

# Exercise: Computer Systems and Software – MySQL, Workbench

Problems for exercises and homework for the ["Software Technologies" course @ Software University.](#)

## 1. What is it and why you need it

**MySQL Workbench** is a visual tool for database design, management, and administration, while **MySQL Server** is the actual database management system that stores, manages, and retrieves data. QA engineers need these tools to create, manipulate, and verify databases during testing, ensuring that the application's data-related functionalities work correctly and meet requirements.

## 2. How to install

1. Navigate to the official download site <https://dev.mysql.com/downloads/installer/>. Choose your operating system and click one of the two download buttons. It doesn't if you choose mysql-installer-web-community or mysql-installer-community. They are quite the same. The first one downloads the files needed while installing them, the other pre downloads the files needed and then installs them.

General Availability (GA) Releases Archives ⓘ

### MySQL Installer 8.0.32

Select Operating System:  
Microsoft Windows

Looking for previous GA versions?

Windows (x86, 32-bit), MSI Installer (mysql-installer-web-community-8.0.32.0.msi)	8.0.32	2.4M	<a href="#">Download</a>
Windows (x86, 32-bit), MSI Installer (mysql-installer-community-8.0.32.0.msi)	8.0.32	437.3M	<a href="#">Download</a>

MD5: 0f882590f8338adc614e9dc5cb00ca0b | Signature

MD5: a29b5817cba2c7bc0e0b97e897c2591f | Signature

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

2. On the next page you will be prompted to Login or Sign up. Just skip this step.

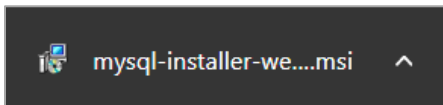
[Login »](#)  
using my Oracle Web account

[Sign Up »](#)  
for an Oracle Web account

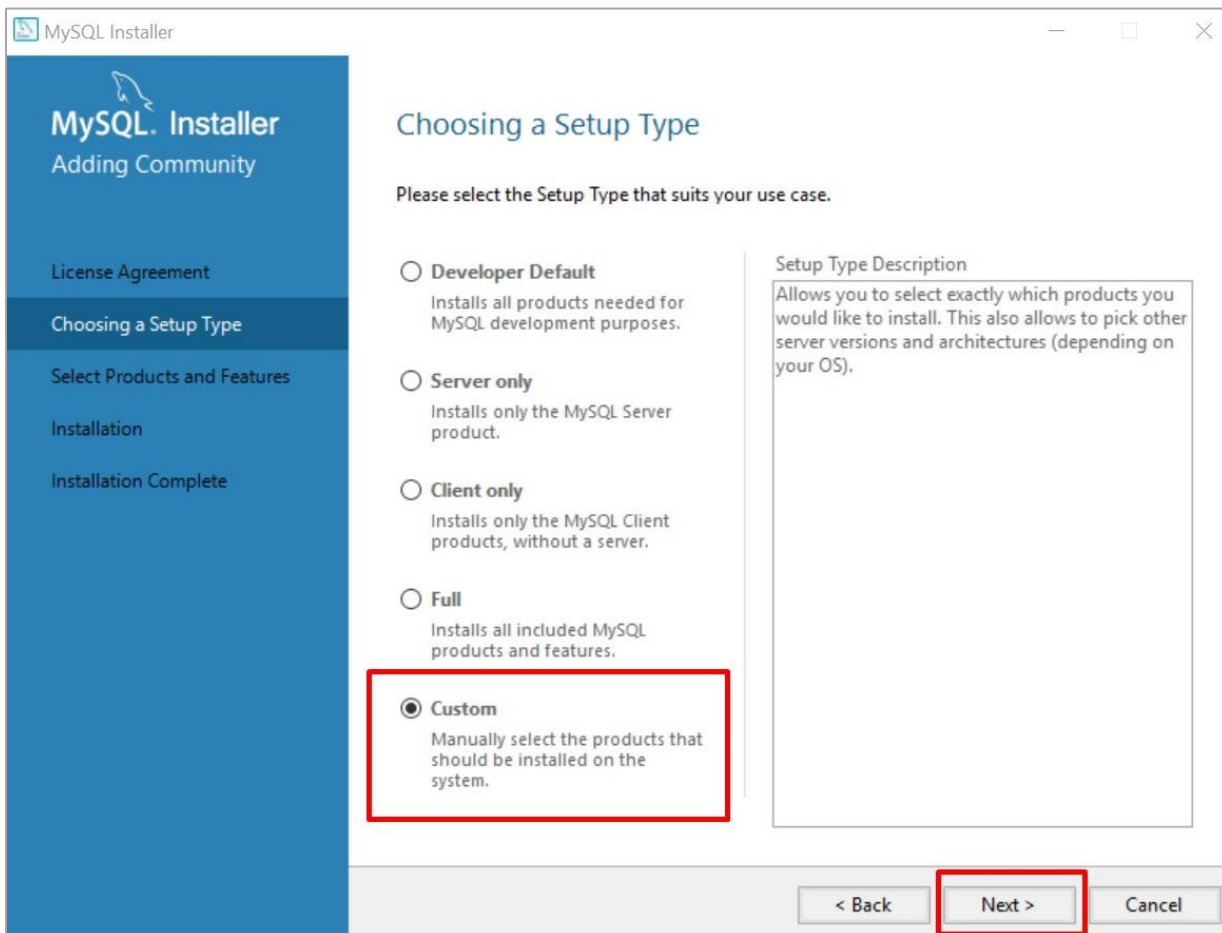
MySQL.com is using Oracle SSO for authentication. If you already have an Oracle Web account, click the Login link. Otherwise, you can signup for a free account by clicking the Sign Up link and following the instructions.

[No thanks, just start my download.](#)

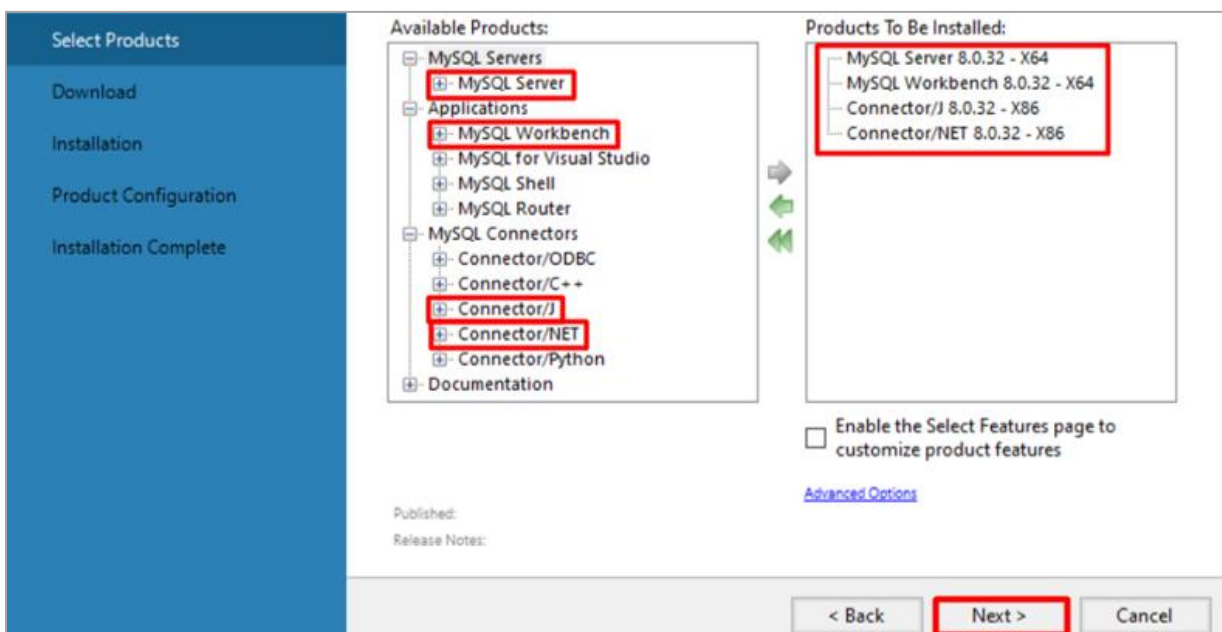
The .msi file will be downloaded to your browser.



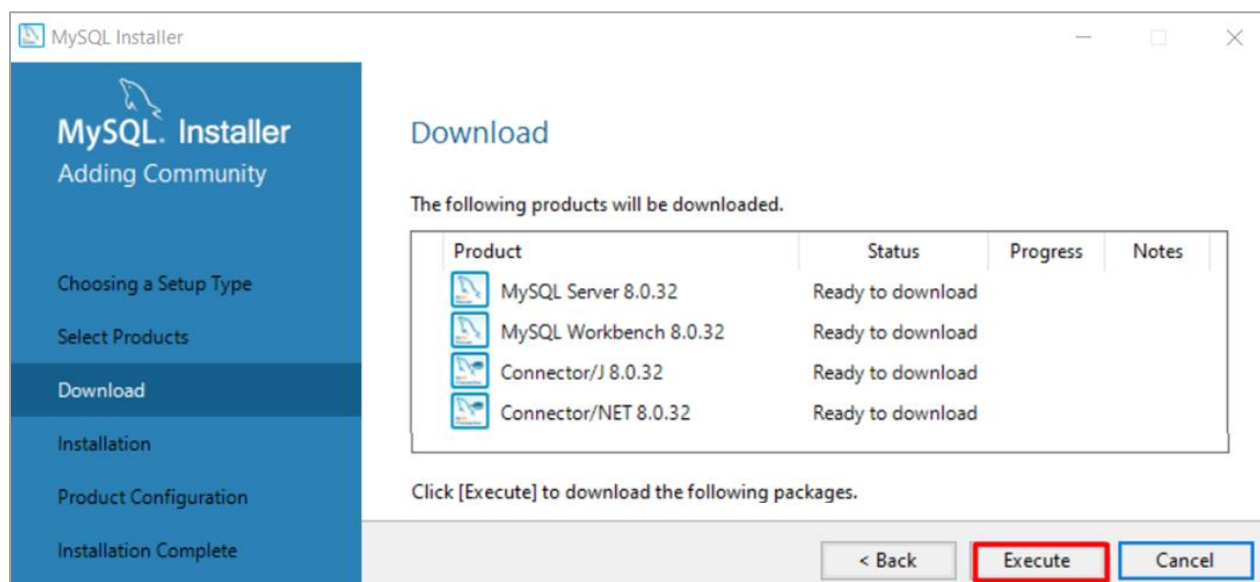
3. Open installation file and choose **Setup type** to be **Custom**. Then click **Next**.



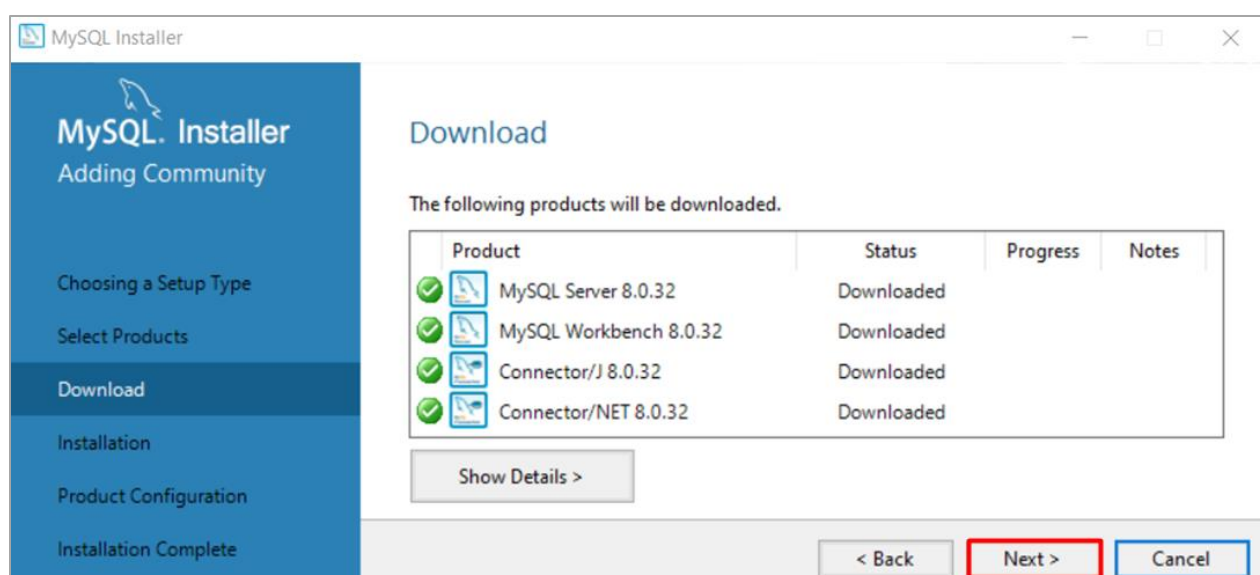
4. All the features we need are **MySQL Server**, **MySQL Workbench**, **Connector/J**, **Connector/NET** and **MySQL Workbench**. All other features are optional and won't be needed for now.



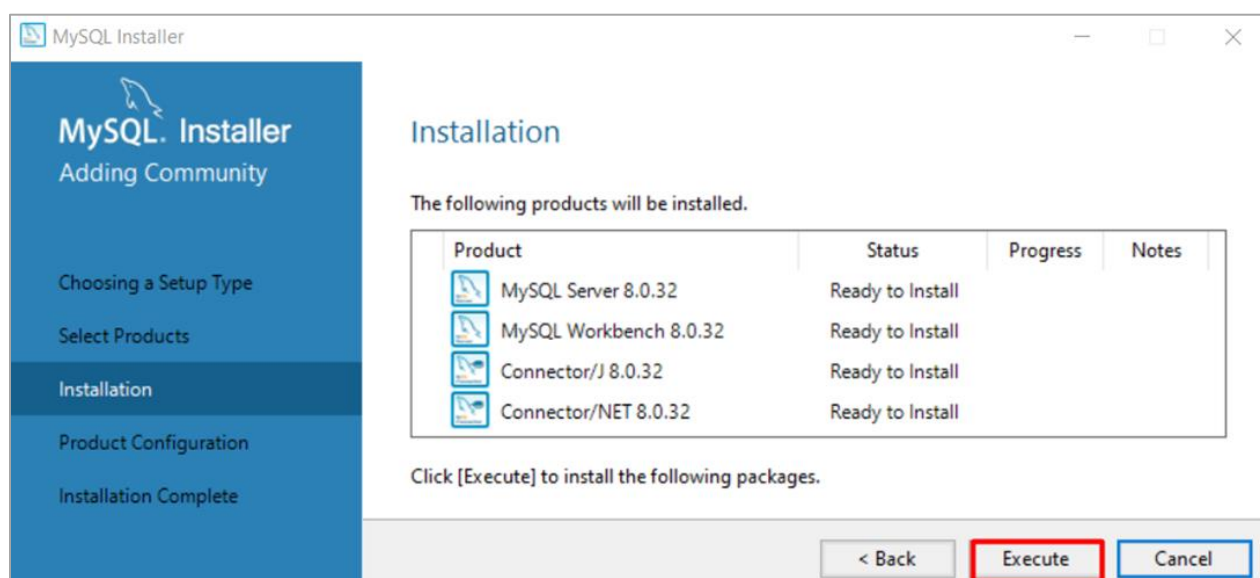
5. Click **Execute** and the setup will download the selected features.



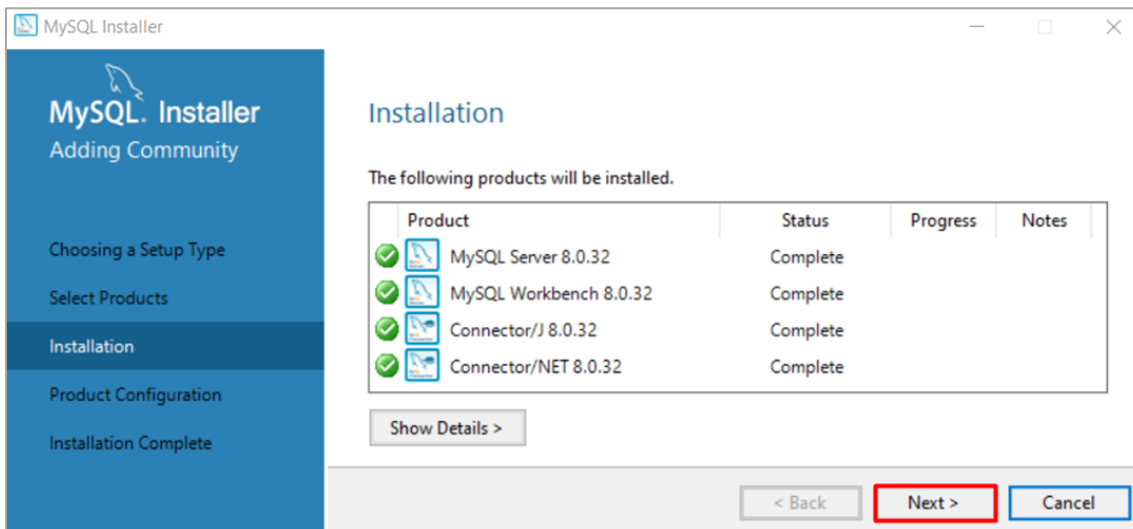
6. Wait for the downloads to complete. Click **Next**



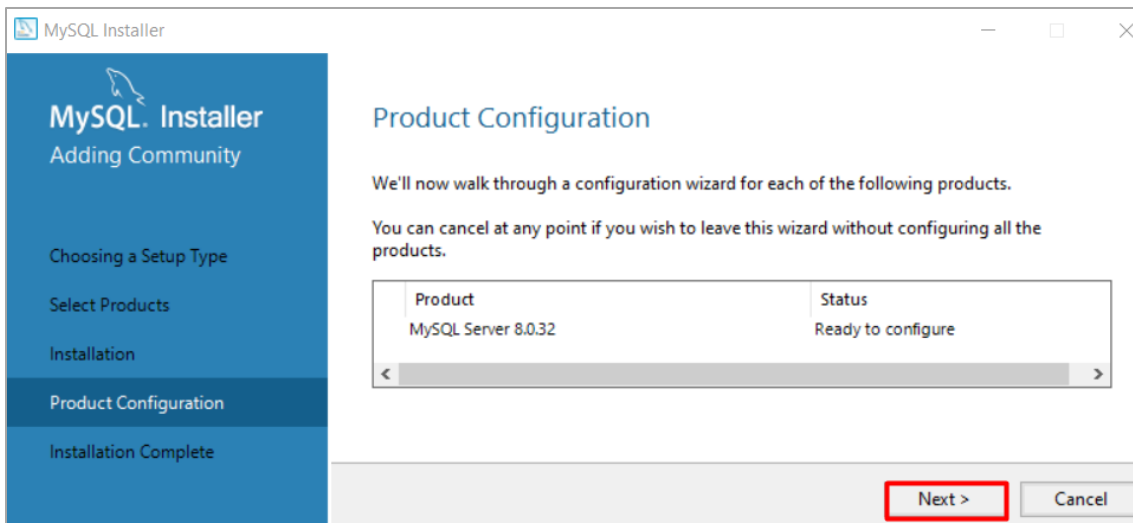
7. Click **Execute** to install the files.



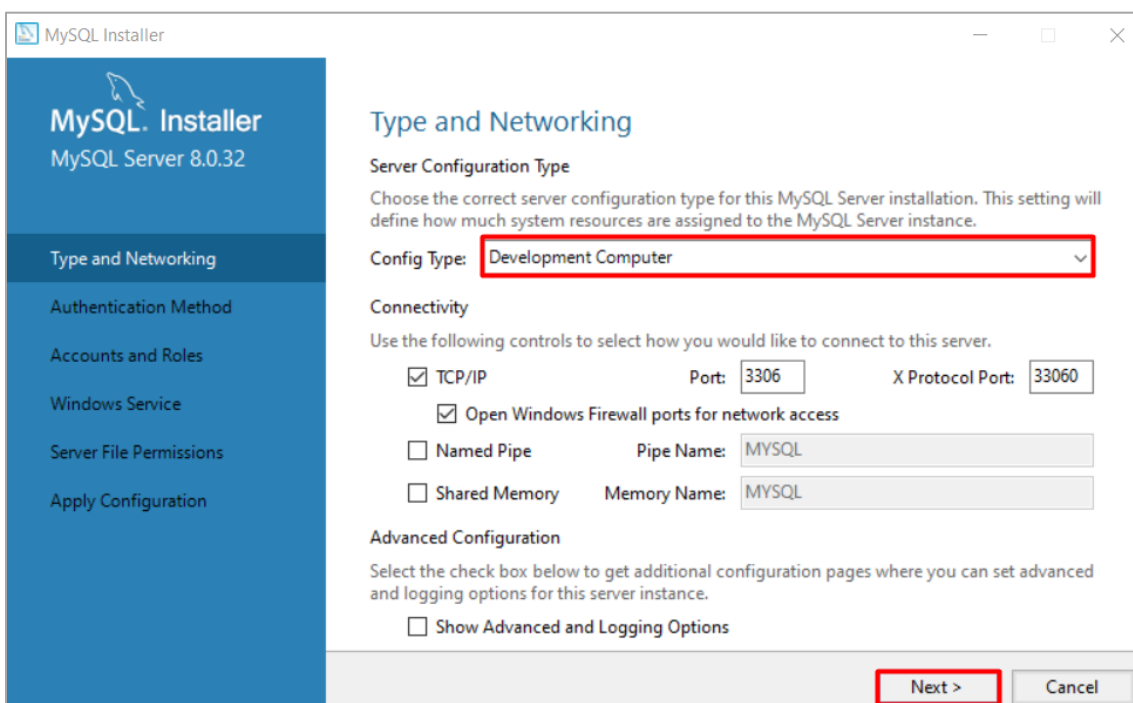
8. Wait for the installation to complete and click **Next** to start configuration wizard.



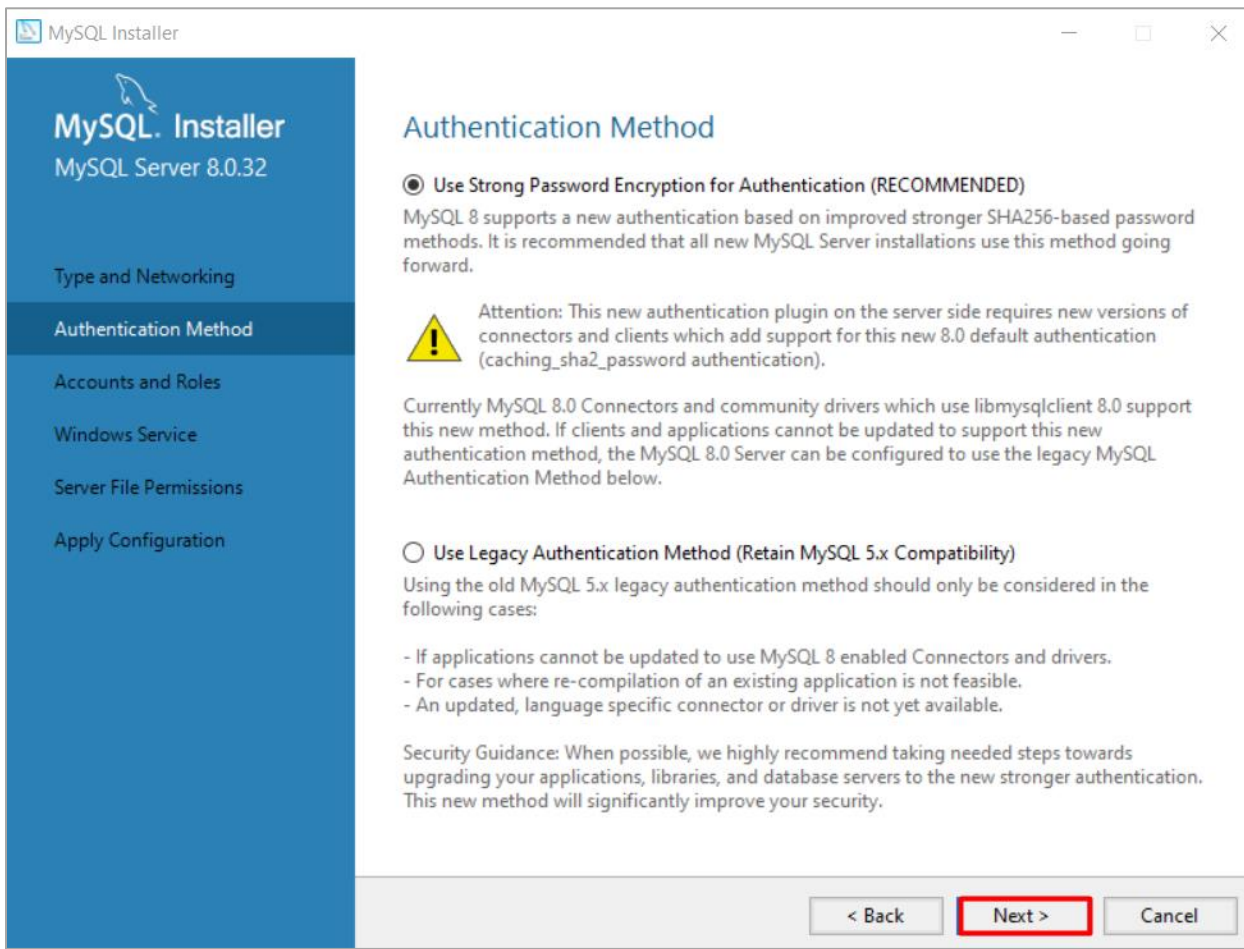
8. Now, you have to configure your product. Click Next.



9. Choose the configuration type to be a **Development Computer** and click on Next.



**10. Choose Authentication method** and click Next.



The screenshot shows the 'Authentication Method' screen in the MySQL Installer. On the left is a blue sidebar with the MySQL logo and 'MySQL Server 8.0.32'. Below the logo are navigation links: 'Type and Networking', 'Authentication Method' (highlighted), '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. It includes a warning icon and text explaining that MySQL 8 supports a new authentication method based on improved stronger SHA256-based password methods, and that it is recommended for all new installations. A second option, 'Use Legacy Authentication Method (Retain MySQL 5.x Compatibility)', is unselected and includes text about using the old method only in specific cases. At the bottom right are three buttons: '< Back', 'Next >' (highlighted with a red box), and 'Cancel'.


MySQL Installer  
MySQL Server 8.0.32

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)**

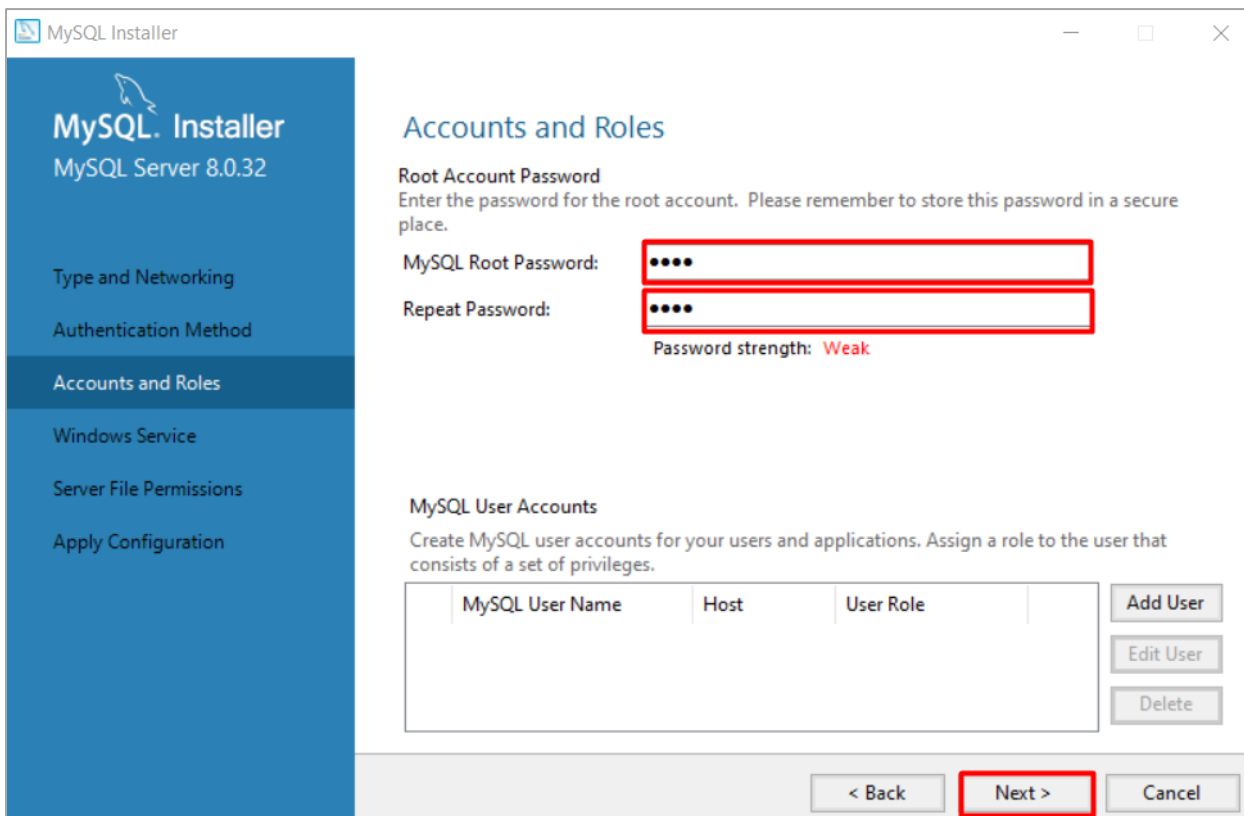
Using the old MySQL 5.x legacy authentication method should only be considered in the following cases:

- 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

**11. Set password** to the Root account and click Next.



The screenshot shows the 'Accounts and Roles' screen in the MySQL Installer. The left sidebar is the same as in the previous screen, with 'Accounts and Roles' highlighted. The main area is titled 'Accounts and Roles' and contains a section for 'Root Account Password'. It prompts the user to enter the password for the root account and remember to store it in a secure place. There are two input fields: 'MySQL Root Password:' and 'Repeat Password:', both containing four dots and highlighted with red boxes. Below these fields, the 'Password strength' is indicated as 'Weak'. At the bottom, there is a section for 'MySQL User Accounts' with a table to create new users. The table has columns for 'MySQL User Name', 'Host', and 'User Role'. To the right of the table are buttons for 'Add User', 'Edit User', and 'Delete'. At the bottom right are three buttons: '< Back', 'Next >' (highlighted with a red box), and 'Cancel'.

MySQL Installer  
MySQL Server 8.0.32

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



12. Here you can set the **MySQL Server to run as Windows Service and to start automatically at Windows start up**. Otherwise, **you must start up MySQL every time before working with a database**. Decide whichever suits you best.

The screenshot shows the 'MySQL Installer' window for 'MySQL Server 8.0.32'. The left sidebar lists the installation steps: Type and Networking, Authentication Method, Accounts and Roles, Windows Service (highlighted), Server File Permissions, and Apply Configuration. The main area is titled 'Windows Service' and contains the following options:

- ☒ **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** (highlighted with a red box)
- 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.

At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a red box), and 'Cancel'.

13. **Server File Permission** – Leave the chosen option as it as it is. Next.

The screenshot shows the 'MySQL Installer' window for 'MySQL Server 8.0.32'. The left sidebar lists the installation steps: Type and Networking, Authentication Method, Accounts and Roles, Windows Service, Server File Permissions (highlighted), and Apply Configuration. The main area is titled 'Server File Permissions' and contains the following options:

- 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.

At the bottom, there are three buttons: '< Back', 'Next >' (highlighted with a red box), and 'Cancel'.

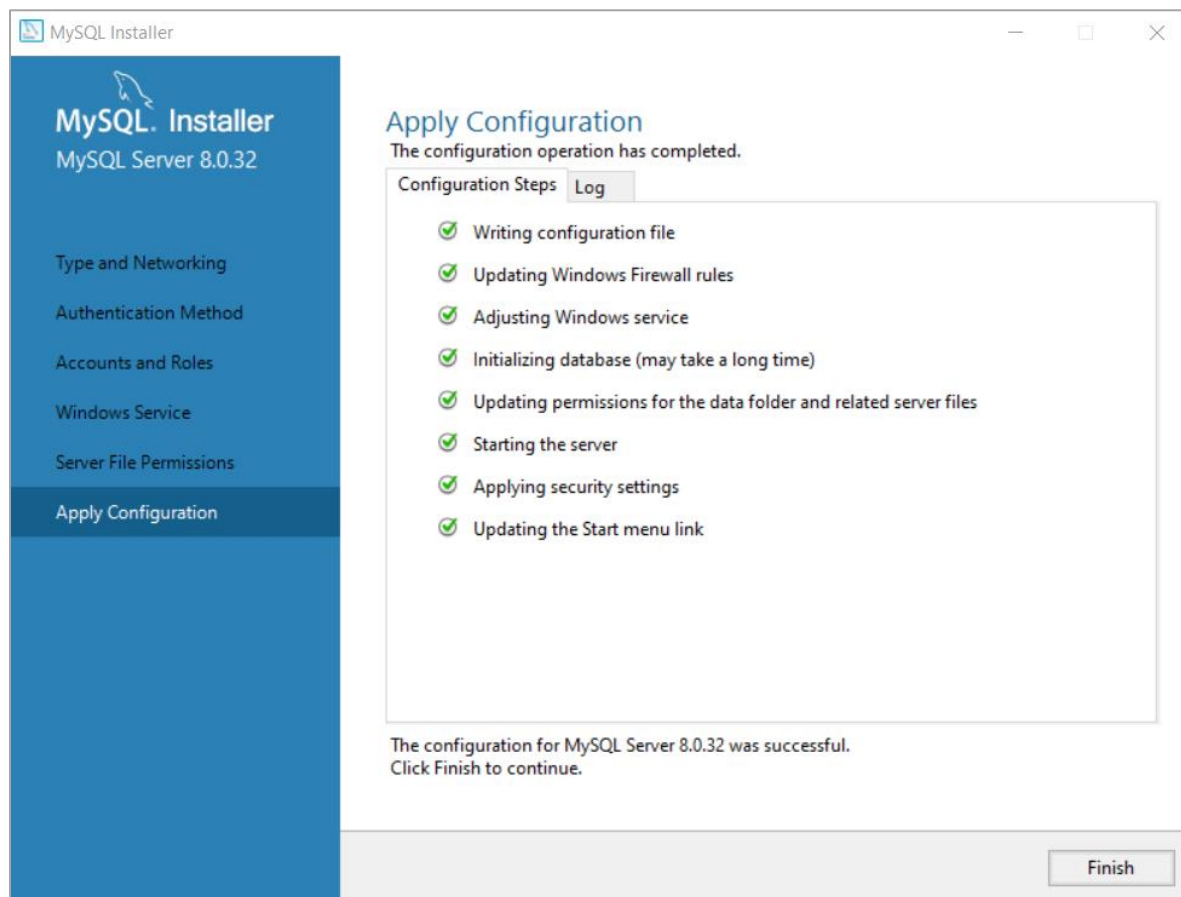
14. Hit **Execute** and wait for the **Configuration to be applied**.

The screenshot shows the 'MySQL Installer' window for 'MySQL Server 8.0.32'. The left sidebar lists the installation steps: Type and Networking, Authentication Method, Accounts and Roles, Windows Service, Server File Permissions, and Apply Configuration (highlighted). The main area is titled 'Apply Configuration' and contains the following options:

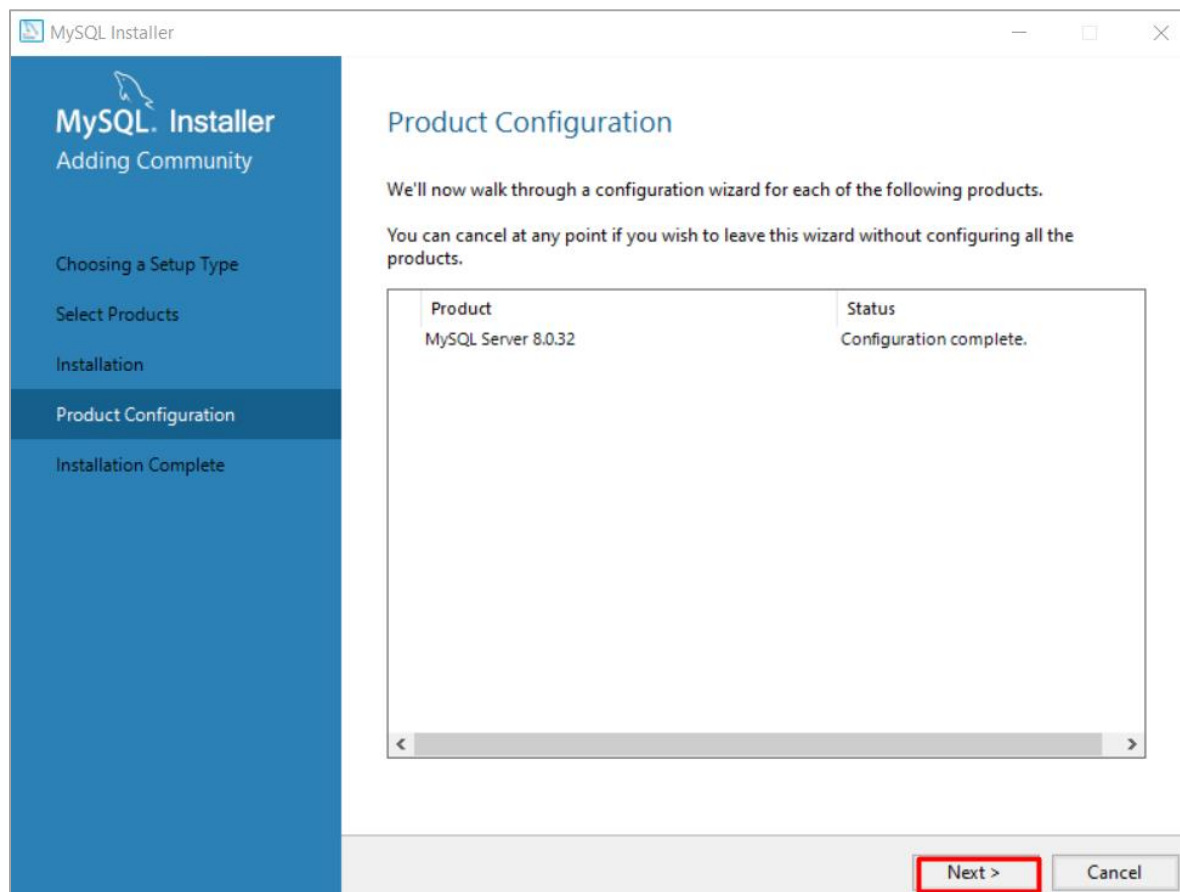
- Click [Execute] to apply the changes
- Configuration Steps** (Log)
- ☐ Writing configuration file
  - ☐ Updating Windows Firewall rules
  - ☐ Adjusting Windows service
  - ☐ Initializing database (may take a long time)
  - ☐ Updating permissions for the data folder and related server files
  - ☐ Starting the server
  - ☐ Applying security settings
  - ☐ Updating the Start menu link

At the bottom, there are three buttons: '< Back', 'Execute' (highlighted with a red box), and 'Cancel'.

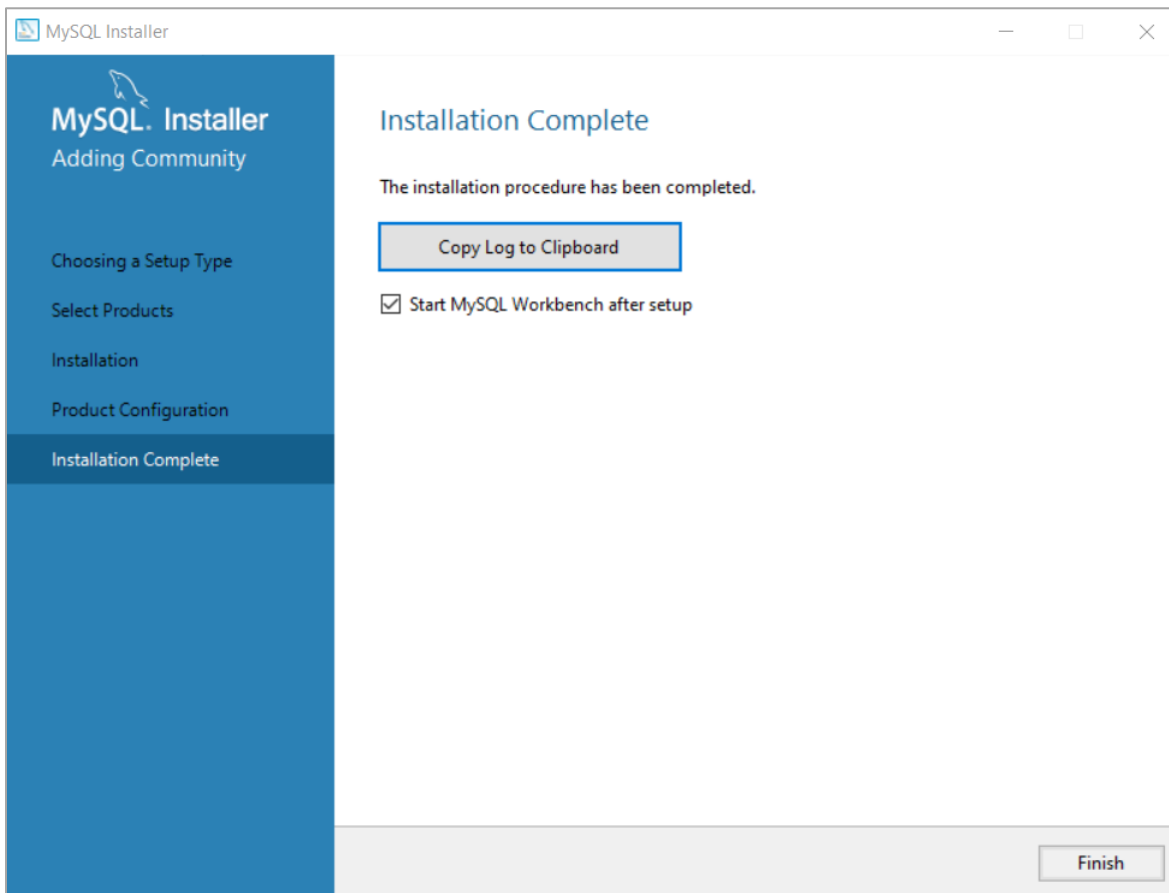
15. Click **Finish**.



16. Another **Next**. 😊

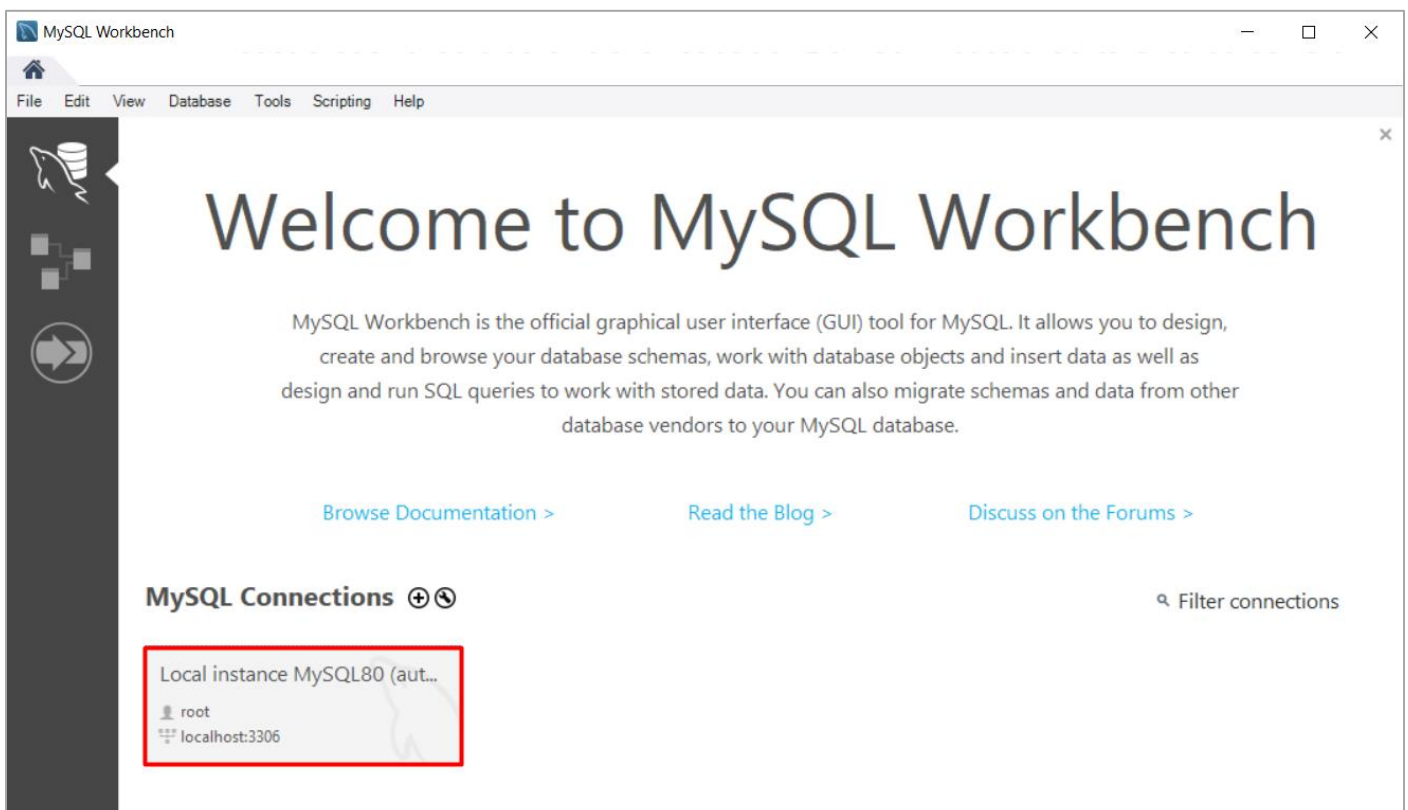


## 17. And one final **Finish**.



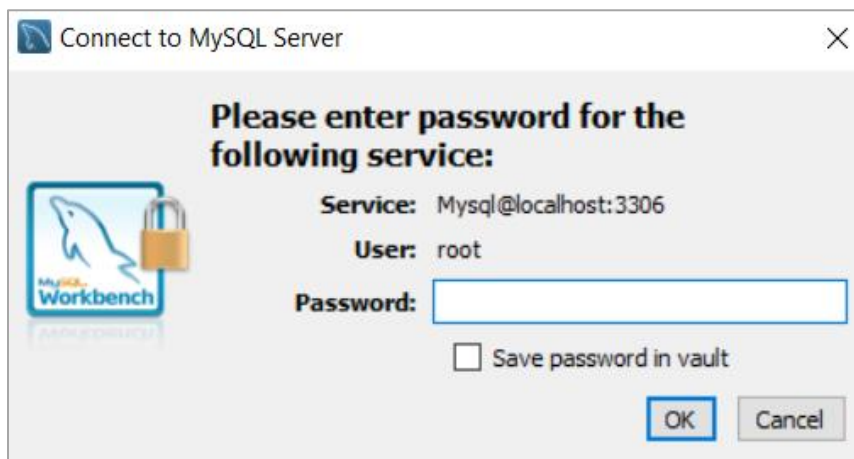
## 3. Simple Database and queries

### 1. Open Workbench and connect to the local server.

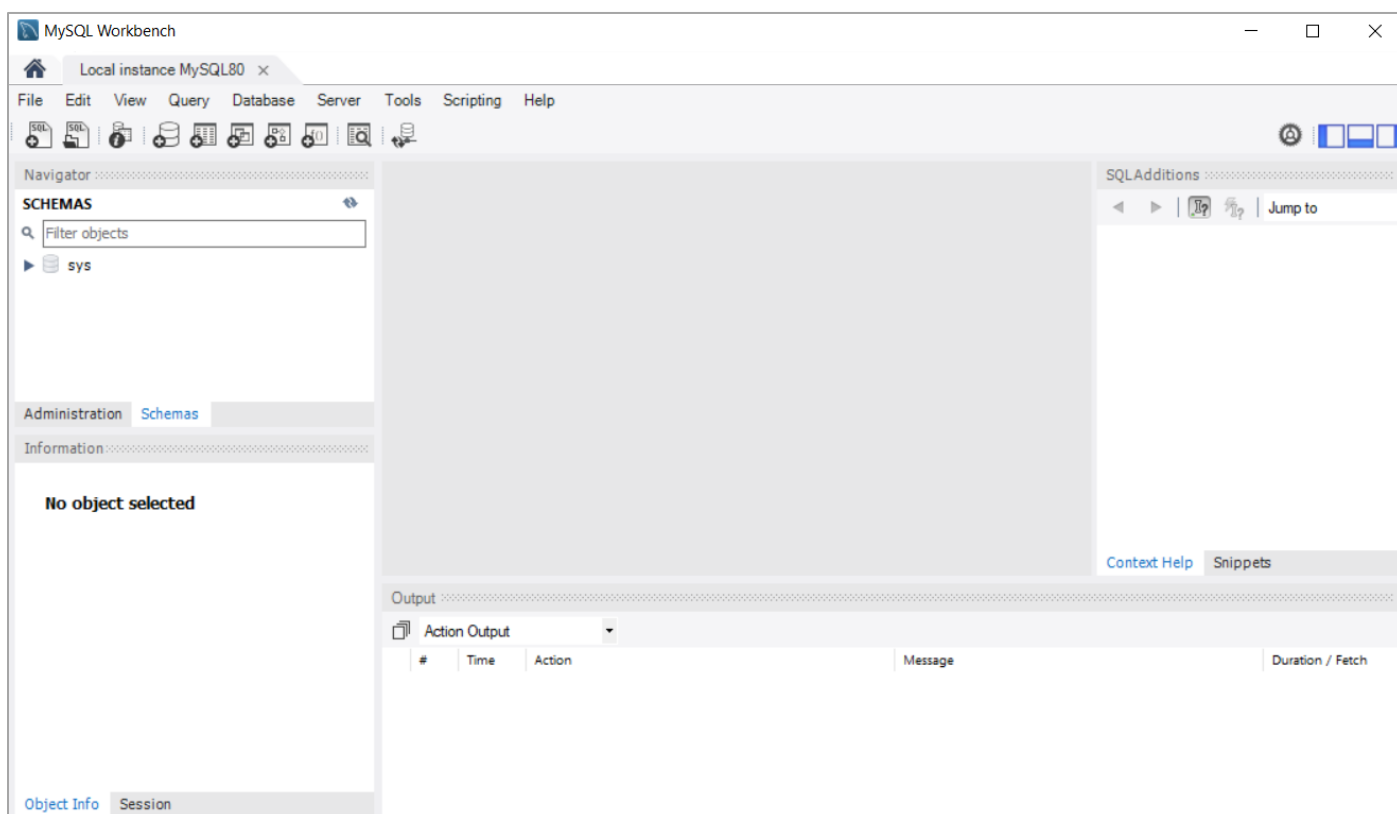




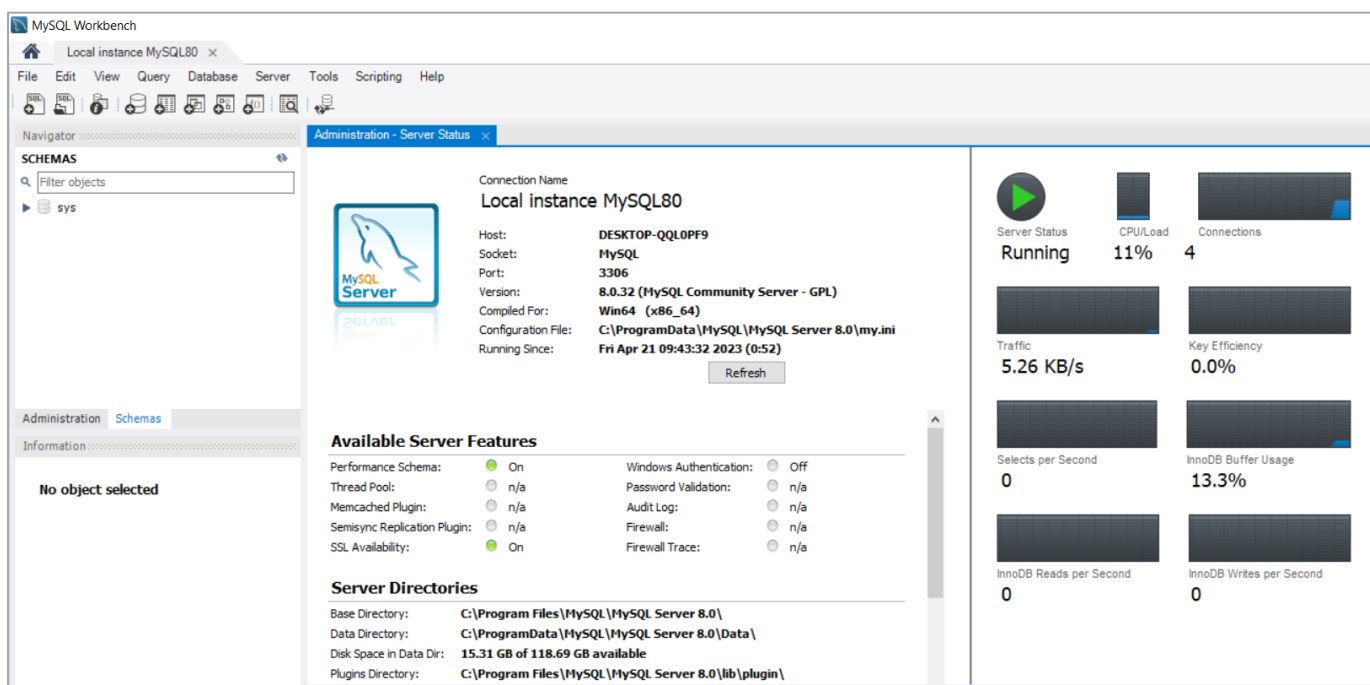
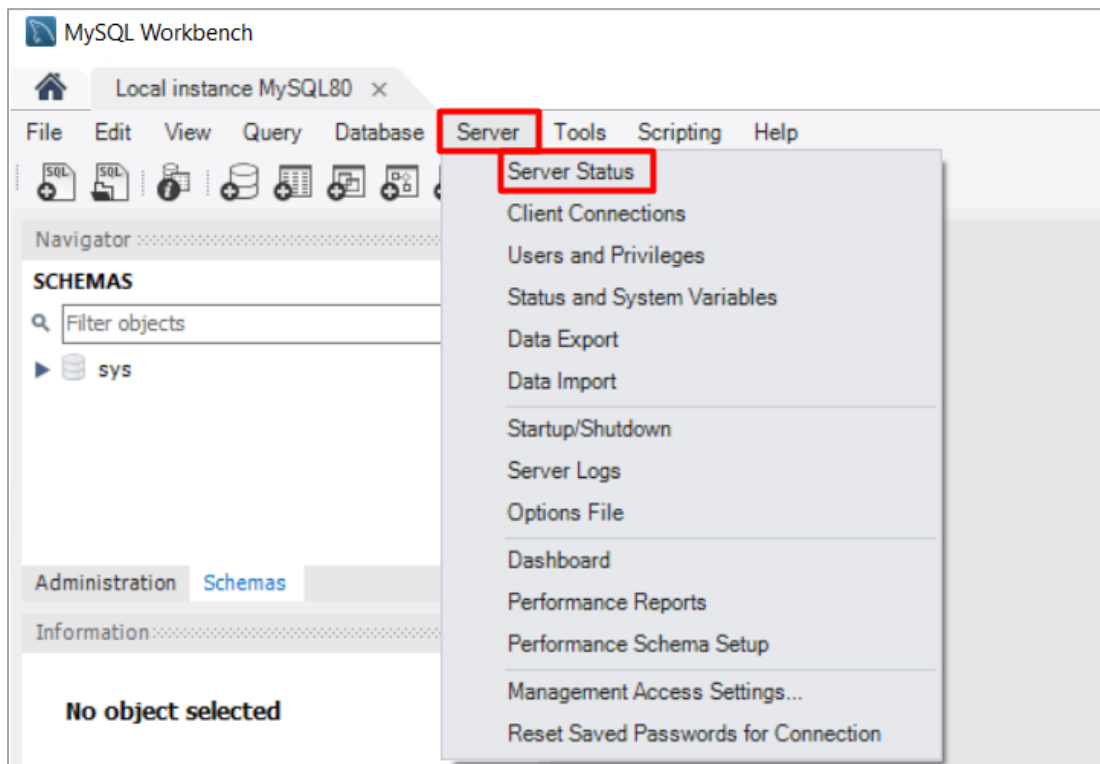
2. Enter the **password** you previously created.



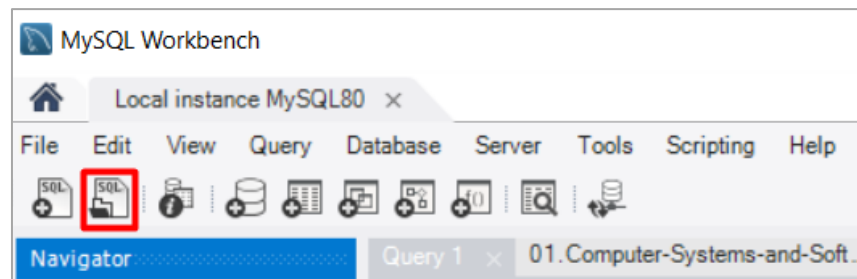
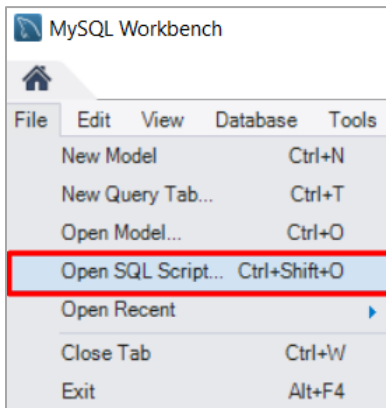
3. This is how **Workbench** looks like.



4. You can check the **status of your server** if you'd like.



5. Now, we will open an existing SQL script, which will create a simple database, containing just one table and populate it with records. You are provided with the file "**01.Computer-Systems-and-Software-Exercise-MySQL-Database.sql**". You can open it in two ways:



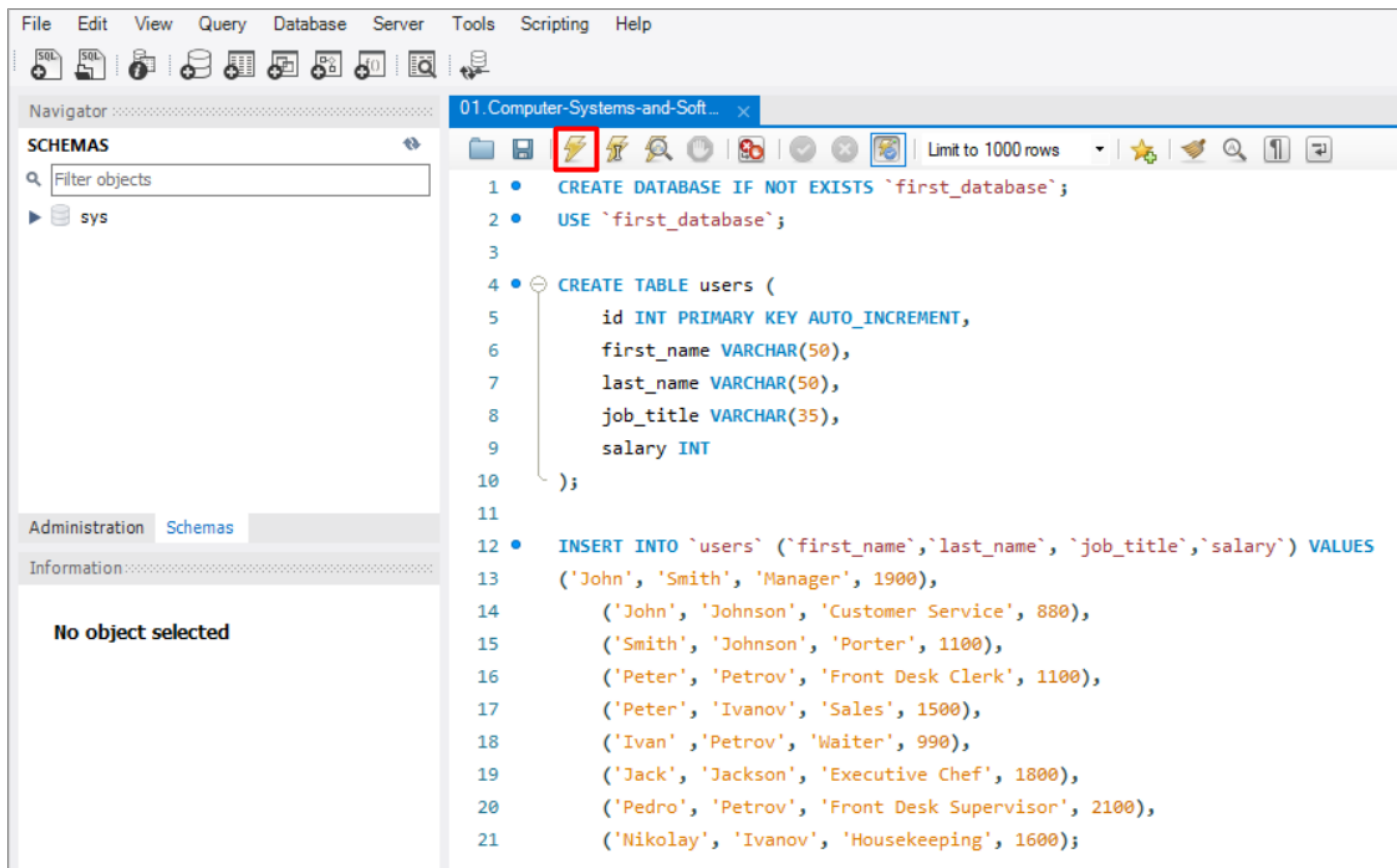
6. This is how the file **would look like** when you open it.

```

01. Computer-Systems-and-Soft... x
Limit to 1000 rows
1 • CREATE DATABASE IF NOT EXISTS `first_database`;
2 • USE `first_database`;
3
4 • CREATE TABLE users (
5     id INT PRIMARY KEY AUTO_INCREMENT,
6     first_name VARCHAR(50),
7     last_name VARCHAR(50),
8     job_title VARCHAR(35),
9     salary INT
10 );
11
12 • INSERT INTO `users` (`first_name`, `last_name`, `job_title`, `salary`) VALUES
13     ('John', 'Smith', 'Manager', 1900),
14     ('John', 'Johnson', 'Customer Service', 880),
15     ('Smith', 'Johnson', 'Porter', 1100),
16     ('Peter', 'Petrov', 'Front Desk Clerk', 1100),
17     ('Peter', 'Ivanov', 'Sales', 1500),
18     ('Ivan', 'Petrov', 'Waiter', 990),
19     ('Jack', 'Jackson', 'Executive Chef', 1800),
20     ('Pedro', 'Petrov', 'Front Desk Supervisor', 2100),
21     ('Nikolay', 'Ivanov', 'Housekeeping', 1600);
  
```

7. As you can see SQL is very logical and user friendly. The given script will create a database called "first\_database" (if such database doesn't already exist), then it will use the database to create a table "users" in it. Each user will have an id, first\_name, last\_name, job\_title and salary fields. After creating the table, it will populate it with values.

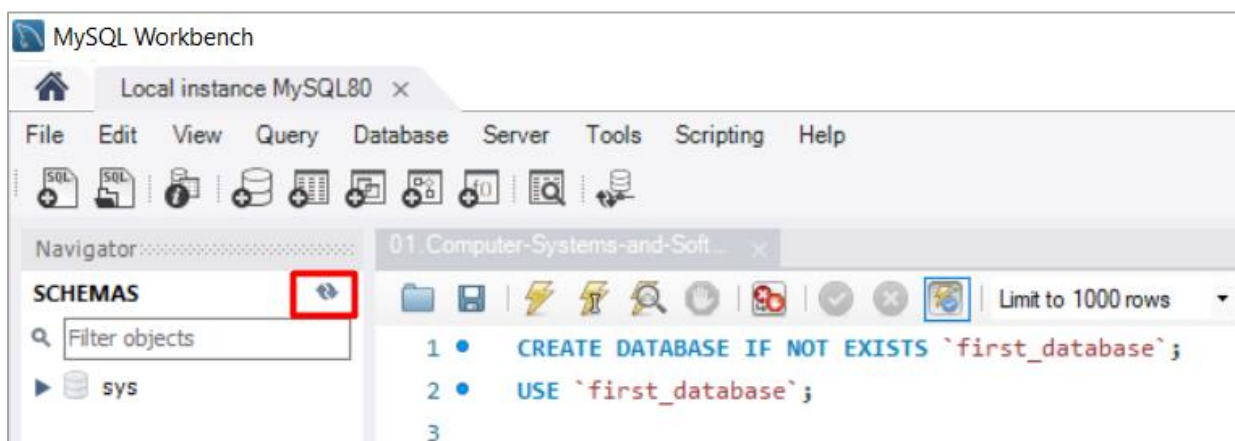
In order to **run the script**, hit the **yellow bolt button**.



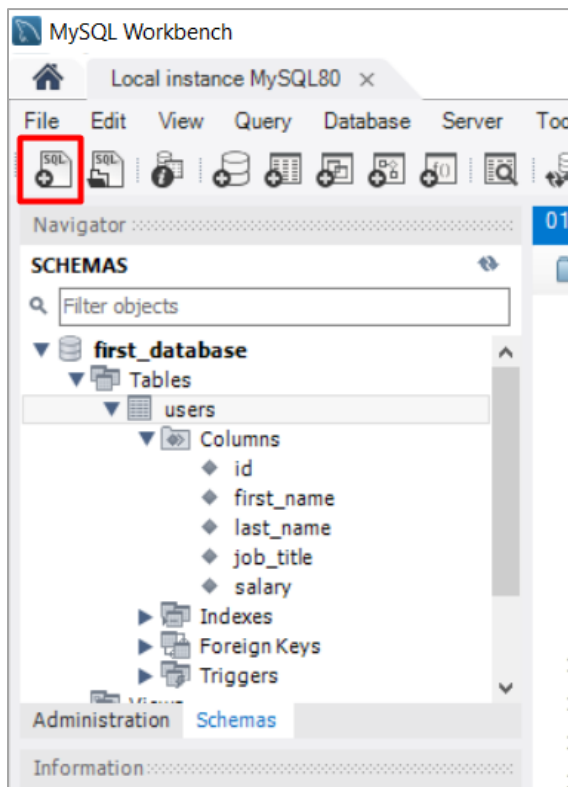
8. In the output section you should see the **commands executed**.

Output				
Action Output				
#	Time	Action	Message	
✓ 1	09:55:52	CREATE DATABASE IF NOT EXISTS `first_database`	1 row(s) affected	
✓ 2	09:55:52	USE `first_database`	0 row(s) affected	
✓ 3	09:55:52	CREATE TABLE users (id INT PRIMARY KEY AUTO_INCREMENT, first_name VARCHAR(50), last_name VARC...	0 row(s) affected	
✓ 4	09:55:52	INSERT INTO `users` (`first_name`,`last_name`,`job_title`,`salary`) VALUES ('John', 'Smith', 'Manager', 1900), ('John', '...	9 row(s) affected Records: 9 Duplicates: 0 Warnings: 0	

9. Hit the refresh button to **see the newly created database**.



10. As you can see, the database was created with all its attributes. Now, let's see how it looks like and write a few queries. **Click on the "Create a new SQL tab..." button.**



11. Now, we will **select all the records** from "users" table. Write the following query:

**SELECT \* FROM users;**

Now hit the other bolt button, which has something like an "I" sing on it.

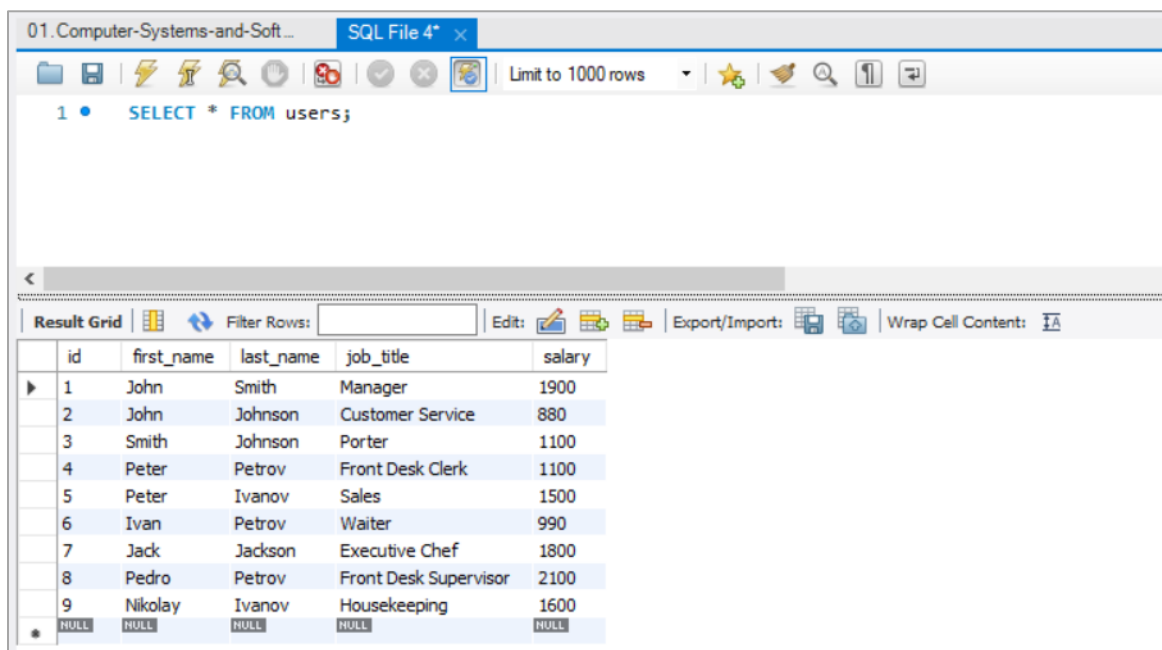
**Note:** The difference between those two buttons is, as follows:



- Executes the selected portion of the script or everything, if there's no selection



- Executes the statement under the keyboard cursor



12. Now, that we know how all records looks like, let's execute a second **query**, which will select all records, where **salary is equal or more than 1500**.



```
2  
3 • SELECT * FROM users WHERE salary >=1500;  
4
```

### 13. Try a few queries by yourself.

- Try to select all with last name "Petrov".
- Try to select all with first name "Peter".
- Try to select all with salary below 1800.