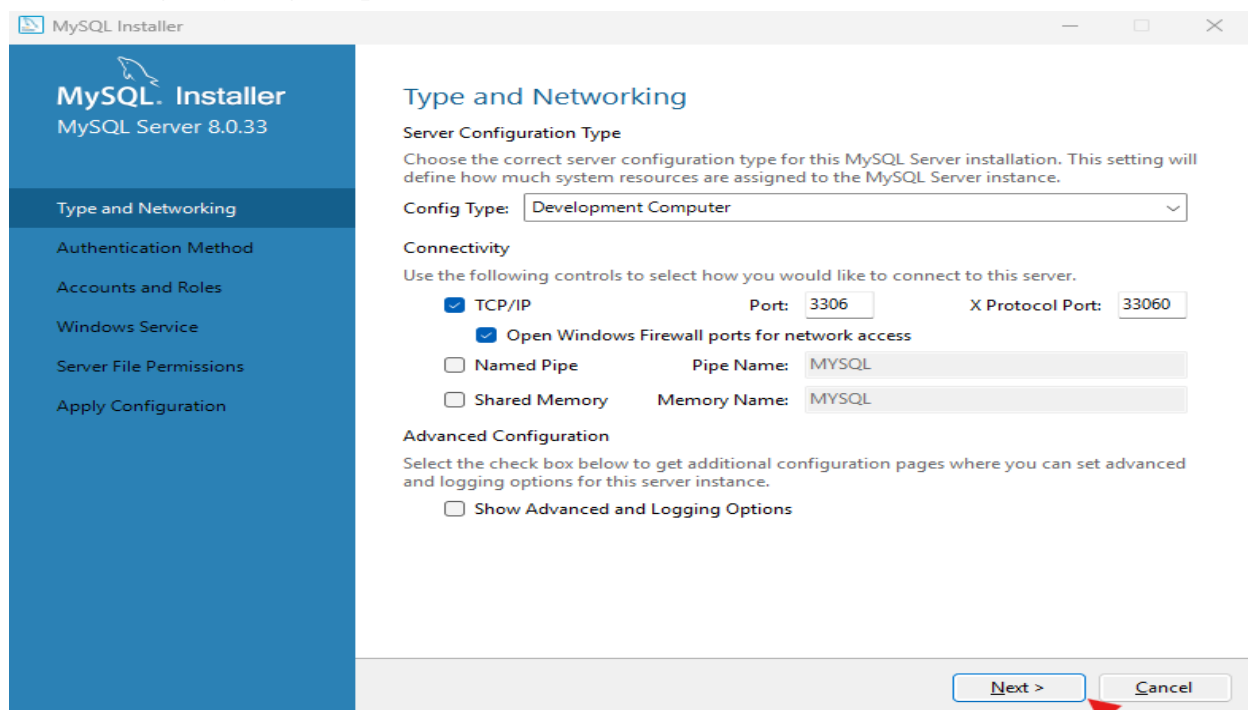
### Step -13

MySQL Server 8.0.33 is ready to configure. Click the Next button.



### Step – 14

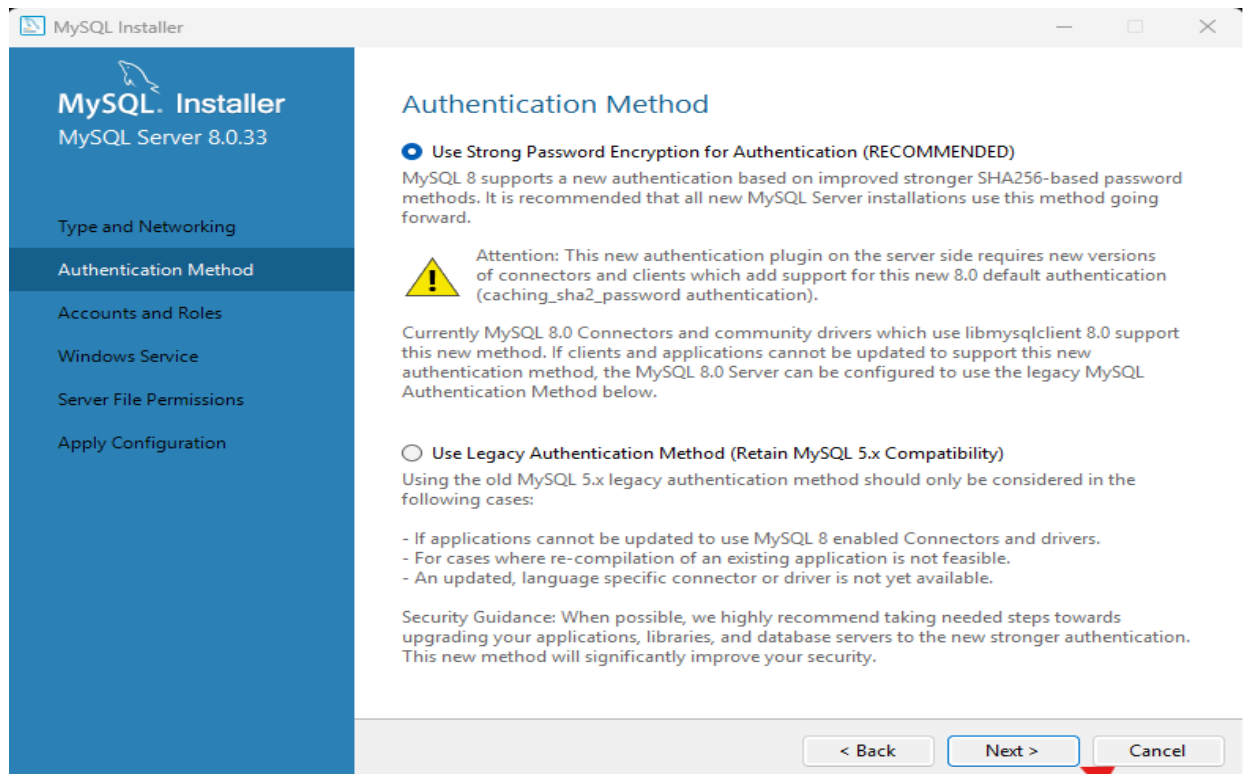
Do not change anything and press the Next button.





## Step – 15

Choose the **RECOMMENDED** option and press the Next button.



The screenshot shows the 'Authentication Method' screen in the MySQL Installer. The left sidebar lists the installation steps: Type and Networking, Authentication Method (selected), Accounts and Roles, Windows Service, Server File Permissions, and Apply Configuration. The main area is titled 'Authentication Method' and contains two radio button options. The first option, 'Use Strong Password Encryption for Authentication (RECOMMENDED)', is selected. Below it, a yellow warning icon is present. The second option is 'Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'. A red arrow points to the 'Next >' button.

MySQL Installer  
MySQL Server 8.0.33

Type and Networking  
Authentication Method  
Accounts and Roles  
Windows Service  
Server File Permissions  
Apply Configuration

### Authentication Method

☒ Use Strong Password Encryption for Authentication (RECOMMENDED)

MySQL 8 supports a new authentication based on improved stronger SHA256-based password methods. It is recommended that all new MySQL Server installations use this method going forward.

**Attention:** This new authentication plugin on the server side requires new versions of connectors and clients which add support for this new 8.0 default authentication (caching\_sha2\_password authentication).

Currently MySQL 8.0 Connectors and community drivers which use libmysqlclient 8.0 support this new method. If clients and applications cannot be updated to support this new authentication method, the MySQL 8.0 Server can be configured to use the legacy MySQL Authentication Method below.

☐ Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)

Using the old MySQL 5.x legacy authentication method should only be considered in the following cases:

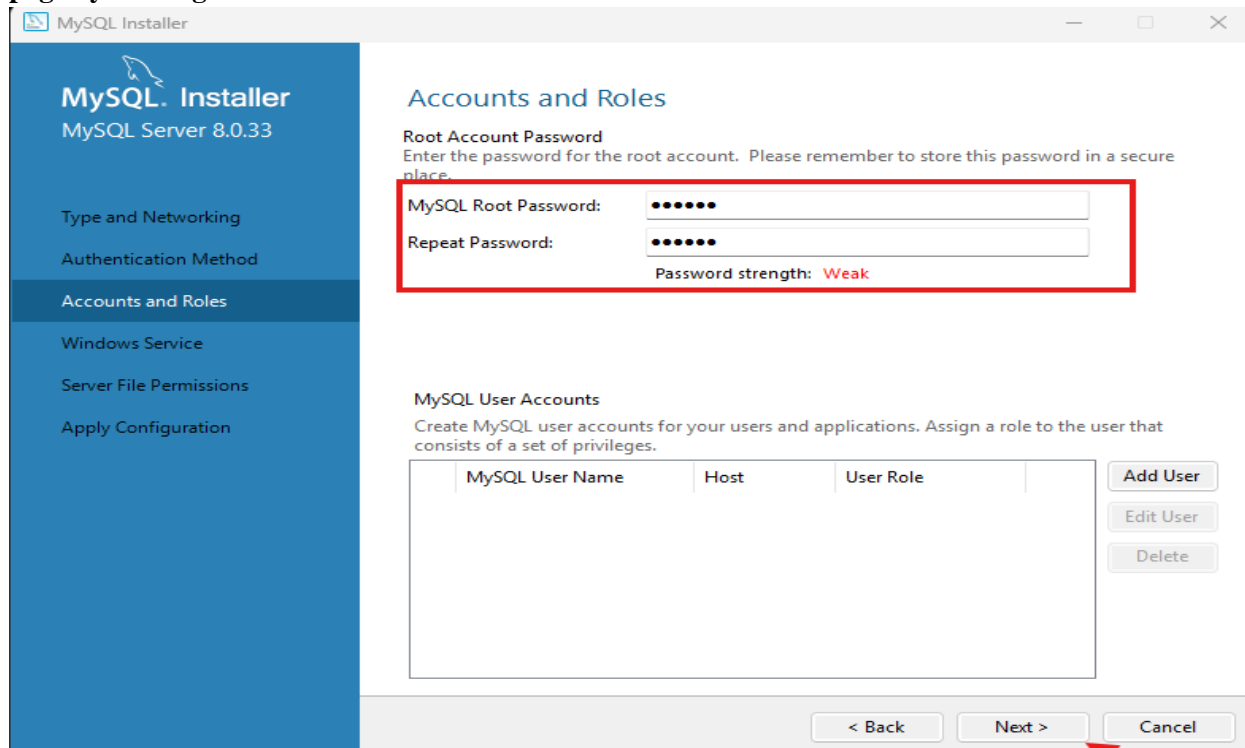
- If applications cannot be updated to use MySQL 8 enabled Connectors and drivers.
- For cases where re-compilation of an existing application is not feasible.
- An updated, language specific connector or driver is not yet available.

Security Guidance: When possible, we highly recommend taking needed steps towards upgrading your applications, libraries, and database servers to the new stronger authentication. This new method will significantly improve your security.

< Back   Next >   Cancel

## Step – 16

We specify a password for the "root" user in the configuration section. We go to the next page by clicking "finish" in this section.



The screenshot shows the 'Accounts and Roles' screen in the MySQL Installer. The left sidebar is the same as in Step 15. The main area is titled 'Accounts and Roles' and contains a section for 'Root Account Password' with two input fields: 'MySQL Root Password:' and 'Repeat Password:'. A red box highlights these fields. Below them, the 'Password strength' is indicated as 'Weak'. There is also a section for 'MySQL User Accounts' with a table to create new users and buttons to 'Add User', 'Edit User', and 'Delete'. At the bottom right, there are three buttons: '< Back', 'Next >', and 'Cancel'. A red arrow points to the 'Next >' button.

MySQL Installer  
MySQL Server 8.0.33

Type and Networking  
Authentication Method  
Accounts and Roles  
Windows Service  
Server File Permissions  
Apply Configuration

### Accounts and Roles

**Root Account Password**  
Enter the password for the root account. Please remember to store this password in a secure place.

MySQL Root Password:

Repeat Password:

Password strength: **Weak**

**MySQL User Accounts**  
Create MySQL user accounts for your users and applications. Assign a role to the user that consists of a set of privileges.

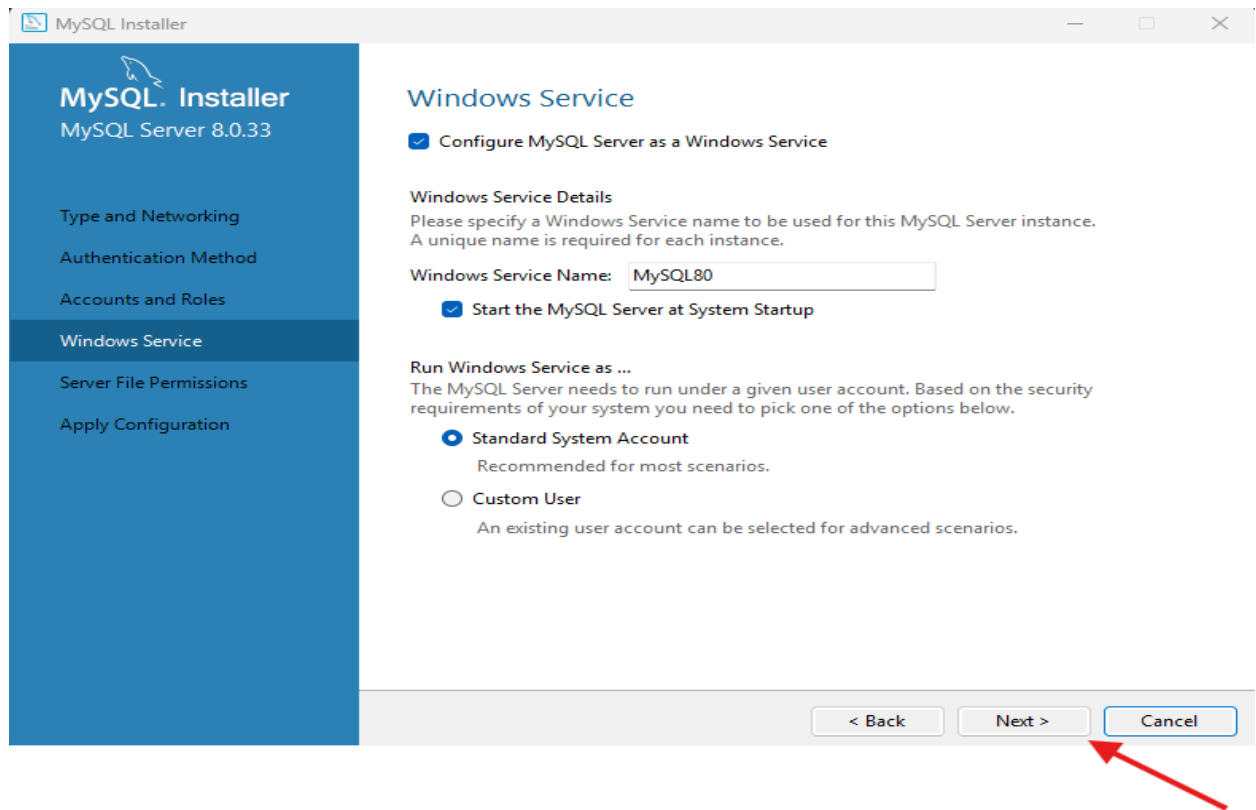
MySQL User Name	Host	User Role
-----------------	------	-----------

Add User  
Edit User  
Delete

< Back   Next >   Cancel

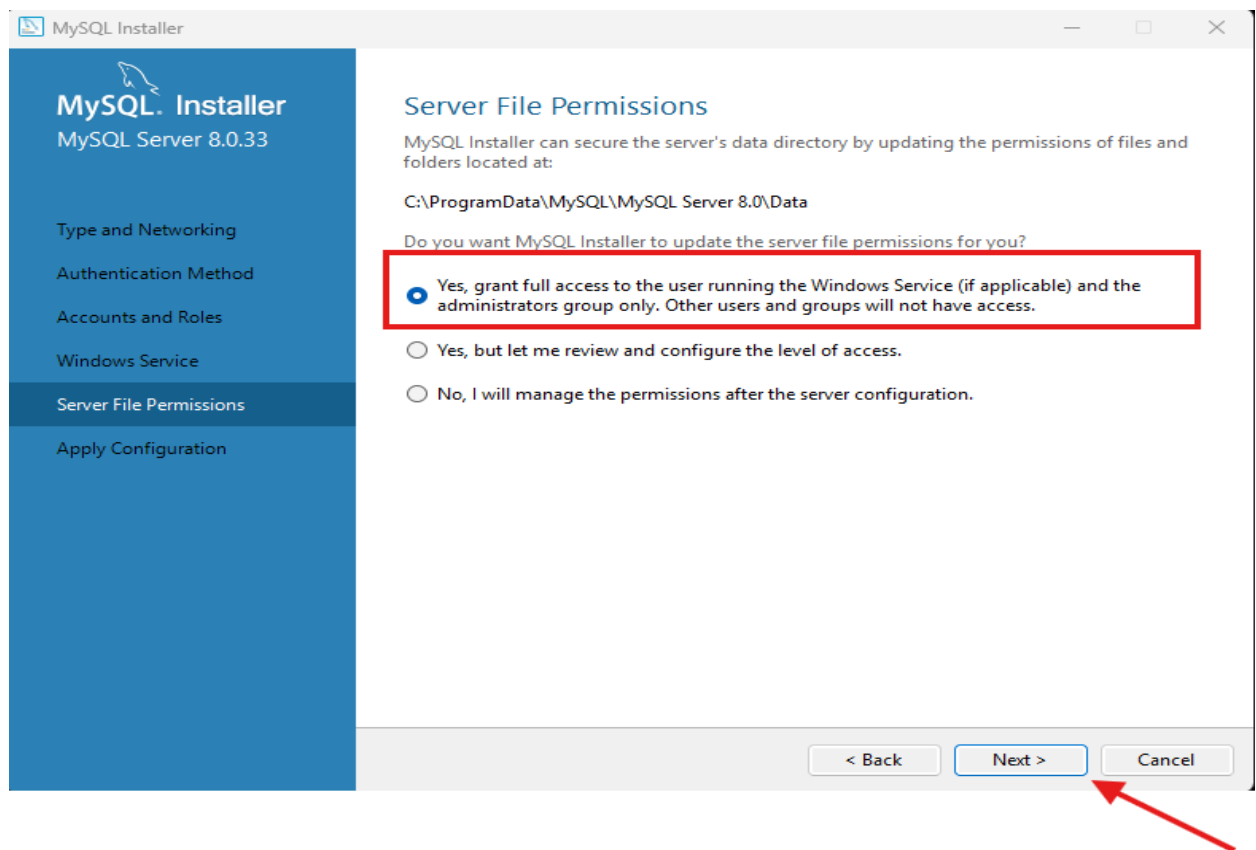
## Step – 17

Do not change any options and click the Next button.



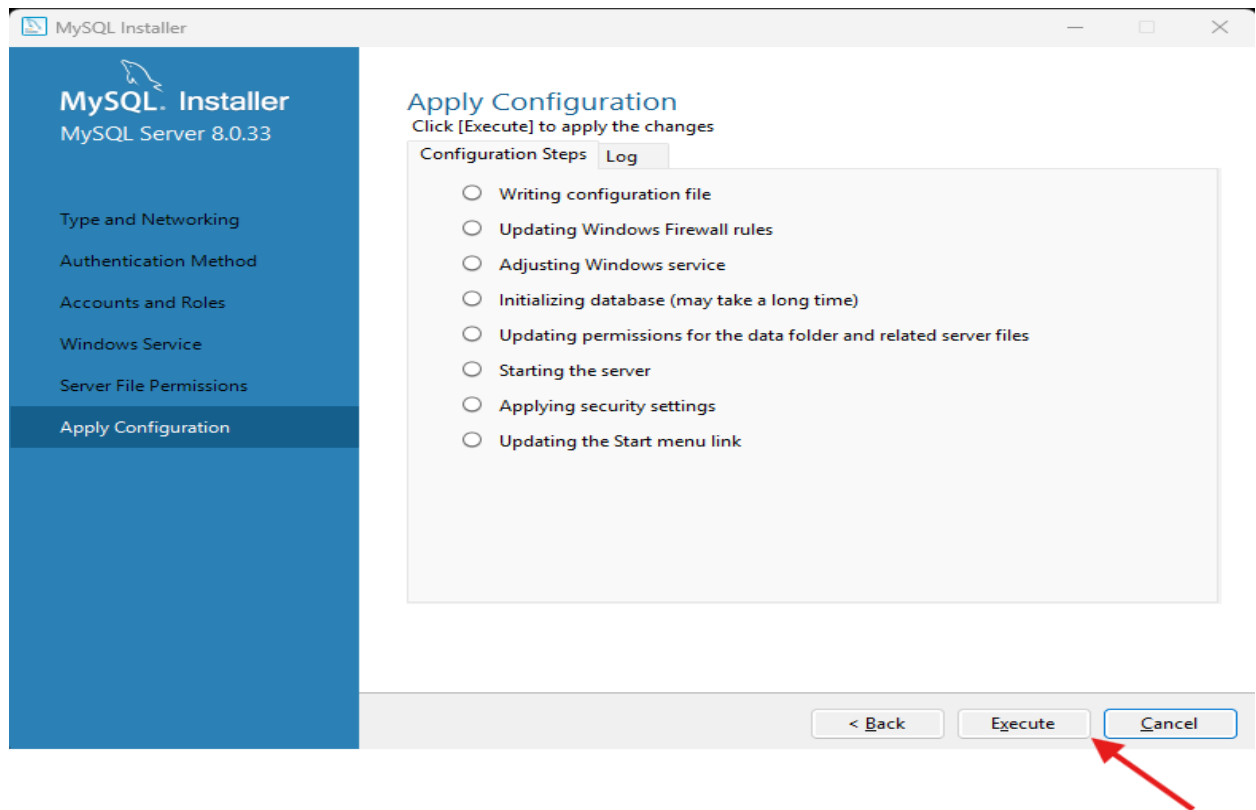
## Step – 18

Choose the option in the red box and press Next button.



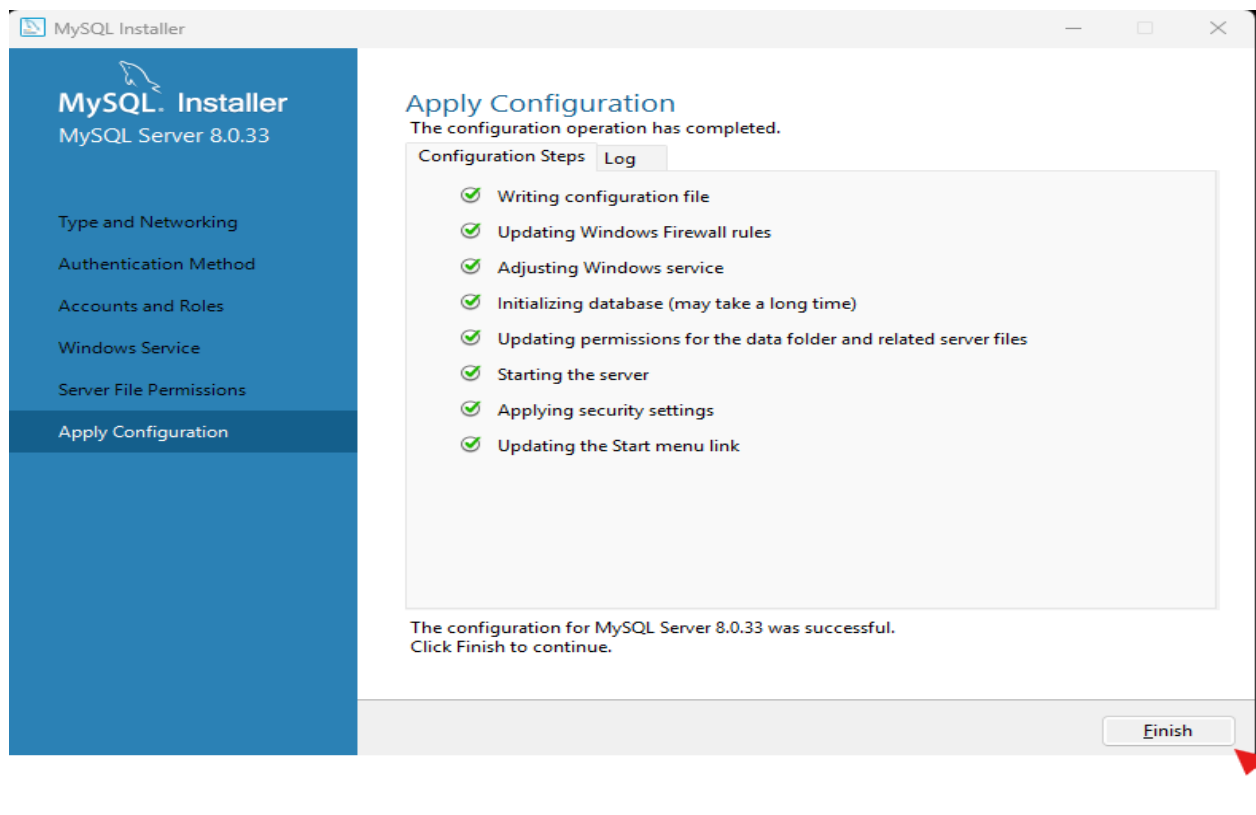
## Step – 19

Click the [Execute] button to apply changes.



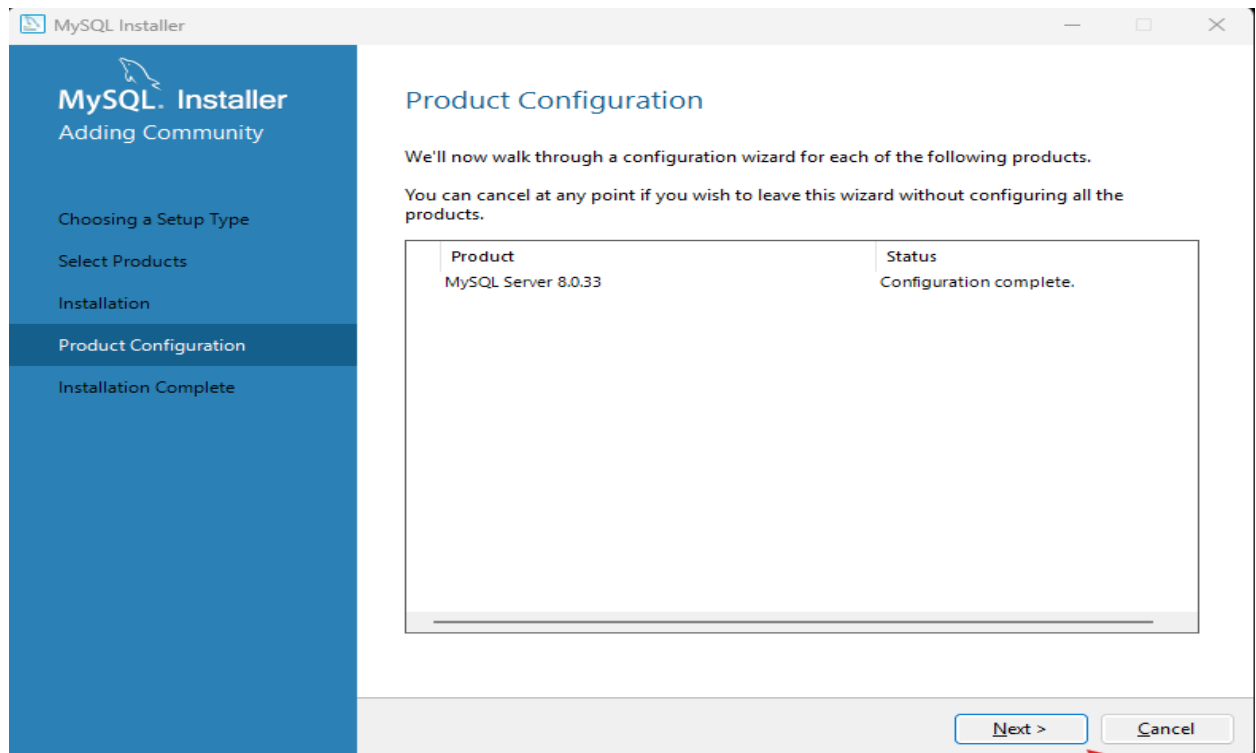
## Step – 20

After the configuration has completed press the Finish button.



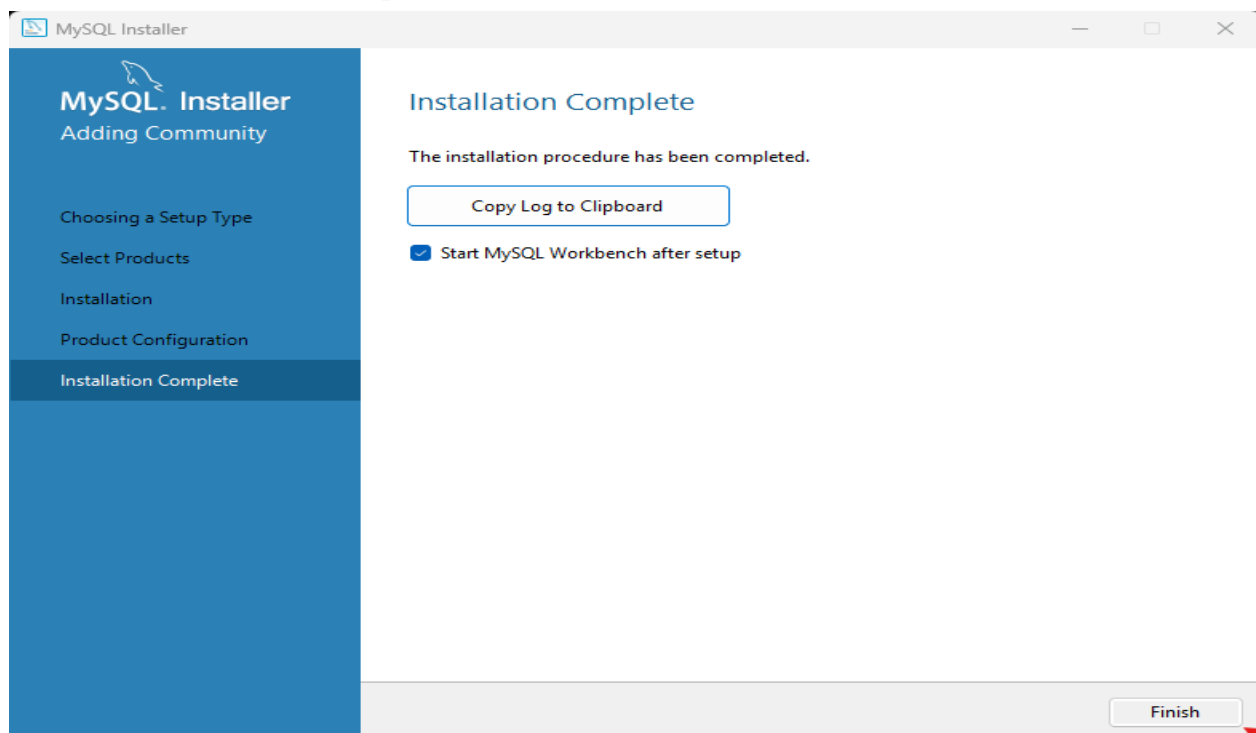
## Step – 21

Configuration has completed. Click the Press button.



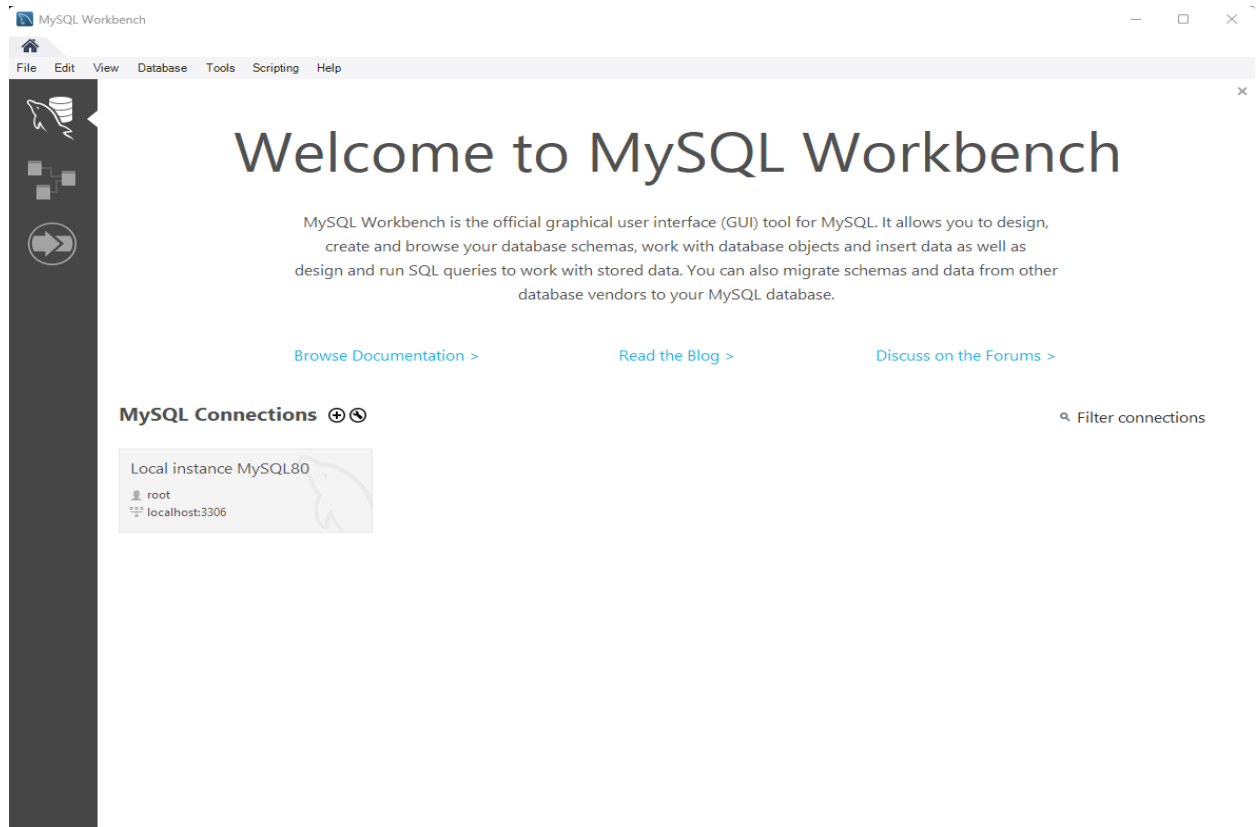
## Step – 22

After that the Installation completed. Press the Finish button.



## Step – 23

**ALL DONE. You are welcome to MySQL Workbench.**



## 4. Monitoring & Logging

The system features advanced monitoring and logging mechanisms to track bus status, rental processes, and financial transactions in real time. The admin dashboard provides detailed analytics on bus location, mileage, maintenance schedules, and rental operations. All rental agreements, payment transactions, bus movements, and system errors are securely recorded. Potential performance issues and security vulnerabilities are regularly analyzed. Additionally, automated notifications alert administrators about payment failures, upcoming maintenance, and anormal fuel consumption, ensuring timely interventions.

## 5. Security Considerations

### 5.1 Authentication & Authorization

- JWT-based authentication.
- Role-based access control (RBAC).

### 5.2 Data Protection

- Encrypted data at rest and in transit (AES-256, TLS 1.2+).
- Regular security audits and vulnerability scanning.

### 5.3 DDoS Protection

- Cloudflare / AWS Shield for mitigation.
- Rate limiting on API endpoints.

## 6. Backup & Disaster Recovery Plan

The system implements a robust Backup and Disaster Recovery Plan to ensure data security and business continuity.

As part of the Backup Strategy, the database is protected with daily full backups and hourly incremental backups. Static assets are securely stored using version-controlled backups.

Under the Disaster Recovery Plan, a multi-region deployment ensures high availability. The system is designed to restore services within less than 15 minutes (RTO) and minimize data loss with a recovery point objective (RPO) of under 5 minutes. In case of hardware failures, cyber threats, or unexpected outages, the system maintains operations with minimal disruption.

## 7. Conclusion

This deployment plan establishes a structured approach to ensure the secure, reliable, and scalable deployment of the bus rental and revenue management system. It guarantees minimal downtime, robust monitoring, and a well-defined rollback strategy to maintain system integrity and operational efficiency.

