

SQL (Structured Query Language) Notes: week 5

What is SQL?

- SQL is the standard language for dealing with Relational Databases.
- It is used to interact with databases to perform operations like inserting, searching, updating, and deleting database records. CRUD FUNCTION

How to Use SQL:

- SQL statements are used to interact with a database.
- In this example, we select all records from the "Customers" table:

sqlCopy code

```
SELECT * FROM Customers;
```

Keep in Mind That...

- SQL keywords are NOT case sensitive, which means that "select" is the same as "SELECT".
- In this tutorial, we will write all SQL keywords in upper-case.

Semicolon after SQL Statements:

- Some database systems require a semicolon at the end of each SQL statement.
- A semicolon is the standard way to separate each SQL statement in systems that allow multiple SQL statements to be executed in the same call to the server.
- In this tutorial, we will use a semicolon at the end of each SQL statement.

Some of the Most Important SQL Commands:

1. SELECT - extracts data from a database.
2. UPDATE - updates data in a database.
3. DELETE - deletes data from a database.
4. INSERT INTO - inserts new data into a database.
5. CREATE DATABASE - creates a new database.
6. ALTER DATABASE - modifies a database.
7. CREATE TABLE - creates a new table.
8. ALTER TABLE - modifies a table.
9. DROP TABLE - deletes a table.
10. CREATE INDEX - creates an index (search key).
11. DROP INDEX - deletes an index.



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SQL SYNTAX

SQL, which stands for Structured Query Language, is a domain-specific language used for managing and manipulating relational databases. It allows you to interact with databases to retrieve, modify, and manage data efficiently.

SQL Syntax:

SQL follows a structured syntax for writing queries and commands. Below are some key components:

SELECT: Used to retrieve data from one or more tables.

SELECT column1, column2 FROM table_name;

FROM: Specifies the table(s) from which to retrieve data.

SELECT column1, column2 FROM table_name;

WHERE: Filters data based on specific conditions.

SELECT column1, column2 FROM table_name WHERE

condition; **INSERT INTO:** Adds new data to a table.

INSERT INTO table_name (column1, column2) VALUES (value1, value2);

SQL ALTER TABLE: Add a Column

UPDATE: Modifies existing data in a table.

```
UPDATE table_name SET column1 = new_value WHERE condition;
```

DELETE FROM: Removes data from a table.

```
DELETE FROM table_name WHERE condition;
```

SQL Commands:

SQL commands are categorized into four main types:

Data Query Language (DQL): Used for data retrieval.

Example:

```
SELECT * FROM employees;
```

Data Definition Language (DDL): Used for defining, altering, or deleting database structures.

Example:

```
INSERT INTO customers (name, email) VALUES ('John Doe', 'john@example.com');
```

Data Control Language (DCL): Used for managing permissions and access.

Example:

```
GRANT SELECT ON employees TO user1;
```

SQL Literals:

SQL supports various types of literals:

String literals: Enclosed in single quotes.

```
SELECT name FROM employees WHERE department = 'HR';
```

Numeric literals: Numeric values.

```
UPDATE products SET price = 19.99 WHERE product_id = 123;
```

Date literals: Representing dates.

```
INSERT INTO orders (order_date) VALUES ('2023-10-31');
```

Boolean literals: Representing true or false values (varies by database system).

SQL Keywords:

SQL includes reserved keywords with specific meanings and functions:

SELECT: Used to retrieve data.

FROM: Specifies the source of data.

WHERE: Filters data based on conditions.

INSERT INTO: Adds new data.

UPDATE: Modifies existing data.

DELETE FROM: Removes data.

SQL Identifiers:

Identifiers are used to name database objects like tables and columns. They follow specific rules:

- Must start with a letter.

- Can contain letters, numbers, and underscores.

- Are often case-insensitive (varies by database system).

```
CREATE TABLE employees (  
    employee_id INT,  
    first_name VARCHAR(50),  
    last_name VARCHAR(50)  
)
```

Comments in SQL:

Comments enhance code readability and documentation. SQL supports two types:

Single-line comments (prefixed with --):

-- This is a single-line comment.

Multi-line comments (enclosed in /* and */):

```
/*
```

This is a multi-line comment.

It can span multiple lines.

```
*/
```

In conclusion, SQL is a powerful language for managing databases, featuring a structured syntax, various commands, literals, keywords, and identifiers. Comments are used to annotate code for better understanding and maintenance.

SQL ALTER TABLE: Drop a Column

Sometimes, you may need to remove a column from a table if it's no longer needed or if the schema changes. The ALTER TABLE statement can be used to drop or delete a column. Here's the syntax for dropping a column:

-- Syntax for dropping a column

```
ALTER TABLE table_name
```

```
    DROP COLUMN column_name;
```

table_name: Specify the name of the table from which you want to remove the column.

column_name: Indicate the name of the column you wish to drop.

Example:

Suppose you want to remove the "Phone" column from the "Employees" table:

-- Dropping the "Phone" column from the "Employees" table



```
ALTER TABLE Employees
```

```
  DROP COLUMN Phone;
```

This SQL statement will remove the "Phone" column from the "Employees" table, effectively eliminating it from the table's structure.



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Introduction to SQL DROP TABLE Statement

In SQL, the DROP TABLE statement is a powerful command used to remove an existing table from a database.

This operation is essential when you no longer need a particular table, or you want to start afresh by deleting all the data and the table's structure.

The DROP TABLE statement should be used with caution since it irreversibly deletes the table and its contents.

Here's an introduction to the SQL DROP TABLE statement and examples illustrating its usage.

SQL DROP TABLE Examples

Example 1: Basic Table Deletion

The simplest use case for the DROP TABLE statement involves removing a single table from a database.

Here's the basic syntax:

-- Syntax for dropping a single table

DROP TABLE table_name;

table_name: Replace this with the name of the table you want to delete.

Example: Let's say you have a table called "Customers," and you want to delete it from the database:

-- Deleting the "Customers" table

```
DROP TABLE Customers;
```

This SQL statement will remove the "Customers" table and all of its associated data from the database.

Example 2: Removing Multiple Tables

You can also use the DROP TABLE statement to remove multiple tables in a single command. This can be useful when you have several tables to delete simultaneously.

Here's how you can do it:

-- Syntax for dropping multiple tables

```
DROP TABLE table_name1, table_name2, ...;
```

table_name1, table_name2, etc.: List the names of the tables you want to delete, separated by commas.

Example:

Suppose you have three tables, "Products," "Orders," and "OrderItems," that you no longer need in your database. You can remove them all at once using the DROP TABLE statement:

-- Deleting multiple tables in one command

```
DROP TABLE Products, Orders, OrderItems;
```

This SQL statement will delete all three tables and their associated data from the database.

RECAP:A Step-by-Step Guide to Installing MySQL and MySQL Workbench on Windows



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Before we begin, make sure you have the following:

- .A computer
- .Administrative access to your computer.

Step 1: Download MySQL Installer

- . Open your web browser and navigate to the MySQL website at <https://dev.mysql.com/downloads/installer/>.
- . Scroll down to the “MySQL Installer” section, make sure “Microsoft Windows” is selected under Select Operating System and click on the “Download” button for the MySQL Installer MSI (both the 2.4M and 331.3M version will work)

Note: This guide uses screenshots that might be hard to read on mobile.

④ MySQL Community Downloads

◀ MySQL Installer

General Availability (GA) Releases Archives ⌂

MySQL Installer 8.0.36

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: **8.0.36**

Select Operating System: **Microsoft Windows**

Windows (x86, 32-bit), MSI Installer (mysql-installer-web-community-8.0.36.0.msi)	8.0.36	2.1M	Download
Windows (x86, 32-bit), MSI Installer (mysql-installer-community-8.0.36.0.msi)	8.0.36	285.3M	Download

We suggest that you use the [MD5 checksums](#) and [GnuPG signatures](#) to verify the integrity of the packages you download.

On the next page, you'll be prompted to log in or create a MySQL account. You can choose "No thanks, just start my download."



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④ MySQL Community Downloads

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Step 2: Install and Configure MySQL

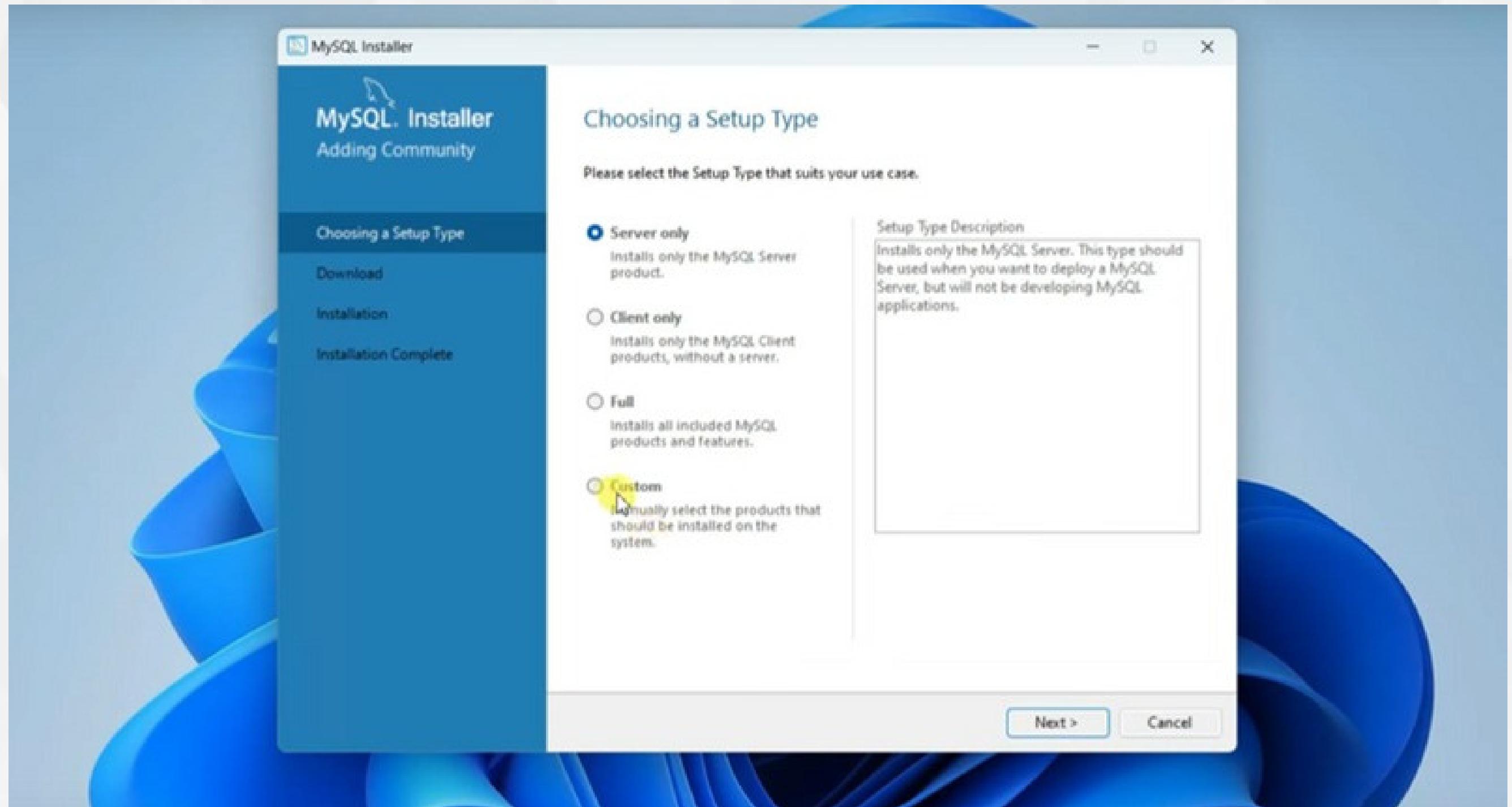
Locate the installer file you just downloaded (e.g., mysql-installer-web-community-x.x.xx.x.msi) and double-click it to run the installer.

In the installer window, choose “Full” under “Setup Type.” This option will install MySQL Server, MySQL Workbench and other components, such as documentation and examples. Then click “Next.”

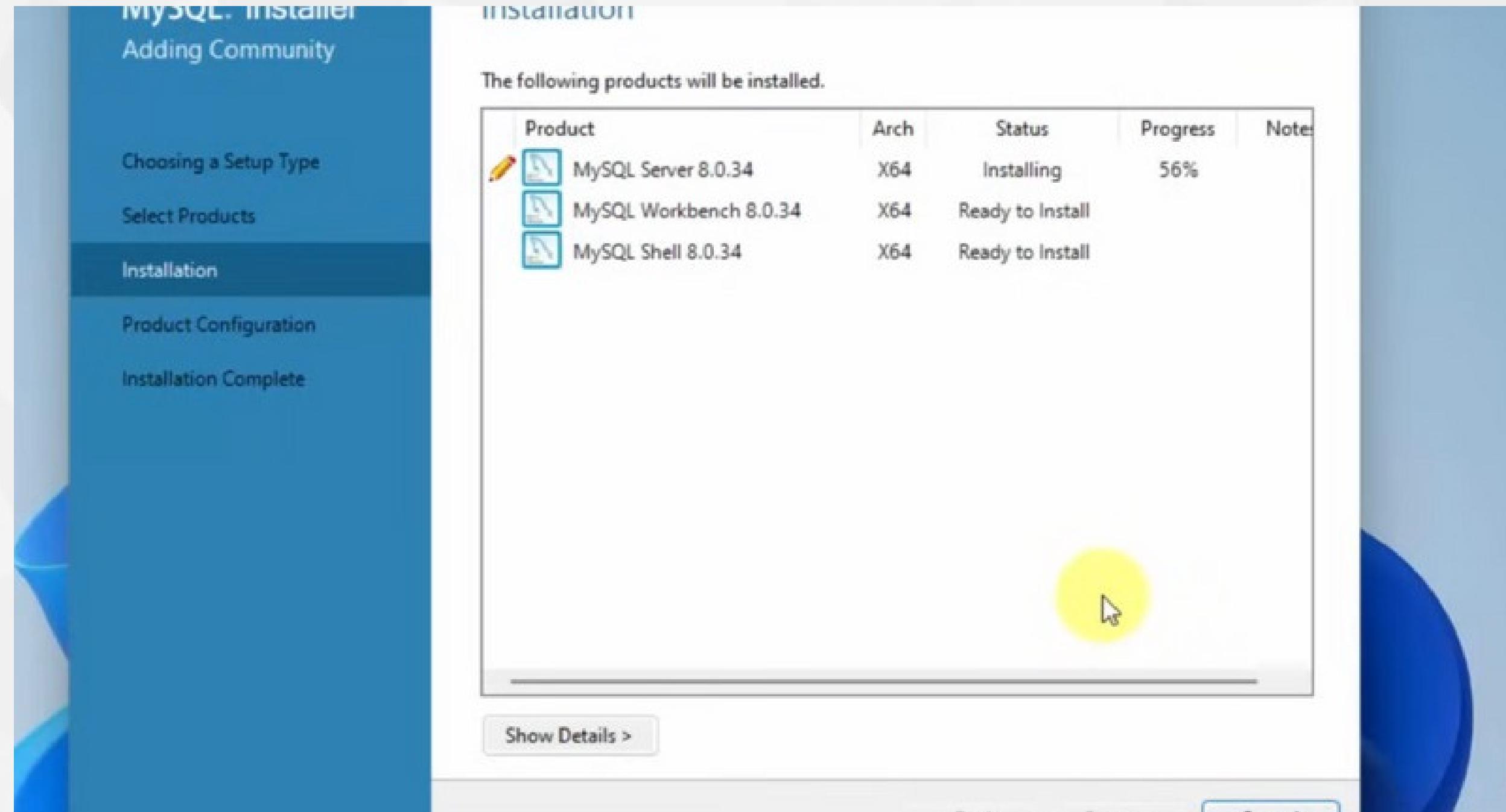
You can also choose “Custom” and only install MySQL Server and MySQL Workbench In the installer window, choose “Full” under “Setup Type.” This

option will install MySQL Server, MySQL Workbench and other components, such as documentation and examples. Then click “Next.”

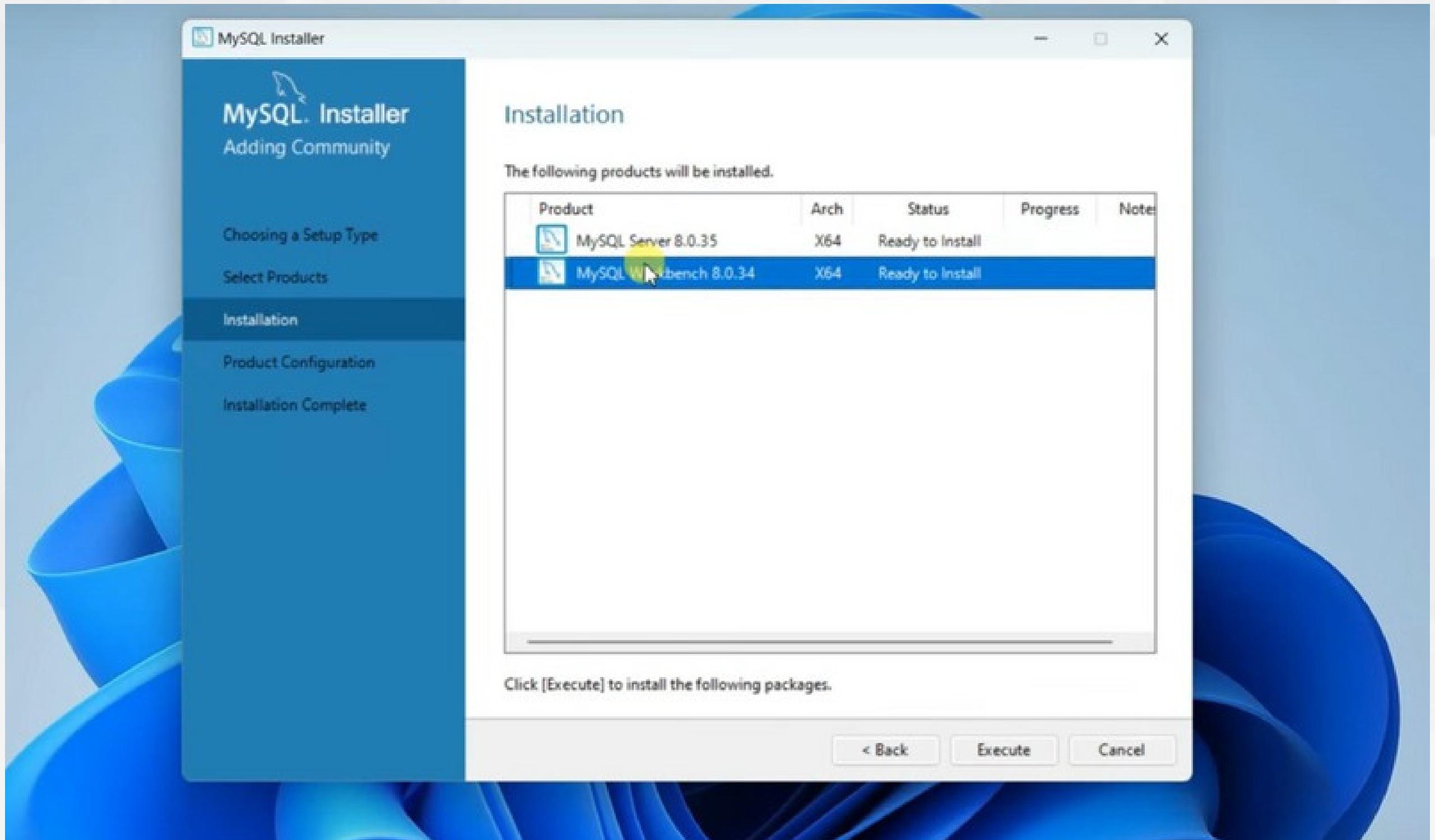
You can also choose “Custom” and only install MySQL Server and MySQL Workbench.



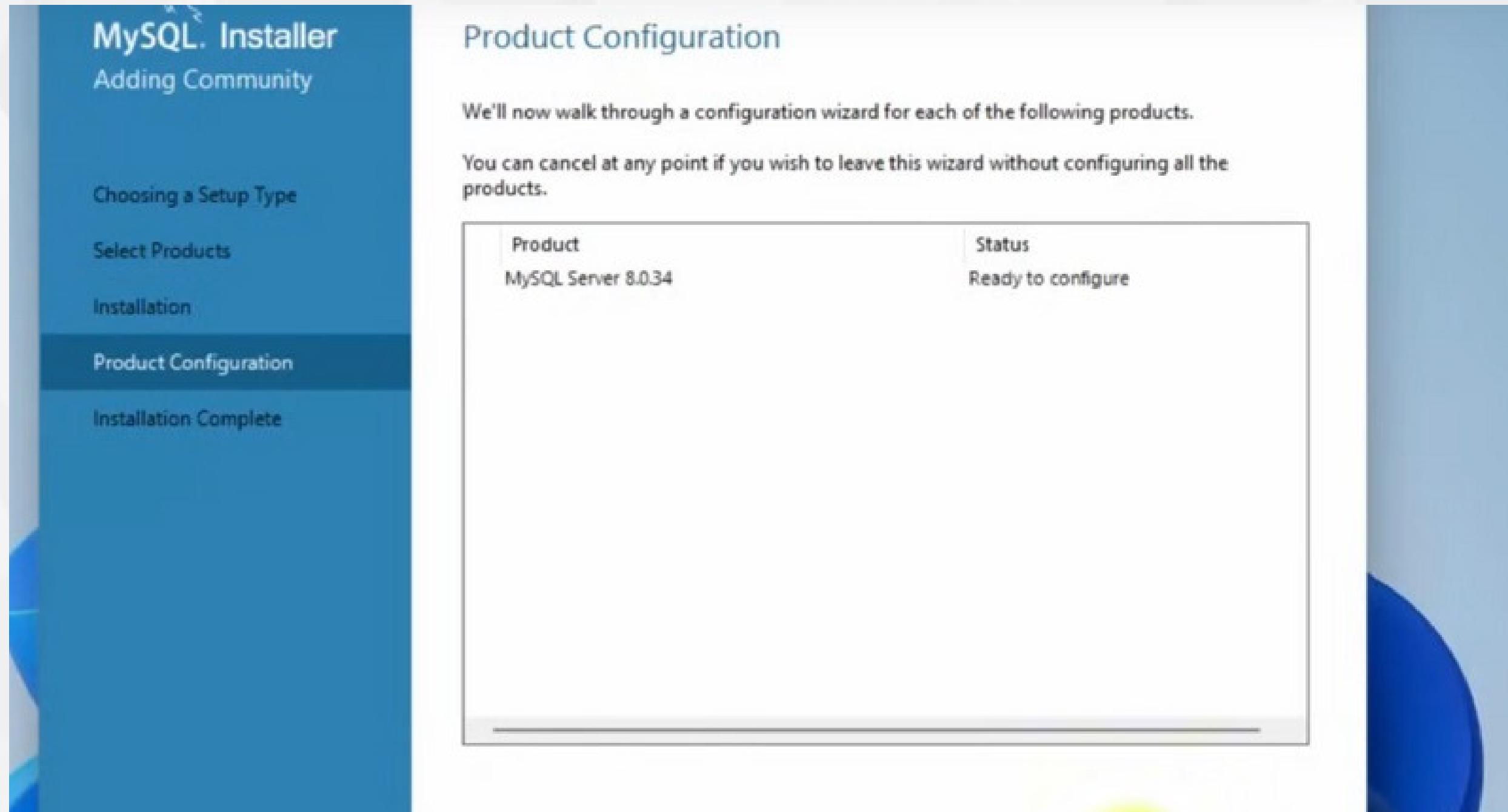
click “Next”



After all products have been downloaded sucessfully, as indicated by the green checkmark, click “Next.”



click “Next”



The screenshot shows the MySQL Installer interface. The title bar says "MySQL® Installer" and "Adding Community". On the left, a vertical navigation menu lists: "Choosing a Setup Type", "Select Products", "Installation", "Product Configuration" (which is highlighted in blue), and "Installation Complete". The main content area is titled "Product Configuration" and contains the following text:

We'll now walk through a configuration wizard for each of the following products.

You can cancel at any point if you wish to leave this wizard without configuring all the products.

Product	Status
MySQL Server 8.0.34	Ready to configure

click “Next.”

MySQL Server 8.0.34

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Server File Permissions

Apply Configuration

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  Cancel

click “Next.”

MySQL® Installer
MySQL Server 8.0.34

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:

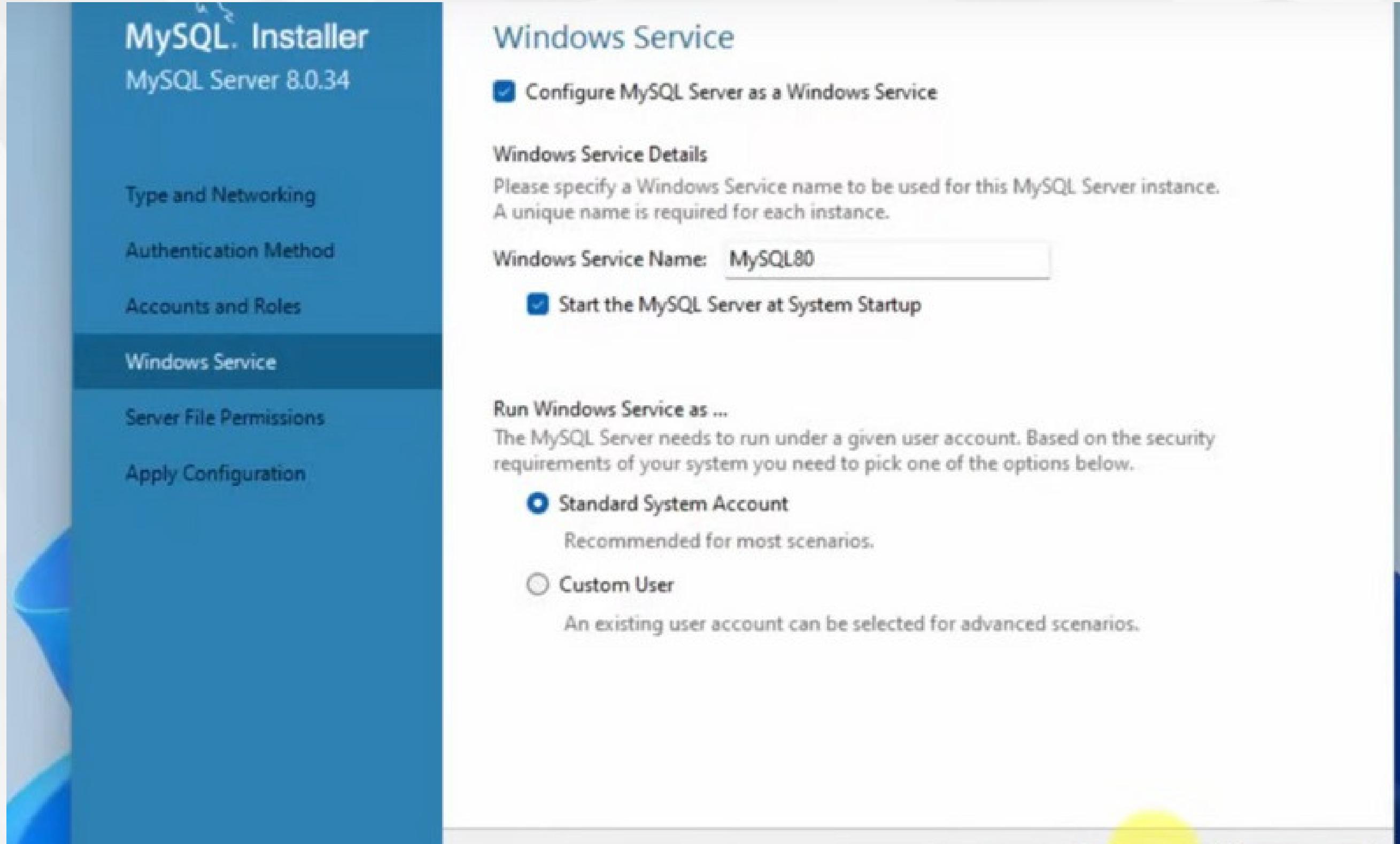
Password strength: Medium

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

key in password and click “Next”



The image shows the MySQL Installer for MySQL Server 8.0.34. The left sidebar lists several configuration options: Type and Networking, Authentication Method, Accounts and Roles, Windows Service (which is selected), Server File Permissions, and Apply Configuration. The main panel is titled "Windows Service" and contains the following steps:

- Configure MySQL Server as a Windows Service

Windows Service Details
Please specify a Windows Service name to be used for this MySQL Server instance.
A unique name is required for each instance.

Windows Service Name:

Start the MySQL Server at System Startup

Run Windows Service as ...
The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below.

Standard System Account
Recommended for most scenarios.

Custom User
An existing user account can be selected for advanced scenarios.

click “Next”

MySQL Installer

MySQL Server 8.0.34

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Server File Permissions

Apply Configuration

Server File Permissions

MySQL Installer can secure the server's data directory by updating the permissions of files and folders located at:

C:\ProgramData\MySQL\MySQL Server 8.0\Data

Do you want MySQL Installer to update the server file permissions for you?

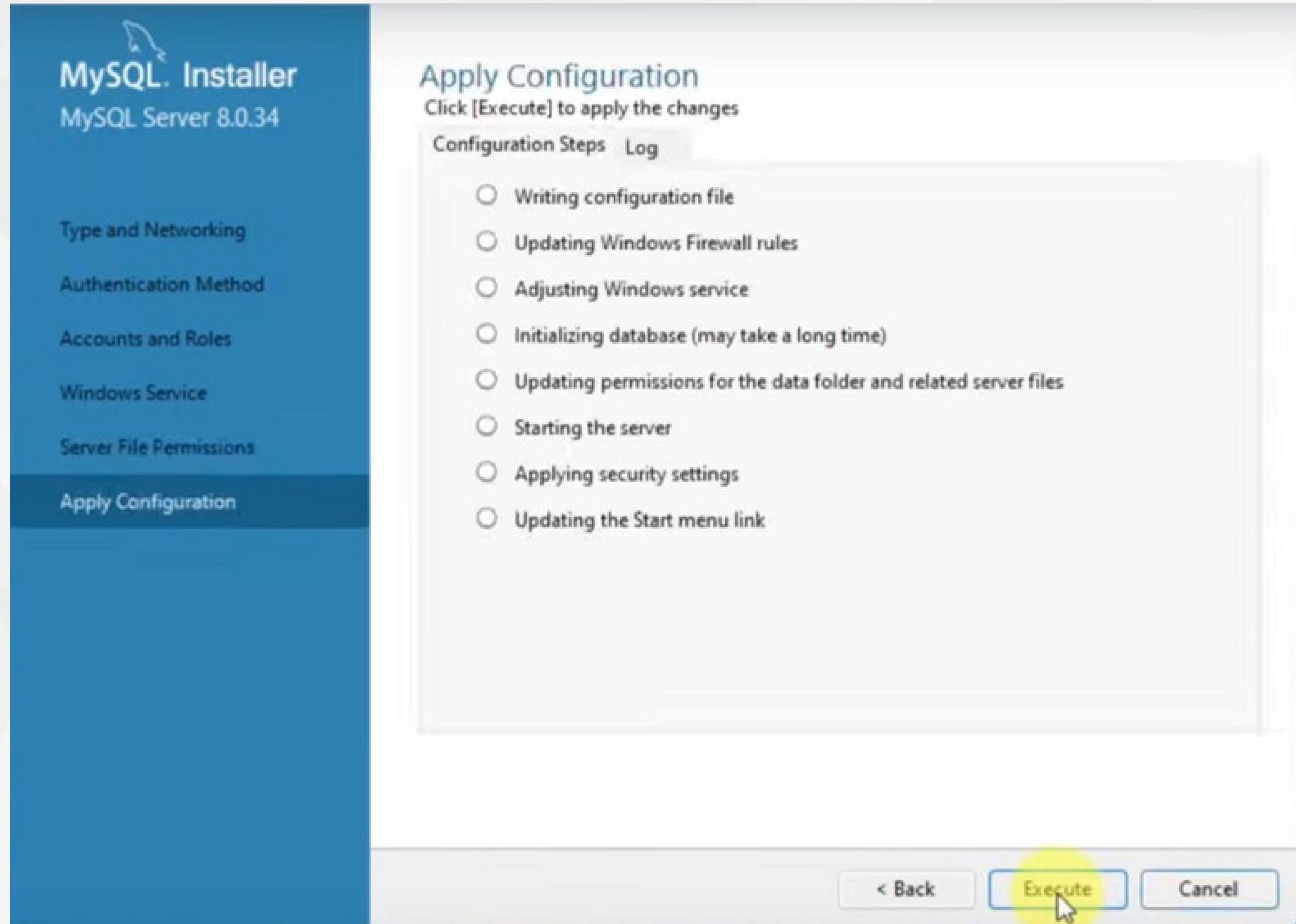
- Yes, grant full access to the user running the Windows Service (if applicable) and the administrators group only. Other users and groups will not have access.
- Yes, but let me review and configure the level of access.
- No, I will manage the permissions after the server configuration.

< Back

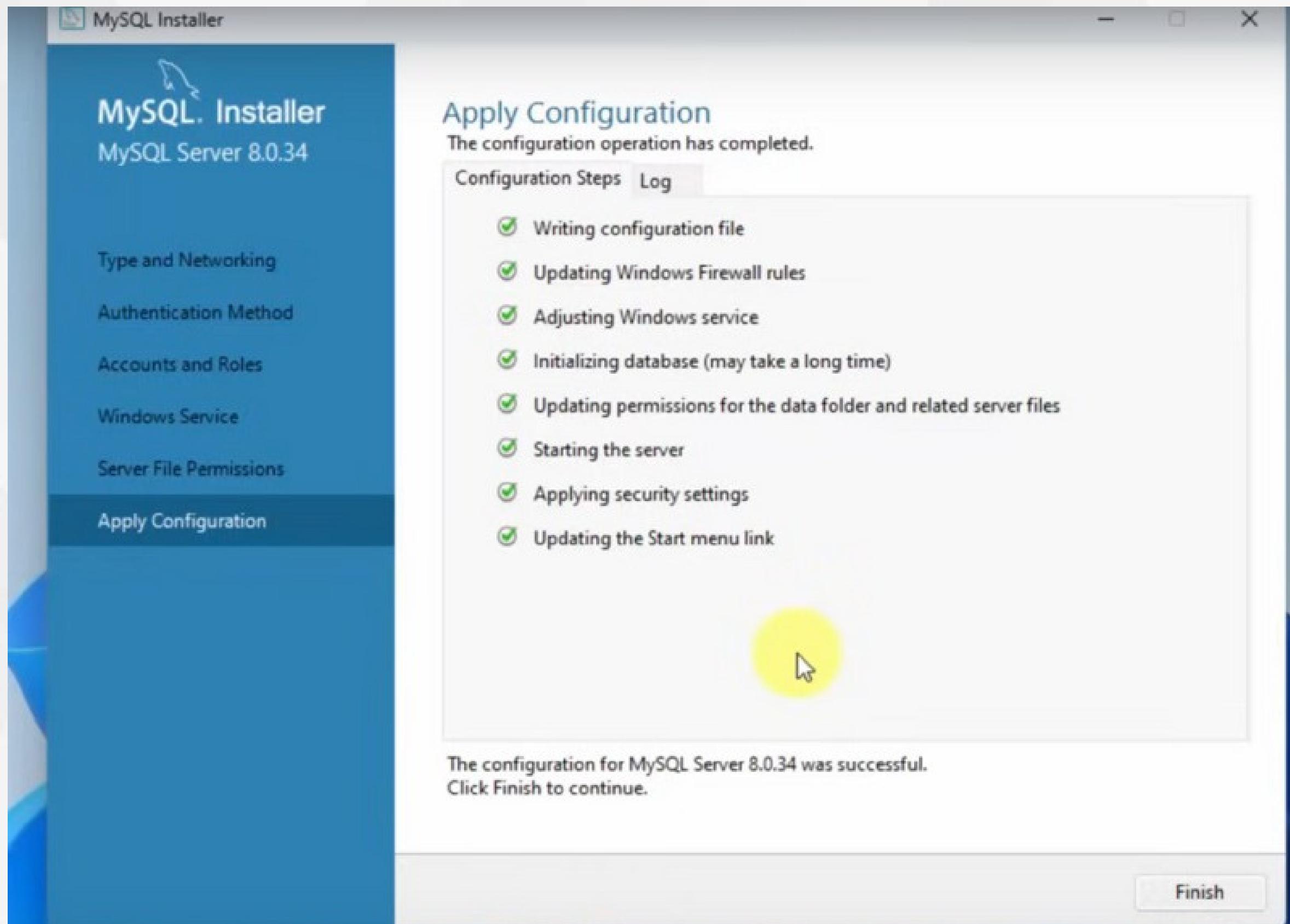
Next >

Cancel

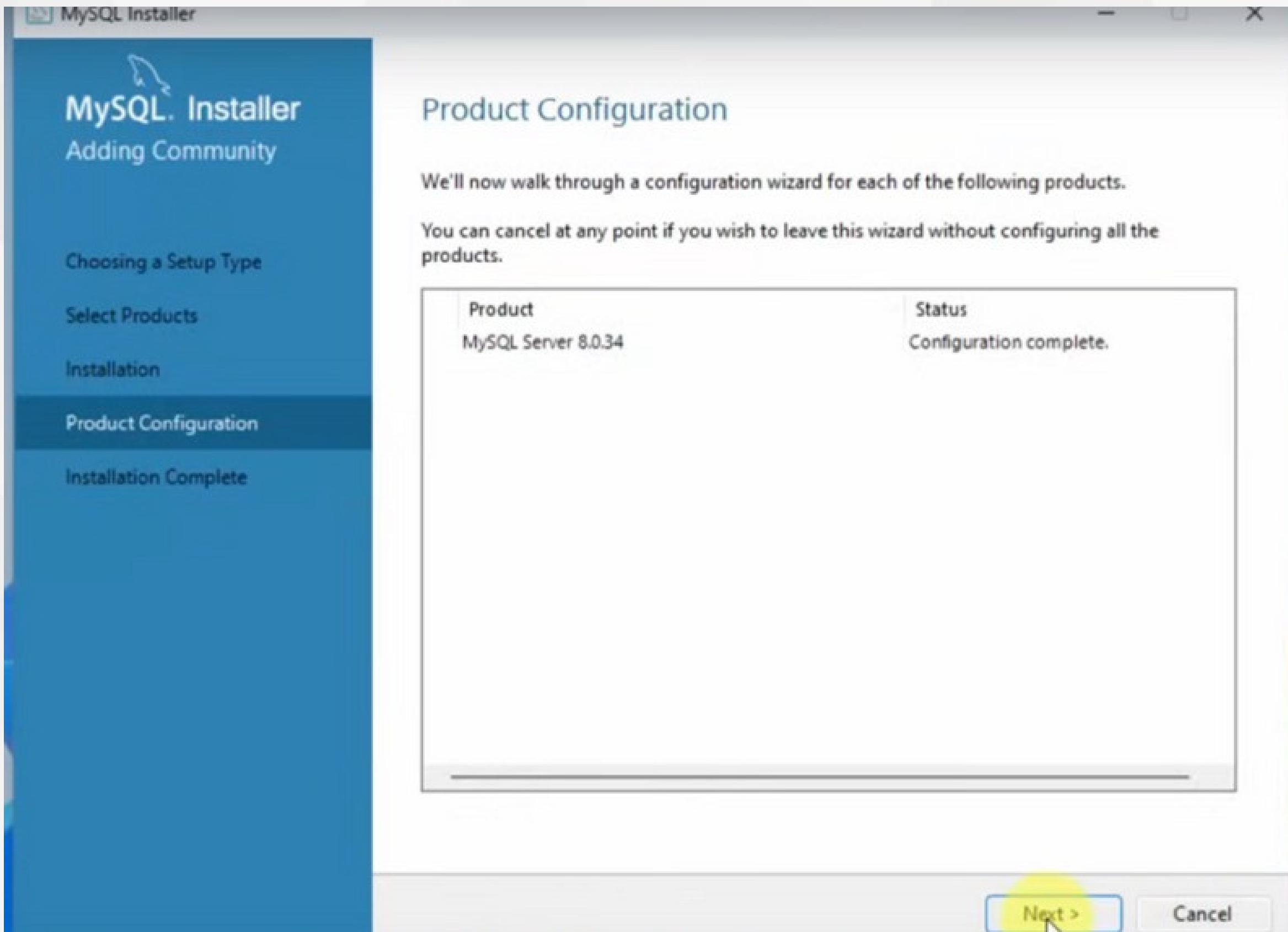
click “Next”



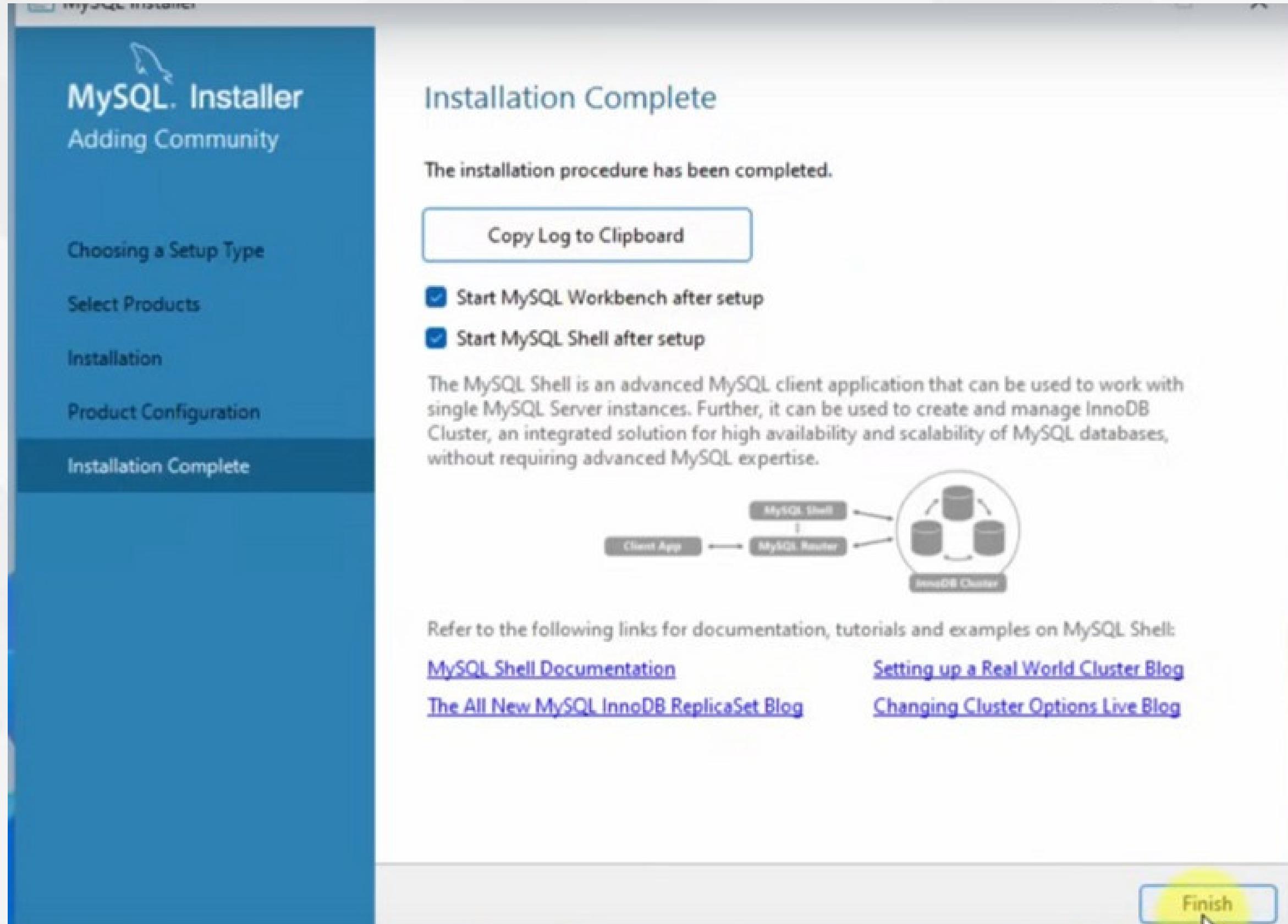
click “Execute”



click “finish”



click “Next”



click “Finish”

STEP3: now let set up the path

- a) Go to C drive
- b) Go to program files
- c) Click mySQL
- d) click mySQL server
- e) Click on bin
- f) copy the path
- g) minimize the window

STEP3: now let set up the path

- h) Go to “start” and type “environment variable”
- i) click “environment variable”
- j) under system variable click “path”
- k) click “new”
- l) Right click and paste the path and click “ok”
- m) Click “ok” on windows that will pop up
- n) open command prompt and type “mysql --version “command and press enter