



# BASI DI DATI

## MySQL: Installazione e uso base

# Outline

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- Cos'è MySQL
  - Download e Installazione
  - Configurazione
  - MySQL Workbench
  - Un caso di studio: database di un'università
    - Creazione di un database
    - Creazione di tabelle
    - Definizione dei vincoli di integrità referenziale
    - Inserimento e modifica dei dati
-

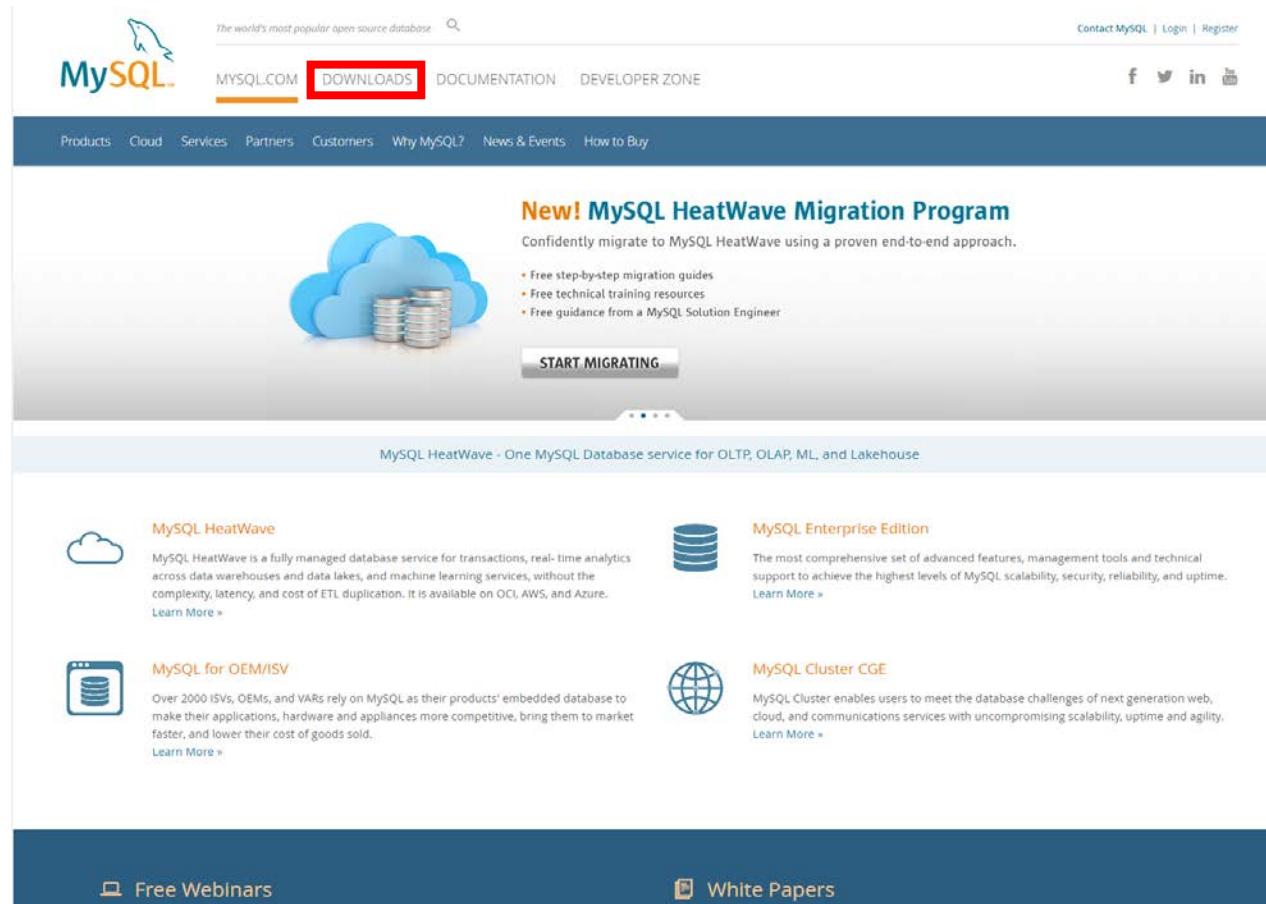
# MySQL

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- MySQL è un Database Management System (DBMS) Relazionale
  - È uno dei DBMS più utilizzati al mondo perché:
    - È open source, ed è gratuito;
    - È disponibile su molti sistemi operativi;
    - È relativamente leggero;
    - È semplice da amministrare;
    - È molto performante, non è un DBMS giocattolo
  - Supporta transazioni ACID, Stored Procedure, Viste, Trigger, Transazioni distribuite, DBMS Federati...
-

# Download e Installazione

- È attualmente disponibile gratuitamente
  - <https://www.mysql.com>



The screenshot shows the MySQL website homepage. At the top, the MySQL logo is on the left, followed by the tagline "The world's most popular open source database" and a search icon. To the right are links for "Contact MySQL", "Login", and "Register". Below this is a navigation bar with links for "MYSQL.COM", "DOWNLOADS" (highlighted with a red box), "DOCUMENTATION", and "DEVELOPER ZONE". Social media icons for Facebook, Twitter, LinkedIn, and YouTube are also present. A secondary navigation bar lists "Products", "Cloud", "Services", "Partners", "Customers", "Why MySQL?", "News & Events", and "How to Buy". The main content area features a large banner for the "New! MySQL HeatWave Migration Program" with a cloud and server icon, a description, three bullet points, and a "START MIGRATING" button. Below the banner is a section titled "MySQL HeatWave - One MySQL Database service for OLTP, OLAP, ML, and Lakehouse". This section contains four cards: "MySQL HeatWave" (cloud icon), "MySQL Enterprise Edition" (server icon), "MySQL for OEM/ISV" (server icon), and "MySQL Cluster CGE" (globe icon). Each card includes a brief description and a "Learn More" link. At the bottom, there are two buttons: "Free Webinars" and "White Papers".

The world's most popular open source database

MySQL.COM DOWNLOADS DOCUMENTATION DEVELOPER ZONE

Contact MySQL | Login | Register

Products Cloud Services Partners Customers Why MySQL? News & Events How to Buy

### New! MySQL HeatWave Migration Program

Confidently migrate to MySQL HeatWave using a proven end-to-end approach.

- Free step-by-step migration guides
- Free technical training resources
- Free guidance from a MySQL Solution Engineer

START MIGRATING

MySQL HeatWave - One MySQL Database service for OLTP, OLAP, ML, and Lakehouse

#### MySQL HeatWave

MySQL HeatWave is a fully managed database service for transactions, real-time analytics across data warehouses and data lakes, and machine learning services, without the complexity, latency, and cost of ETL duplication. It is available on OCI, AWS, and Azure.

[Learn More »](#)

#### MySQL Enterprise Edition

The most comprehensive set of advanced features, management tools and technical support to achieve the highest levels of MySQL scalability, security, reliability, and uptime.

[Learn More »](#)

#### MySQL for OEM/ISV

Over 2000 ISVs, OEMs, and VARs rely on MySQL as their products' embedded database to make their applications, hardware and appliances more competitive, bring them to market faster, and lower their cost of goods sold.

[Learn More »](#)

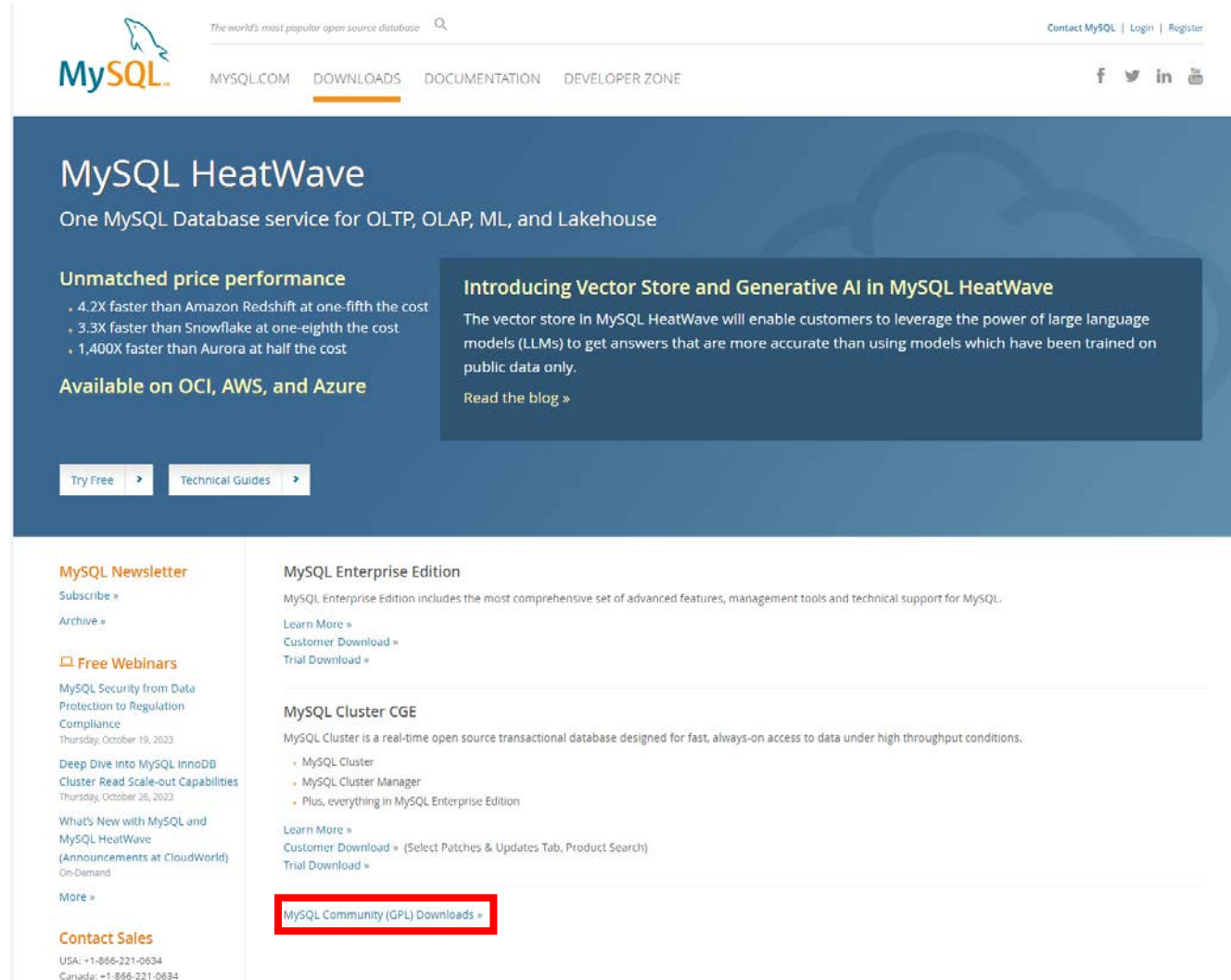
#### MySQL Cluster CGE

MySQL Cluster enables users to meet the database challenges of next generation web, cloud, and communications services with uncompromising scalability, uptime and agility.

[Learn More »](#)

Free Webinars White Papers

# Download e Installazione



The screenshot shows the MySQL website with a teal header bar. The main navigation bar includes the MySQL logo, the tagline "The world's most popular open source database", a search icon, and links for "Contact MySQL", "Login", and "Register". Below this is a secondary navigation bar with "MYSQL.COM", "DOWNLOADS" (highlighted with an orange underline), "DOCUMENTATION", and "DEVELOPER ZONE". Social media icons for Facebook, Twitter, LinkedIn, and YouTube are on the right.

The main content area features a large blue banner for "MySQL HeatWave", described as "One MySQL Database service for OLTP, OLAP, ML, and Lakehouse". It highlights "Unmatched price performance" with three bullet points: "4.2X faster than Amazon Redshift at one-fifth the cost", "3.3X faster than Snowflake at one-eighth the cost", and "1,400X faster than Aurora at half the cost". It also states "Available on OCI, AWS, and Azure". A dark blue box on the right introduces "Vector Store and Generative AI in MySQL HeatWave", explaining that the vector store will enable customers to leverage large language models (LLMs) for more accurate answers than public data only, with a "Read the blog »" link.

Below the banner are two buttons: "Try Free" and "Technical Guides".

The footer section is divided into three columns. The left column contains a "MySQL Newsletter" section with "Subscribe »" and "Archive »" links, followed by a "Free Webinars" section listing three webinars: "MySQL Security from Data Protection to Regulation Compliance" (October 19, 2023), "Deep Dive into MySQL InnoDB Cluster Read Scale-out Capabilities" (October 26, 2023), and "What's New with MySQL and MySQL HeatWave (Announcements at CloudWorld) On-Demand". A "More »" link is at the bottom of this section. The middle column contains a "MySQL Enterprise Edition" section with a description, "Learn More »", "Customer Download »", and "Trial Download »" links. The right column contains a "MySQL Cluster CGE" section with a description, a list of features (MySQL Cluster, MySQL Cluster Manager, and Plus, everything in MySQL Enterprise Edition), "Learn More »", "Customer Download » (Select Patches & Updates Tab, Product Search)", and "Trial Download »" links. At the bottom of the right column, a red box highlights the "MySQL Community (GPL) Downloads »" link.

At the bottom left, there is a "Contact Sales" section with contact information: "USA: +1-866-221-0634" and "Canada: +1-866-221-0634".

# Download e Installazione

## MySQL Community Downloads

- MySQL Yum Repository
- MySQL APT Repository
- MySQL SUSE Repository
- MySQL Community Server
- MySQL Cluster
- MySQL Router
- MySQL Shell
- MySQL Operator
- MySQL NDB Operator
- MySQL Workbench
- MySQL Installer for Windows
- 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

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# Download e Installazione

📌 [MySQL Community Downloads](#)

⏪ MySQL Installer

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

## MySQL Installer 8.0.34

 **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:

8.0.34 ▼

Select Operating System:

Microsoft Windows ▼

<b>Windows (x86, 32-bit), MSI Installer</b> (mysql-installer-web-community-8.0.34.0.msi)	8.0.34	2.4M	<a href="#">Download</a>
<b>Windows (x86, 32-bit), MSI Installer</b> (mysql-installer-community-8.0.34.0.msi)	8.0.34	331.3M	<a href="#">Download</a>

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



# Download e Installazione

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## 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

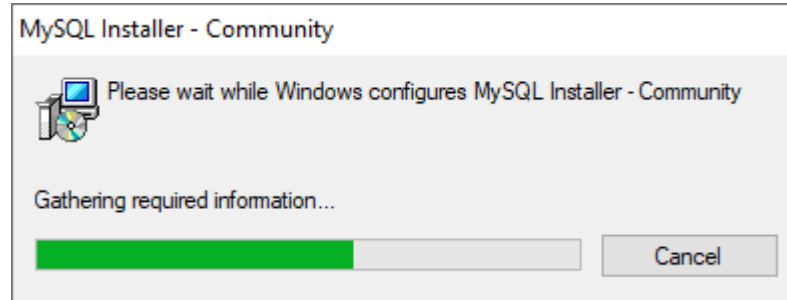
MySQL.com is using Oracle SSO for authentication. If you already have an Oracle Web account, click the Login link. Otherwise, you can signup for a free account by clicking the Sign Up link and following the instructions.

No thanks, just start my download.

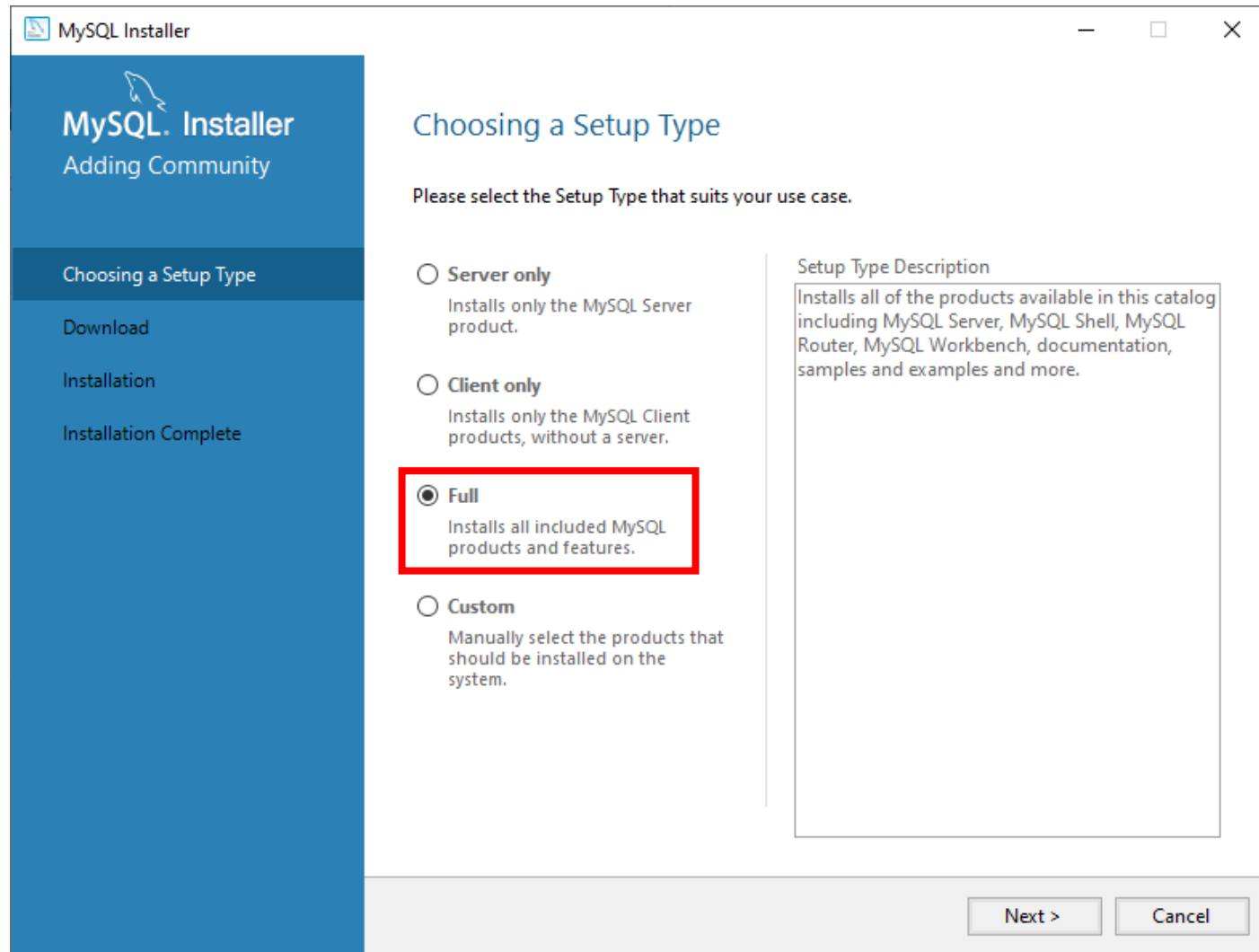
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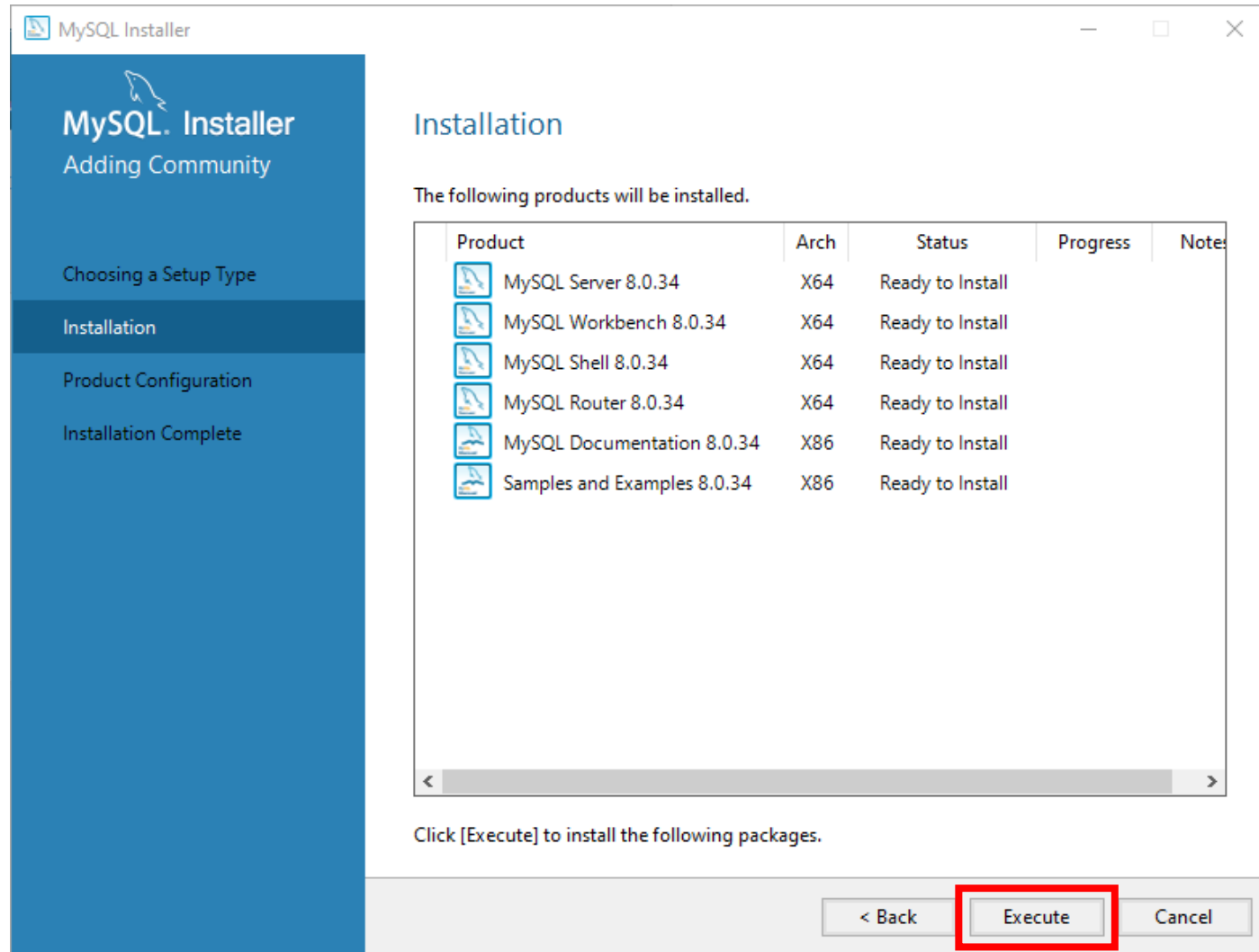
# Download e Installazione



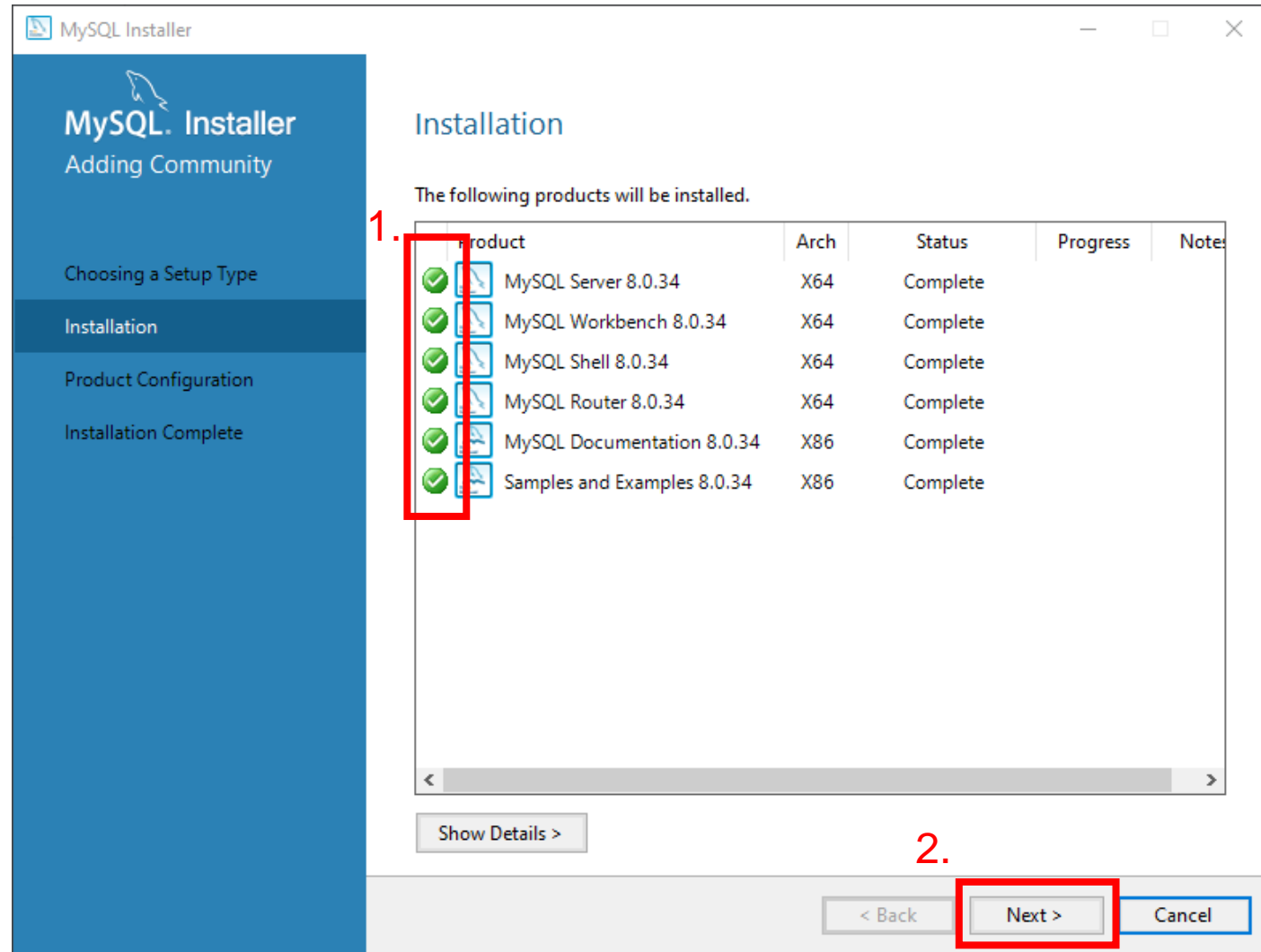
# Download e Installazione



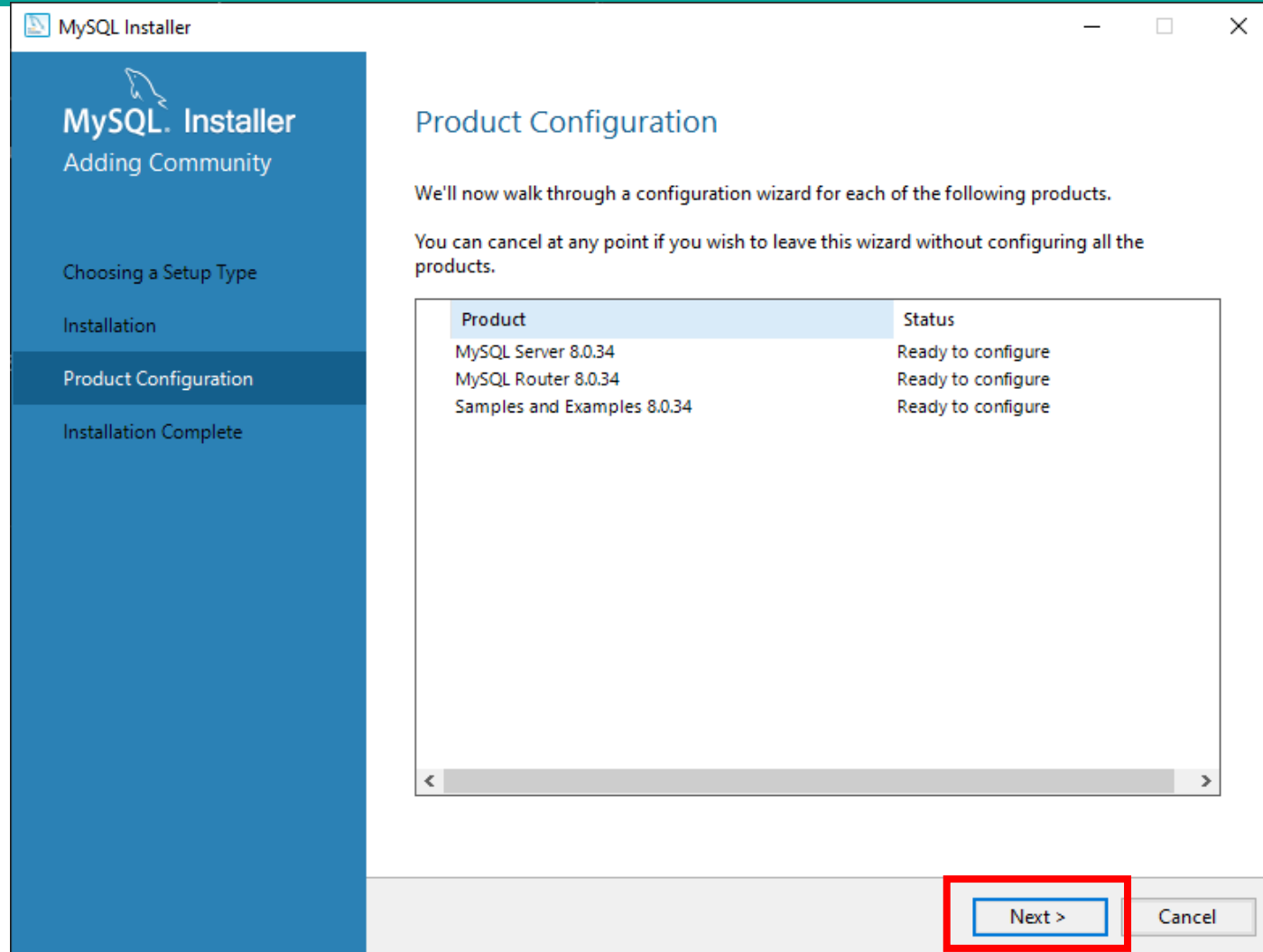
# Download e Installazione



# Download e Installazione



# Configurazione



# Configurazione

MySQL Installer  
MySQL Server 8.0.34

Type and Networking

Authentication Method

Accounts and Roles

Windows Service

Server File Permissions

Logging Options

Advanced Options

Apply Configuration

### Type and Networking

Server Configuration Type

Choose the correct server configuration type for this MySQL Server installation. This setting will define how much system resources are assigned to the MySQL Server instance.

Config Type: Development Computer

Connectivity

Use the following controls to select how you would like to connect to this server.

☒ TCP/IP Port: 3306 X Protocol Port: 33060

☒ Open Windows Firewall ports for network access

☐ Named Pipe Pipe Name: MYSQL

☐ Shared Memory Memory Name: MYSQL

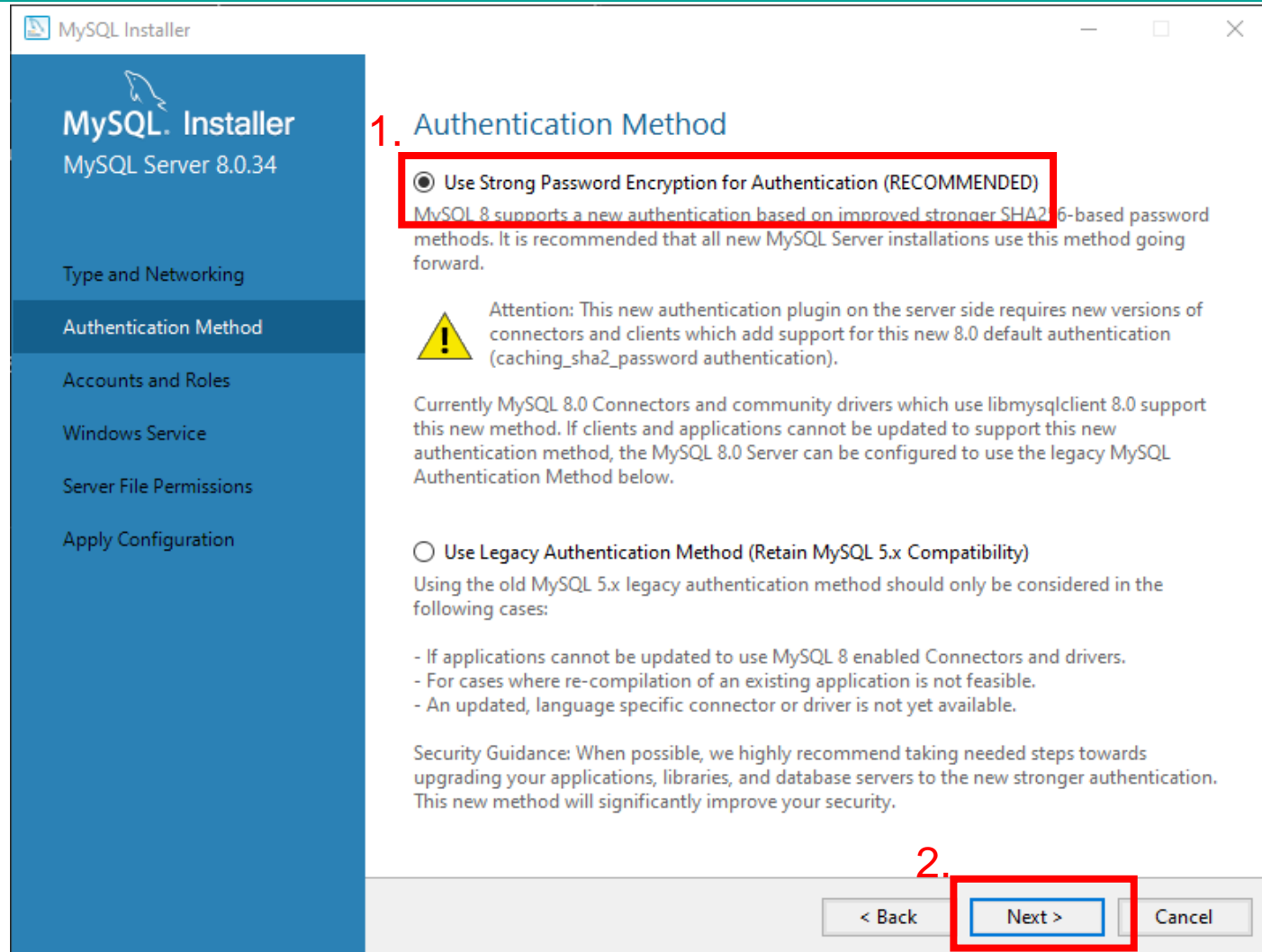
Advanced Configuration

Select the check box below to get additional configuration pages where you can set advanced and logging options for this server instance.

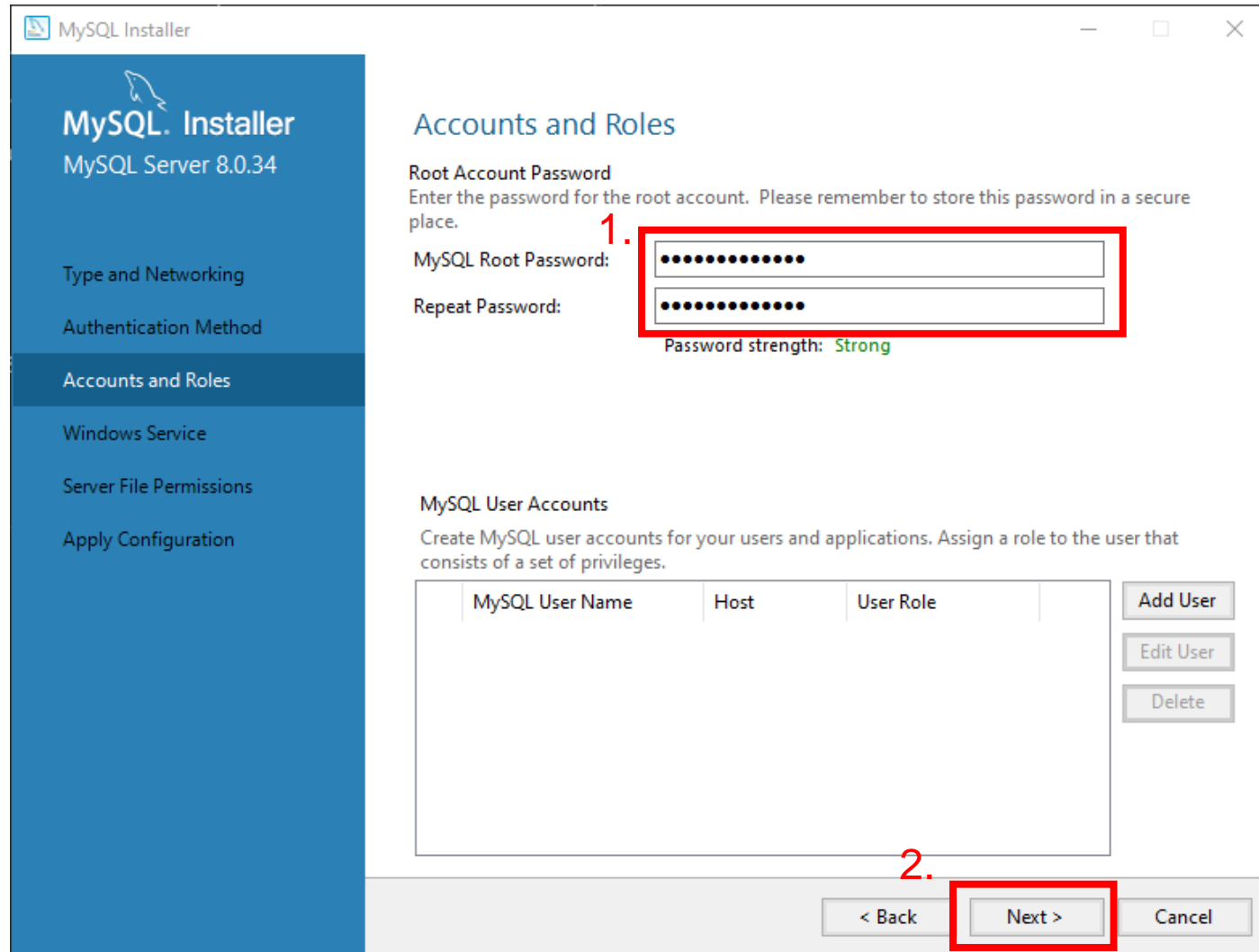
1. ☒ Show Advanced and Logging Options

Next > Cancel

# Configurazione



# Configurazione



The image shows the MySQL Installer window for MySQL Server 8.0.34. The left sidebar contains the following navigation items: MySQL Installer, MySQL Server 8.0.34, Type and Networking, Authentication Method, Accounts and Roles (highlighted), Windows Service, Server File Permissions, and Apply Configuration. The main area is titled 'Accounts and Roles' and contains two sections. The first section, 'Root Account Password', prompts the user to enter a password for the root account. It includes a red '1.' and a red box around the password input fields. The second section, 'MySQL User Accounts', prompts the user to create MySQL user accounts. It includes a table with columns 'MySQL User Name', 'Host', and 'User Role', and buttons for 'Add User', 'Edit User', and 'Delete'. At the bottom, there is a red '2.' and a red box around the 'Next >' button.

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: **Strong**

**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
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Add User  
Edit User  
Delete

< Back **Next >** Cancel



# Configurazione

MySQL Installer  
MySQL Server 8.0.34

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

**1.** Windows Service

☒ 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:

**2.** ☒ Start the MySQL Server at System Startup

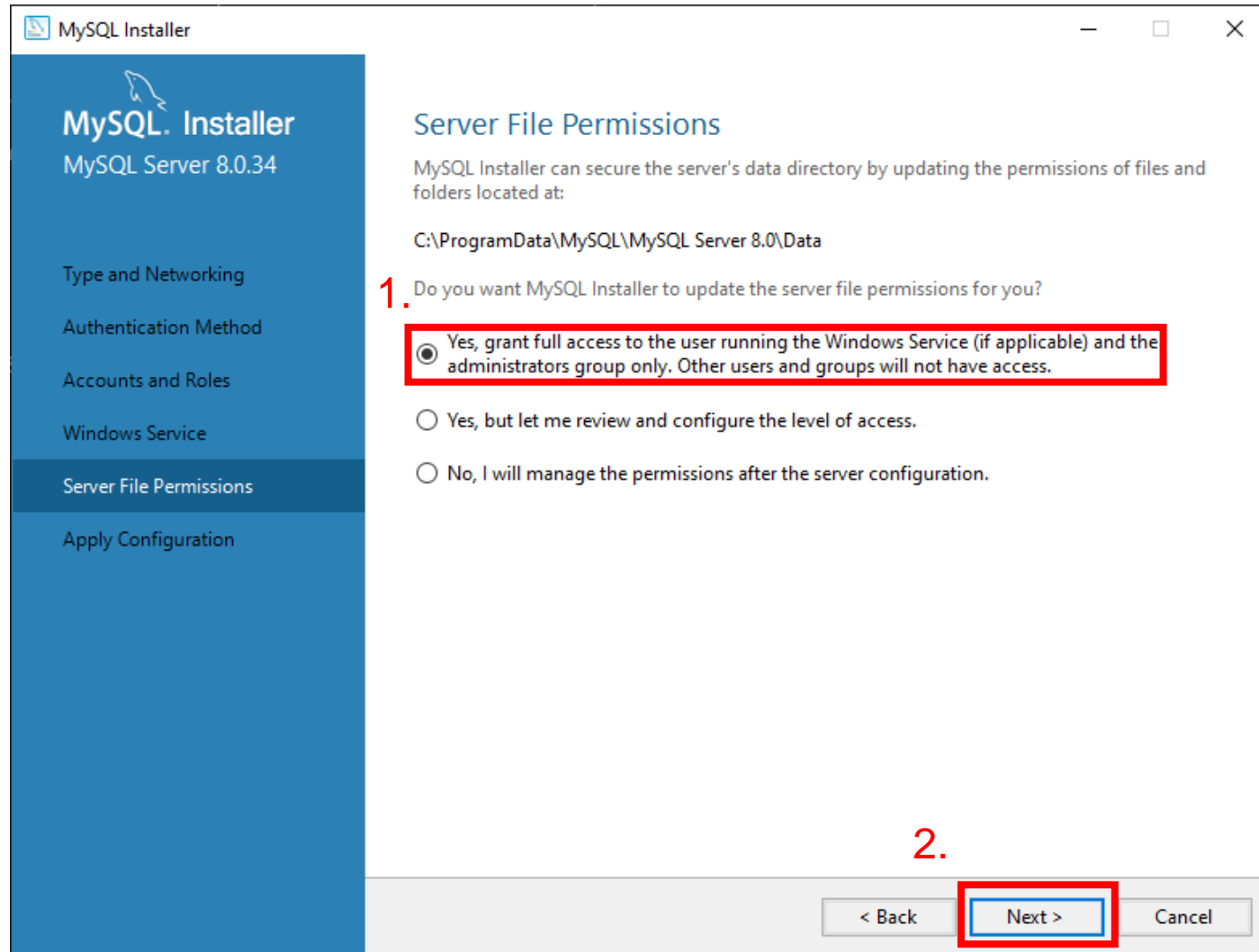
Run Windows Service as ...  
The MySQL Server needs to run under a given user account. Based on the security requirements of your system you need to pick one of the options below.

☒ Standard System Account  
Recommended for most scenarios.

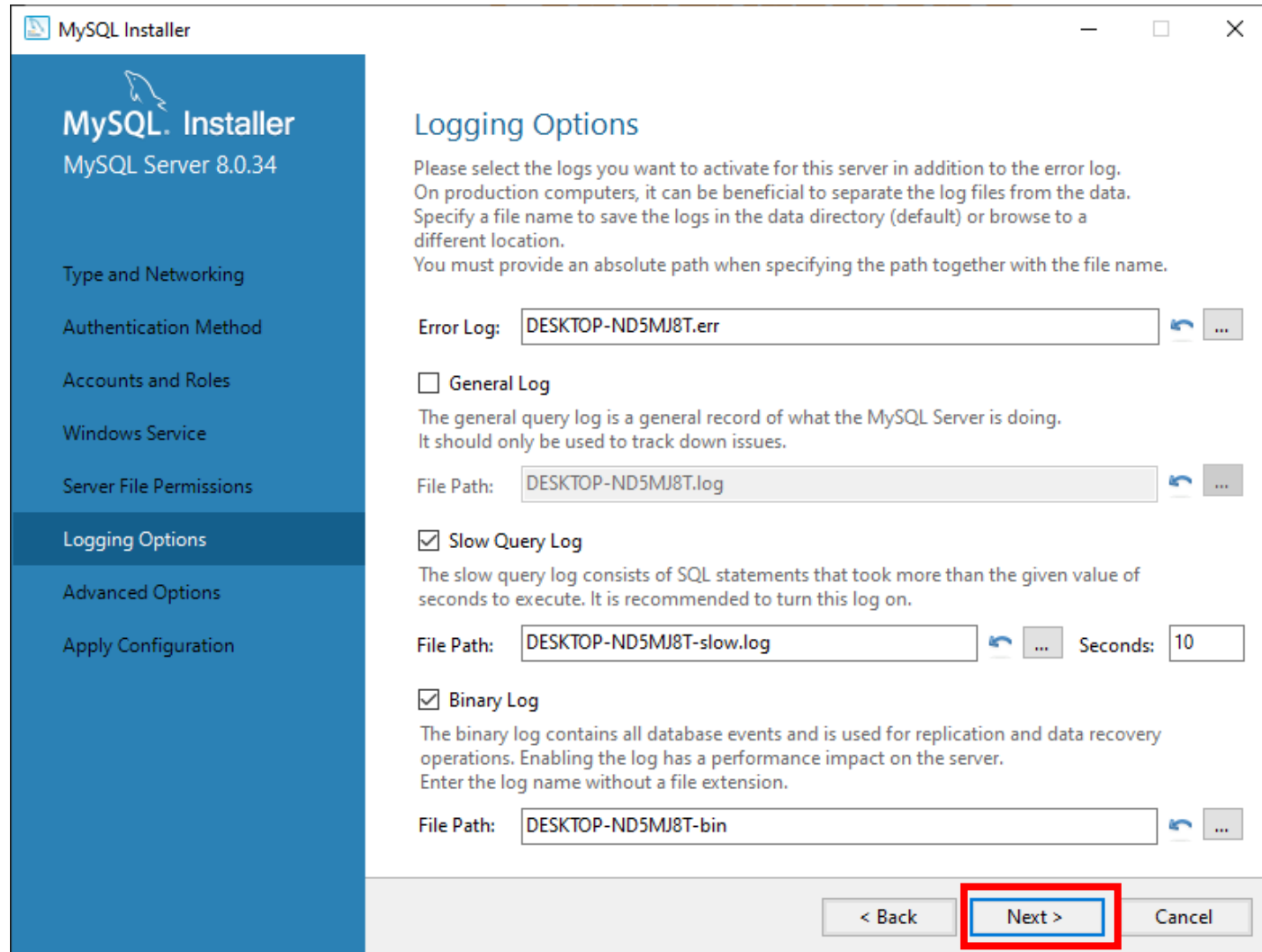
☐ Custom User  
An existing user account can be selected for advanced scenarios.

**3.**

# Configurazione



# Configurazione



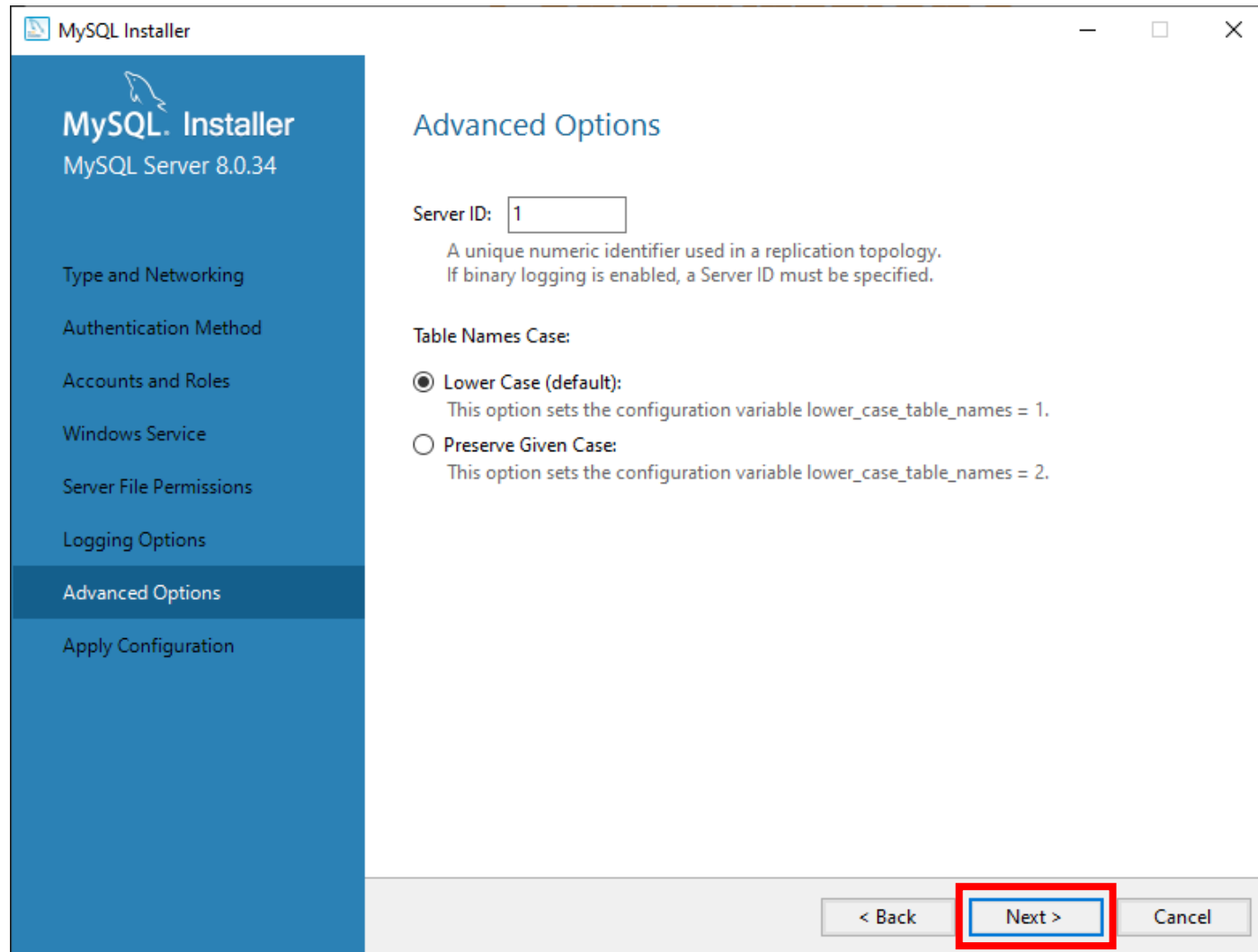
The image shows the MySQL Installer window for MySQL Server 8.0.34. The left sidebar contains a list of configuration steps: Type and Networking, Authentication Method, Accounts and Roles, Windows Service, Server File Permissions, Logging Options (highlighted), Advanced Options, and Apply Configuration. The main area is titled 'Logging Options' and contains instructions: 'Please select the logs you want to activate for this server in addition to the error log. On production computers, it can be beneficial to separate the log files from the data. Specify a file name to save the logs in the data directory (default) or browse to a different location. You must provide an absolute path when specifying the path together with the file name.'

The configuration includes three log types:

- Error Log:** The file path is set to 'DESKTOP-ND5MJ8T.err'.
- General Log:** This option is unchecked. The description states: 'The general query log is a general record of what the MySQL Server is doing. It should only be used to track down issues.' The file path is set to 'DESKTOP-ND5MJ8T.log'.
- Slow Query Log:** This option is checked. The description states: 'The slow query log consists of SQL statements that took more than the given value of seconds to execute. It is recommended to turn this log on.' The file path is set to 'DESKTOP-ND5MJ8T-slow.log' and the duration is set to 10 seconds.
- Binary Log:** This option is checked. The description states: 'The binary log contains all database events and is used for replication and data recovery operations. Enabling the log has a performance impact on the server. Enter the log name without a file extension.' The file path is set to 'DESKTOP-ND5MJ8T-bin'.

At the bottom of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a red rectangle.

# Configurazione

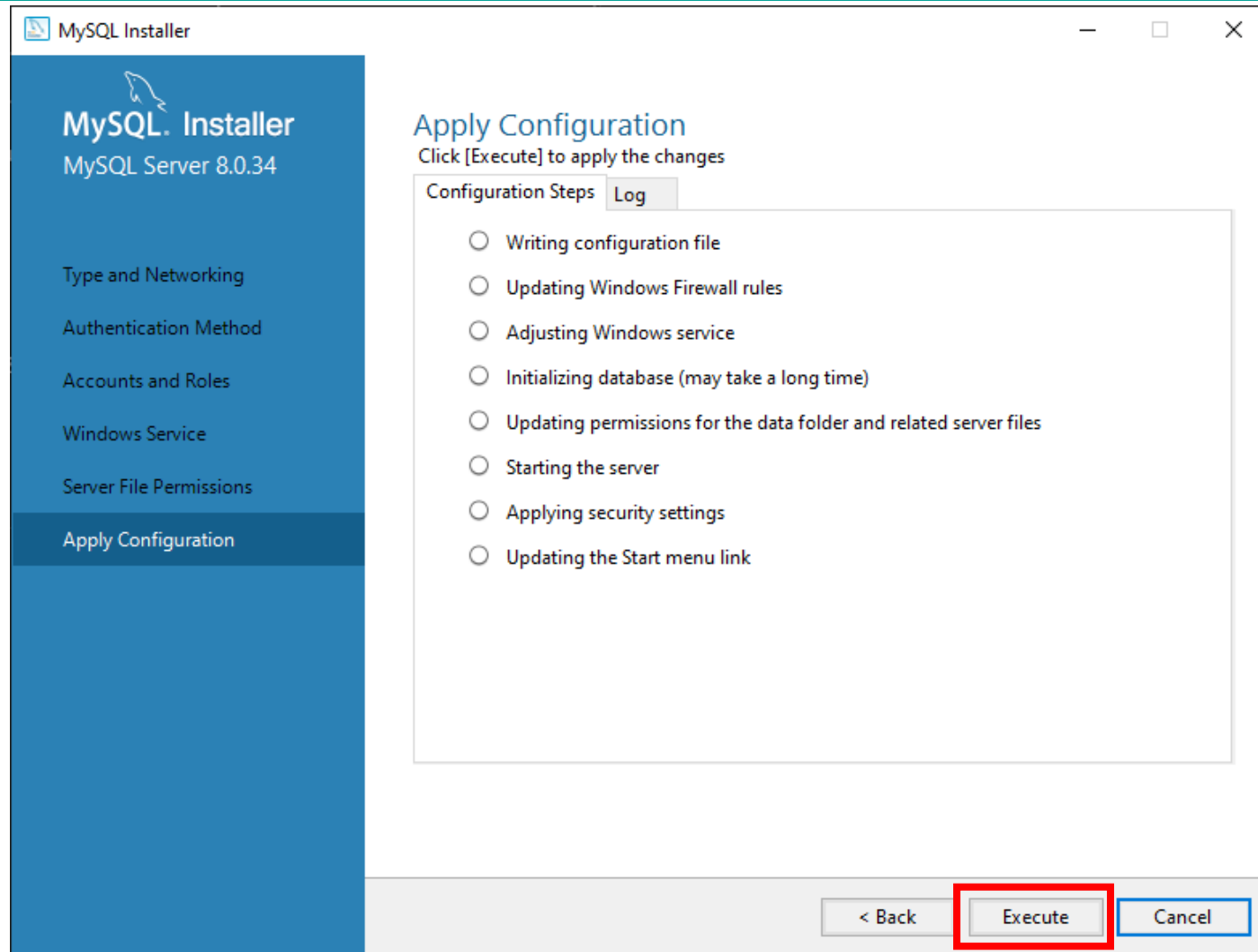


The image shows the MySQL Installer window for MySQL Server 8.0.34. The left sidebar contains a list of configuration steps: Type and Networking, Authentication Method, Accounts and Roles, Windows Service, Server File Permissions, Logging Options, Advanced Options (which is currently selected and highlighted in a darker blue), and Apply Configuration. The main area is titled 'Advanced Options' and contains the following settings:

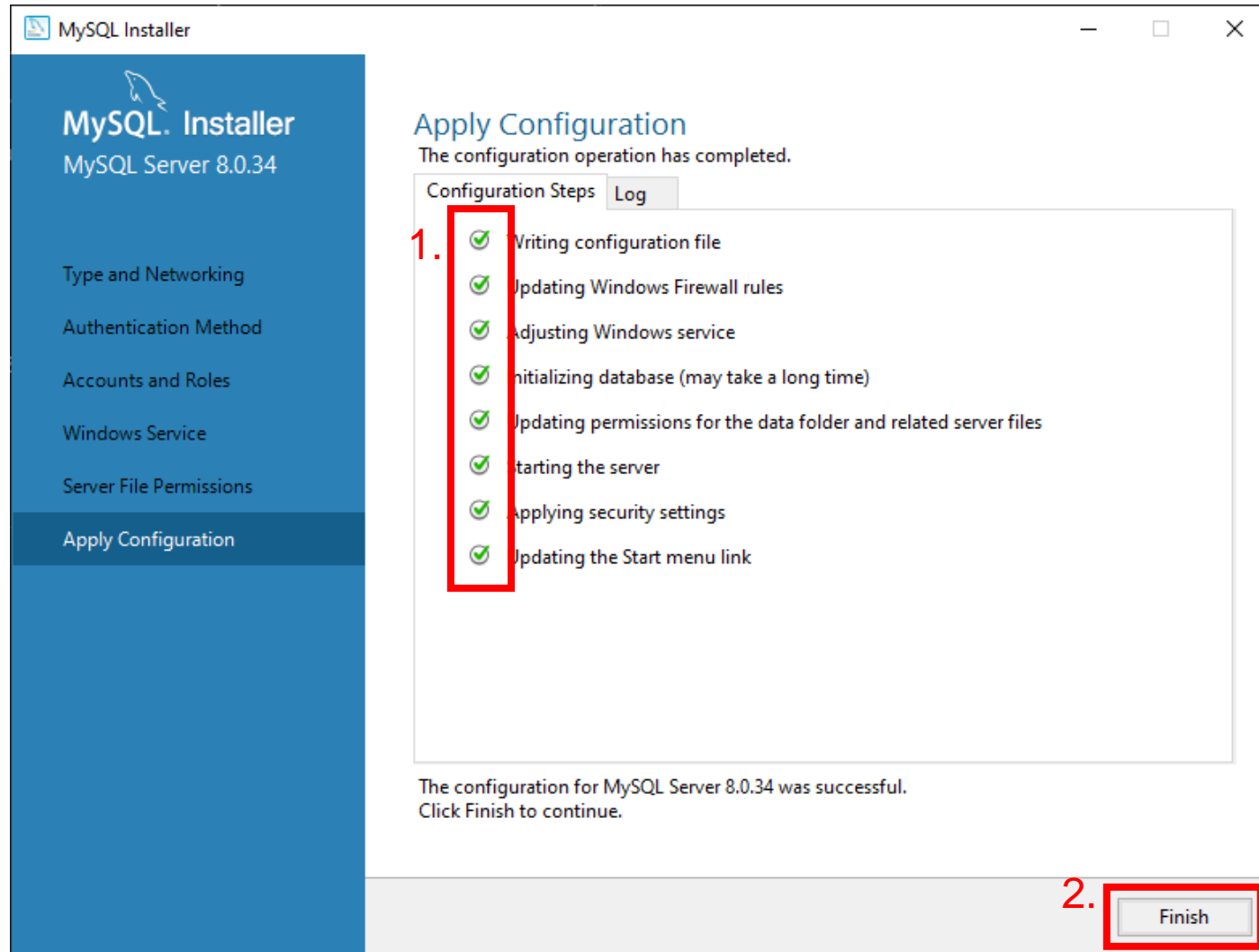
- Server ID:** A text box containing the value '1'. Below it, a note states: 'A unique numeric identifier used in a replication topology. If binary logging is enabled, a Server ID must be specified.'
- Table Names Case:**
  - ☒ **Lower Case (default):**  
This option sets the configuration variable `lower_case_table_names = 1`.
  - ☐ **Preserve Given Case:**  
This option sets the configuration variable `lower_case_table_names = 2`.

At the bottom right of the window, there are three buttons: '< Back', 'Next >', and 'Cancel'. The 'Next >' button is highlighted with a red rectangular border.

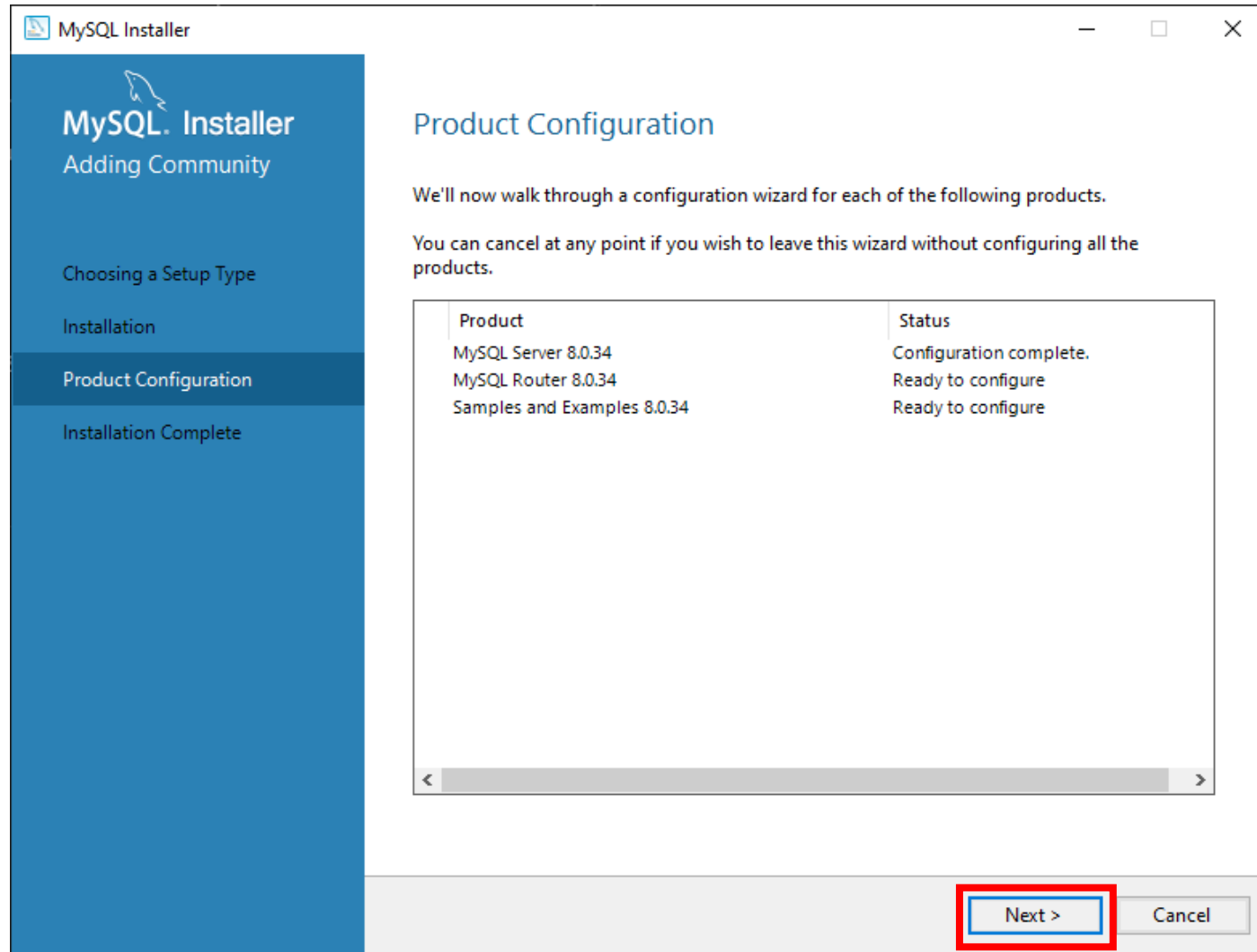
# Configurazione



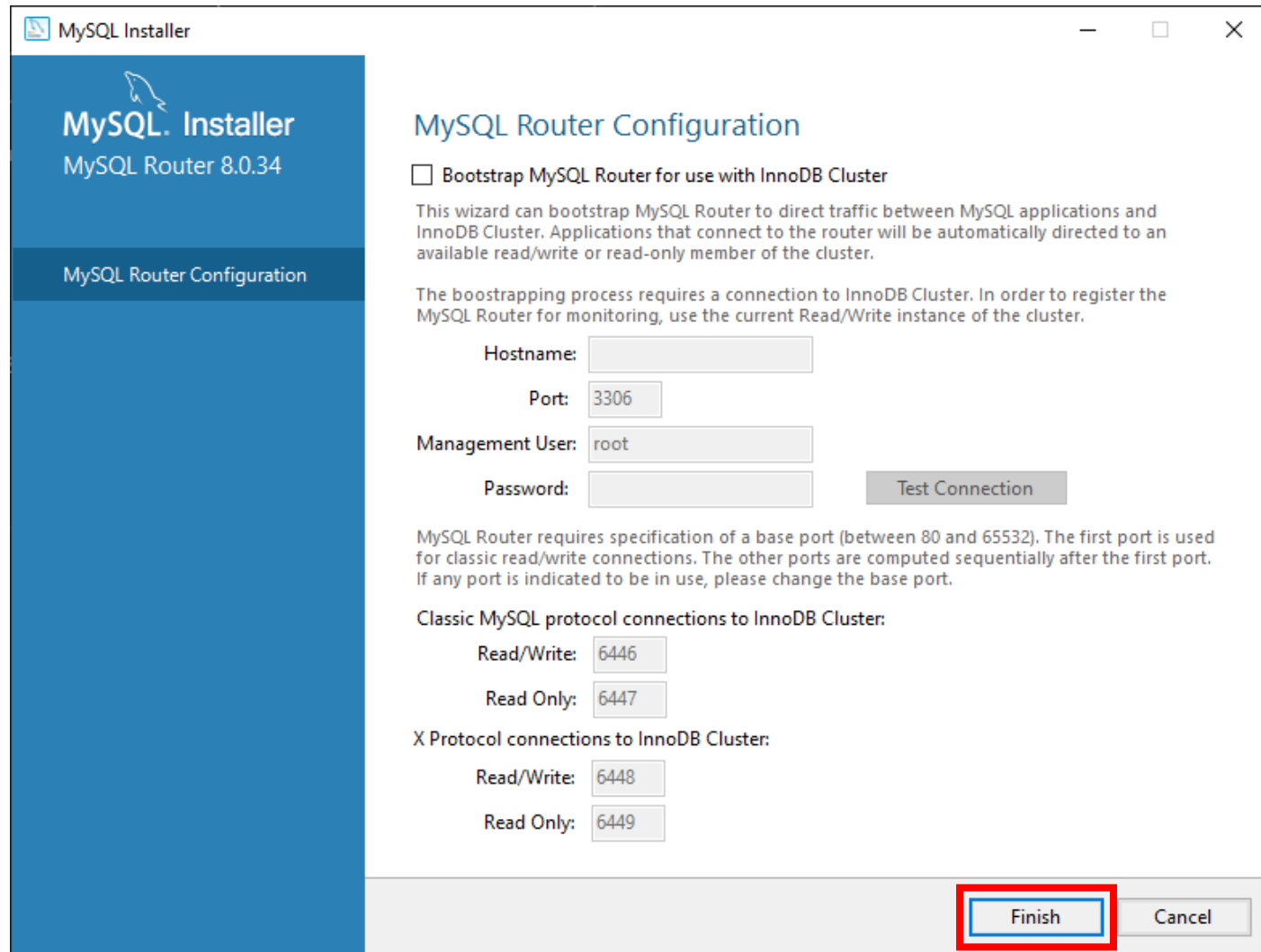
# Configurazione



# Configurazione



# Configurazione

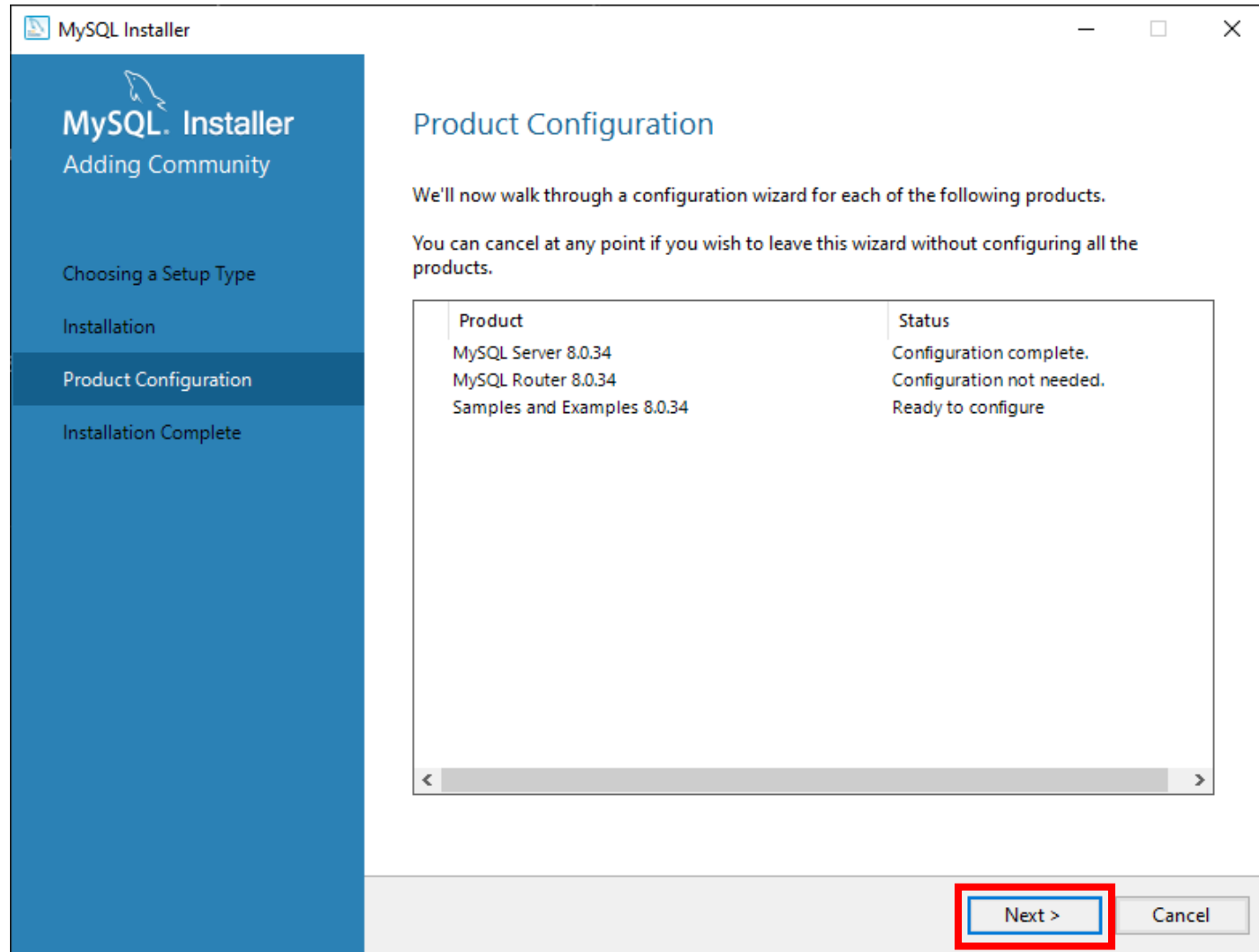


The image shows a screenshot of the MySQL Installer application window, specifically the 'MySQL Router Configuration' step. The window has a blue sidebar on the left with the MySQL logo and the text 'MySQL. Installer' and 'MySQL Router 8.0.34'. The main area is white and contains the following elements:

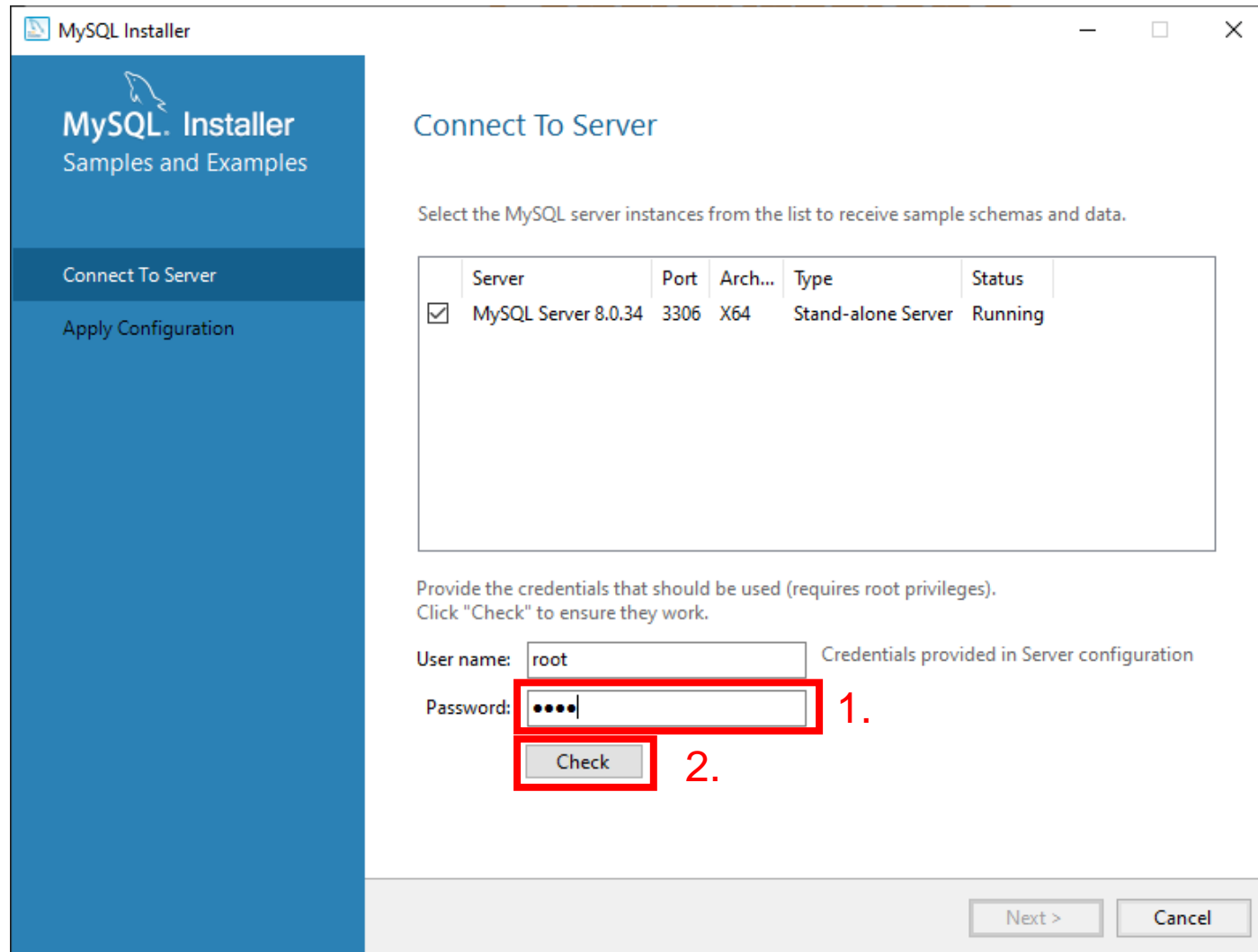
- Title Bar:** 'MySQL Installer' with standard window controls (minimize, maximize, close).
- Section Header:** 'MySQL Router Configuration'.
- Checkbox:** ☐ Bootstrap MySQL Router for use with InnoDB Cluster.
- Description:** 'This wizard can bootstrap MySQL Router to direct traffic between MySQL applications and InnoDB Cluster. Applications that connect to the router will be automatically directed to an available read/write or read-only member of the cluster.'
- Instructions:** 'The bootstrapping process requires a connection to InnoDB Cluster. In order to register the MySQL Router for monitoring, use the current Read/Write instance of the cluster.'
- Fields:**
  - Hostname: [Empty text box]
  - Port: [3306]
  - Management User: [root]
  - Password: [Empty password box]
- Button:** 'Test Connection' (disabled).
- Text:** 'MySQL Router requires specification of a base port (between 80 and 65532). The first port is used for classic read/write connections. The other ports are computed sequentially after the first port. If any port is indicated to be in use, please change the base port.'
- Section Header:** 'Classic MySQL protocol connections to InnoDB Cluster:'.
- Fields:**
  - Read/Write: [6446]
  - Read Only: [6447]
- Section Header:** 'X Protocol connections to InnoDB Cluster:'.
- Fields:**
  - Read/Write: [6448]
  - Read Only: [6449]
- Buttons:** 'Finish' (highlighted with a red rectangle) and 'Cancel'.



# Configurazione



# Configurazione



The image shows the 'Connect To Server' window of the MySQL Installer. On the left is a blue sidebar with the MySQL logo and the text 'MySQL. Installer Samples and Examples'. Below this are two buttons: 'Connect To Server' (highlighted) and 'Apply Configuration'. The main area is titled 'Connect To Server' and contains the instruction: 'Select the MySQL server instances from the list to receive sample schemas and data.' Below this is a table with columns: 'Server', 'Port', 'Arch...', 'Type', and 'Status'. One row is visible, checked with a checkbox: 'MySQL Server 8.0.34', '3306', 'X64', 'Stand-alone Server', and 'Running'. Below the table, it says: 'Provide the credentials that should be used (requires root privileges). Click "Check" to ensure they work.' There are two input fields: 'User name:' with 'root' and 'Password:' with four dots. To the right of the password field is the text 'Credentials provided in Server configuration'. Below the password field is a 'Check' button. At the bottom right are 'Next >' and 'Cancel' buttons. Red annotations highlight the password field with a red box and the number '1.', and the 'Check' button with a red box and the number '2.'.

MySQL. Installer  
Samples and Examples

Connect To Server

Apply Configuration

### Connect To Server

Select the MySQL server instances from the list to receive sample schemas and data.

Server	Port	Arch...	Type	Status
<input checked="" type="checkbox"/> MySQL Server 8.0.34	3306	X64	Stand-alone Server	Running

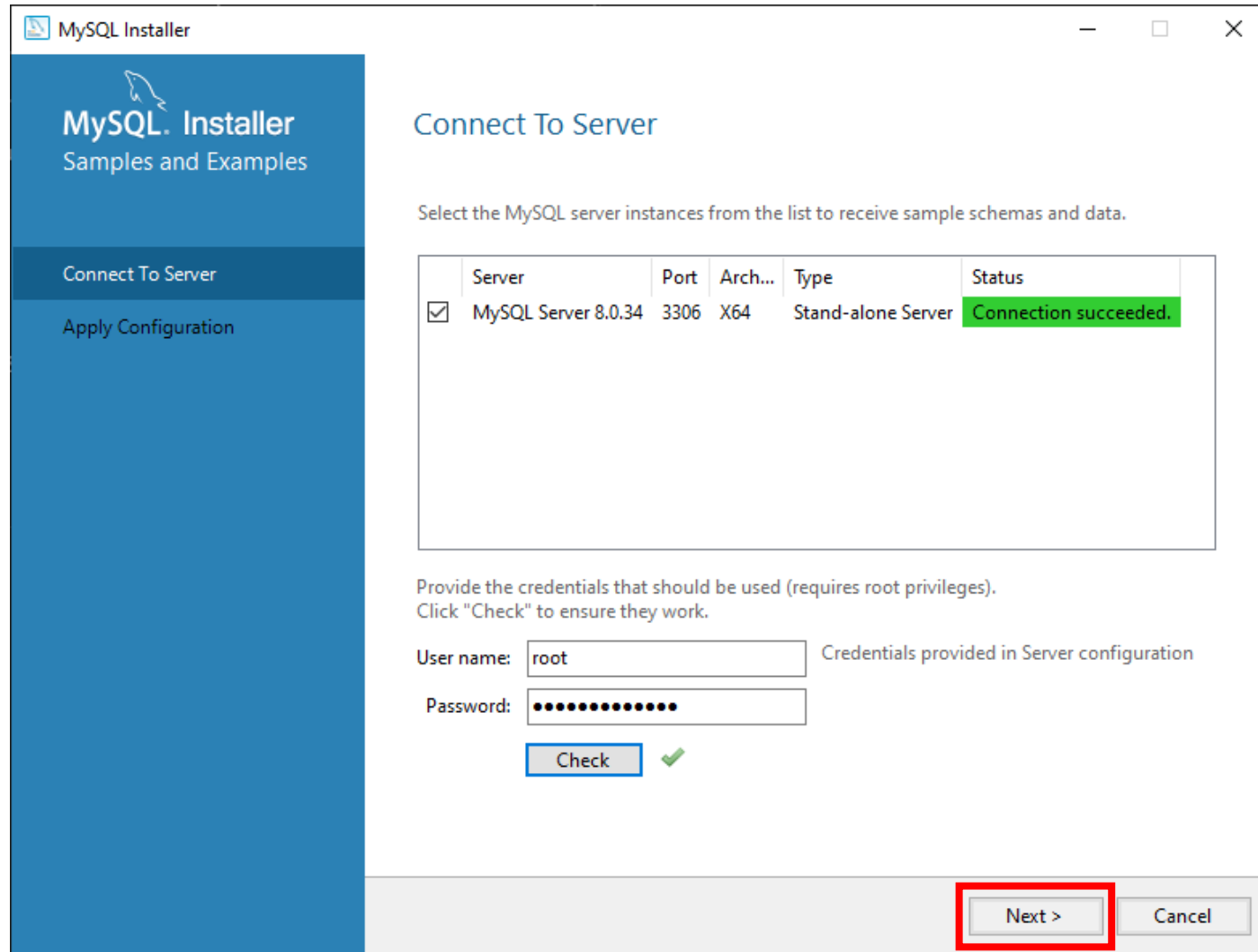
Provide the credentials that should be used (requires root privileges).  
Click "Check" to ensure they work.

User name:  Credentials provided in Server configuration

Password:  1.

2.

# Configurazione



The image shows the 'Connect To Server' window of the MySQL Installer. The window has a blue sidebar on the left with the MySQL logo and the text 'MySQL Installer Samples and Examples'. The main area is titled 'Connect To Server' and contains instructions to select MySQL server instances. A table lists one instance: 'MySQL Server 8.0.34' on port '3306', architecture 'X64', type 'Stand-alone Server', and status 'Connection succeeded.'. Below the table, there are fields for 'User name' (root) and 'Password' (masked with dots), with a 'Check' button and a green checkmark. At the bottom right, the 'Next >' button is highlighted with a red rectangle.

MySQL Installer

MySQL. Installer  
Samples and Examples

Connect To Server

Apply Configuration

### Connect To Server


Select the MySQL server instances from the list to receive sample schemas and data.

	Server	Port	Arch...	Type	Status
<input checked="" type="checkbox"/>	MySQL Server 8.0.34	3306	X64	Stand-alone Server	Connection succeeded.

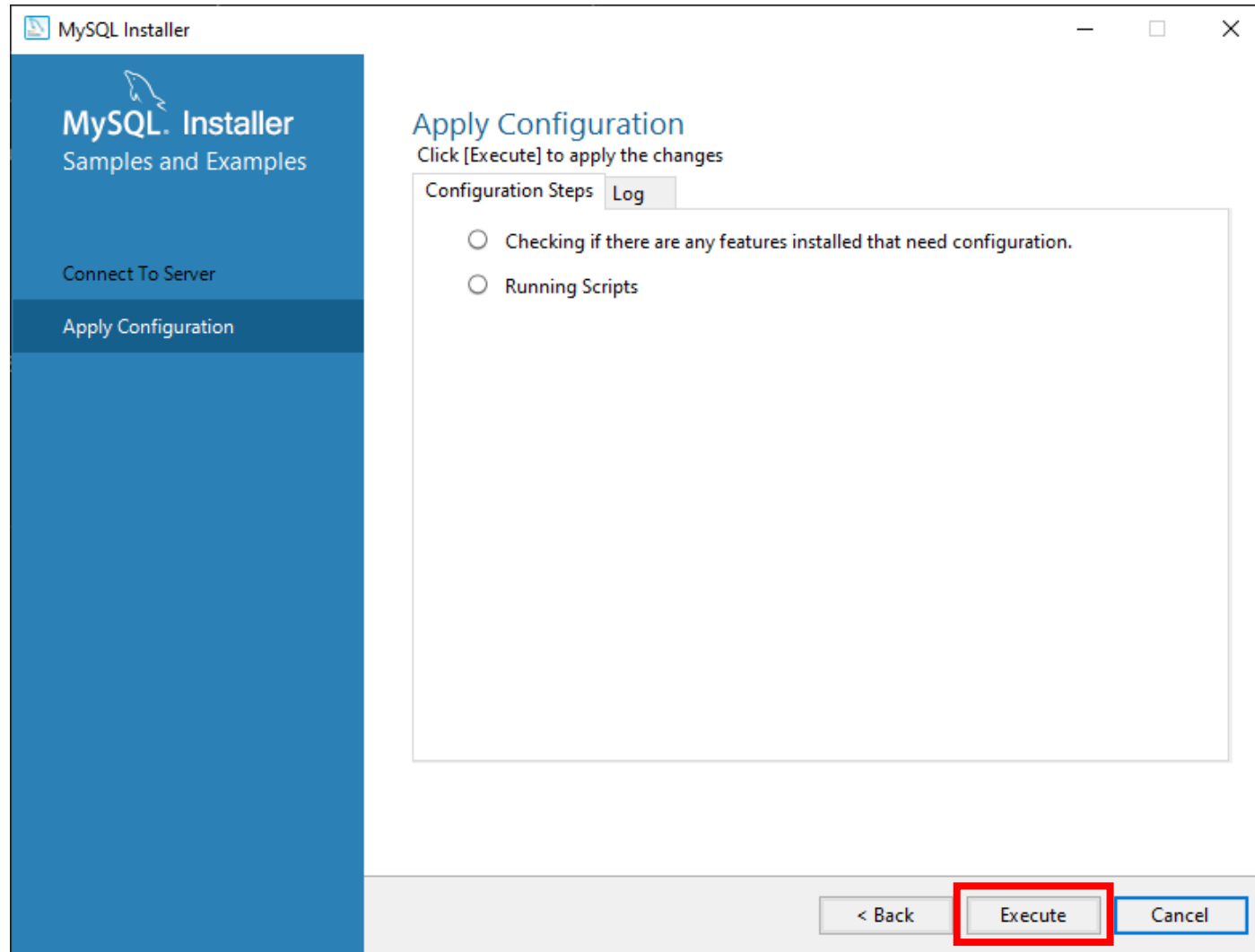
Provide the credentials that should be used (requires root privileges).  
Click "Check" to ensure they work.

User name:  Credentials provided in Server configuration

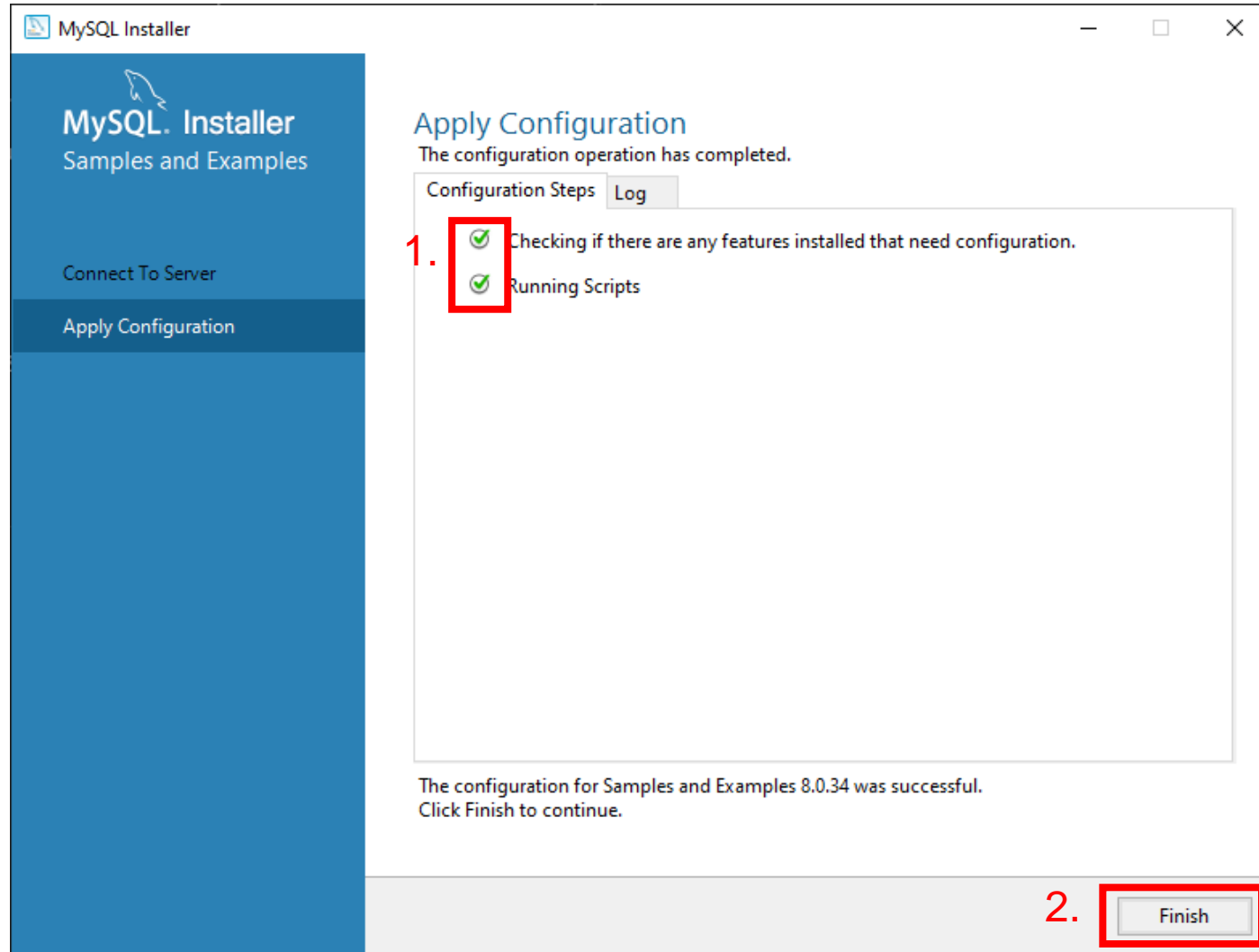
Password:



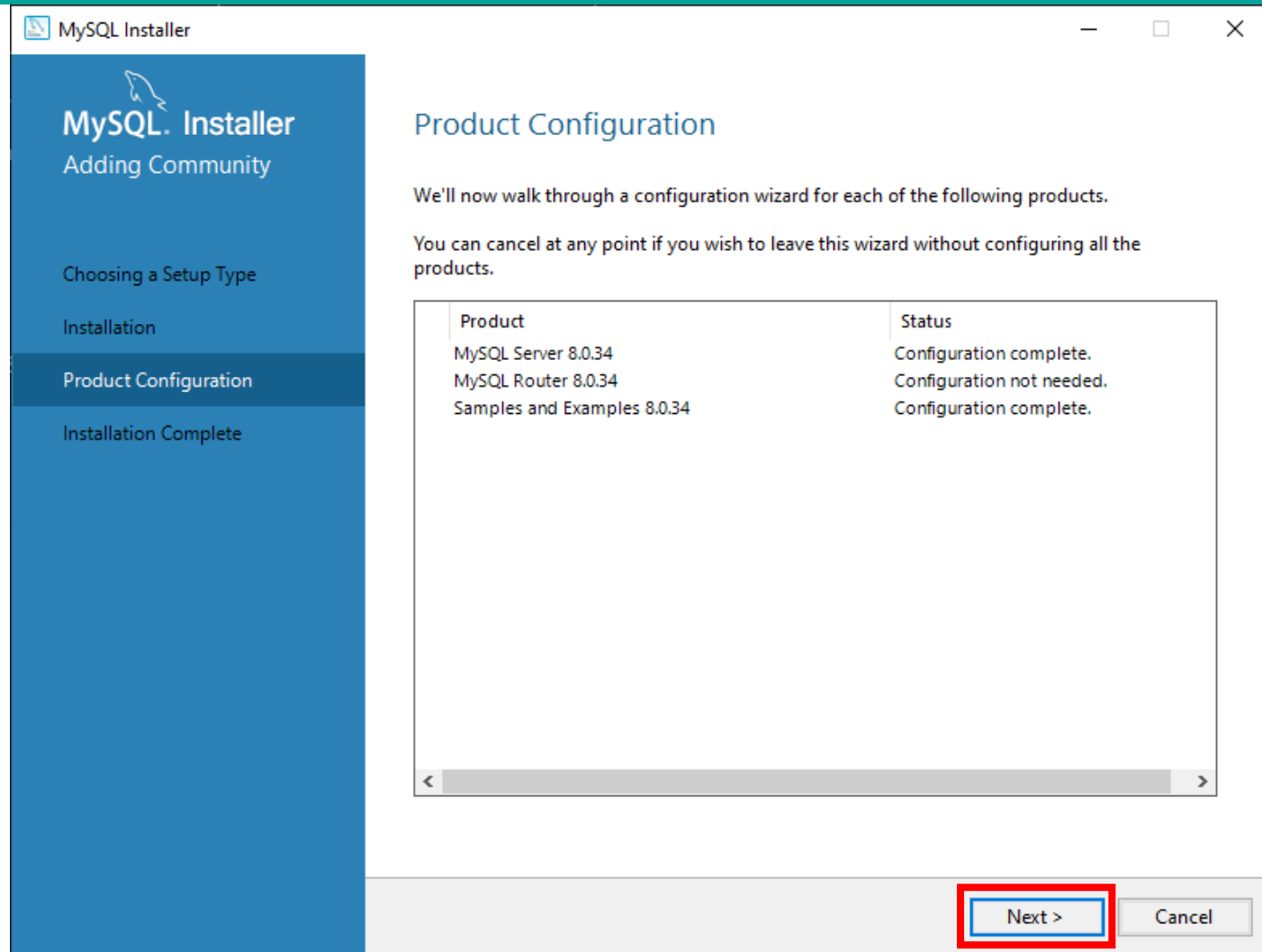
# Configurazione



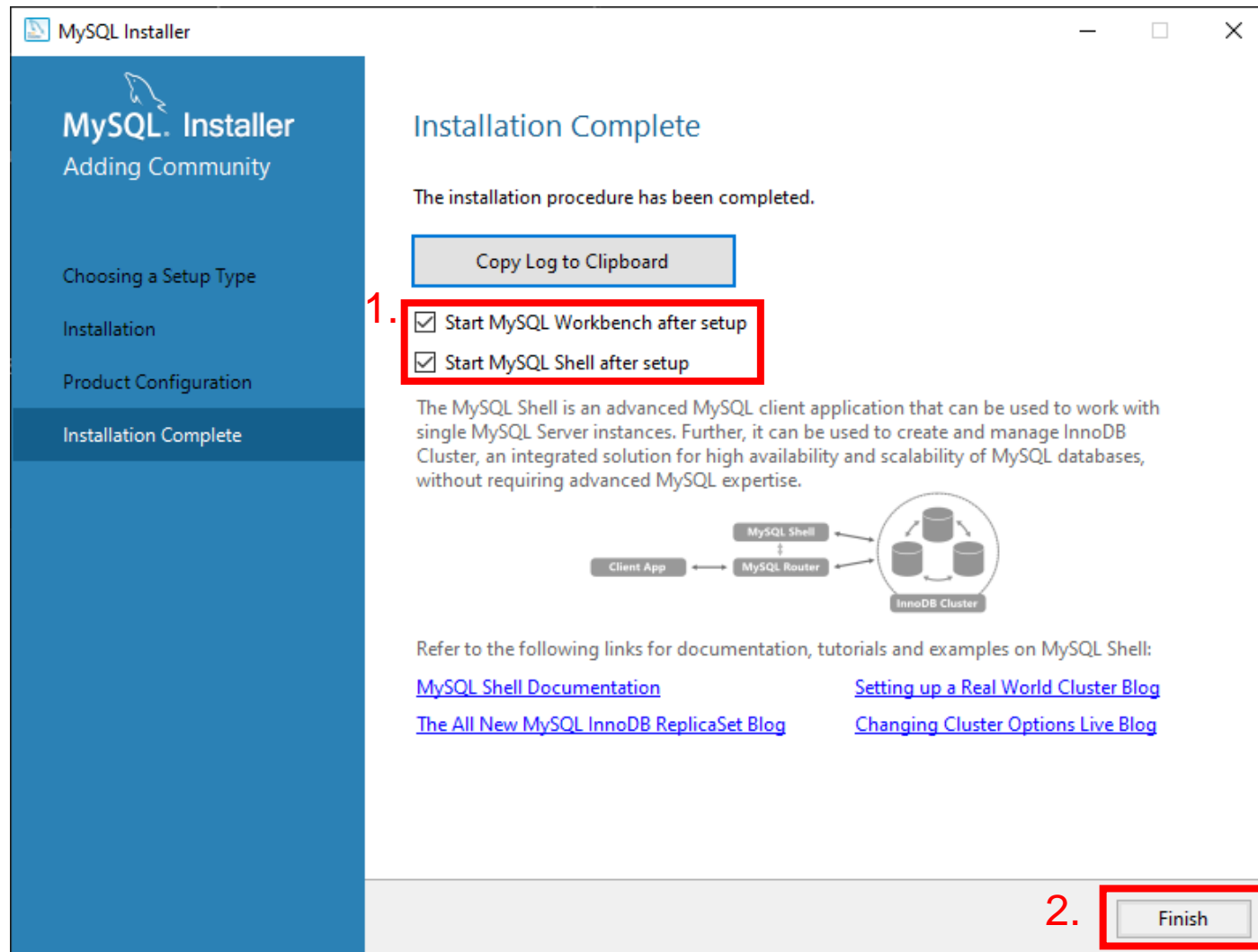
# Configurazione



# Configurazione

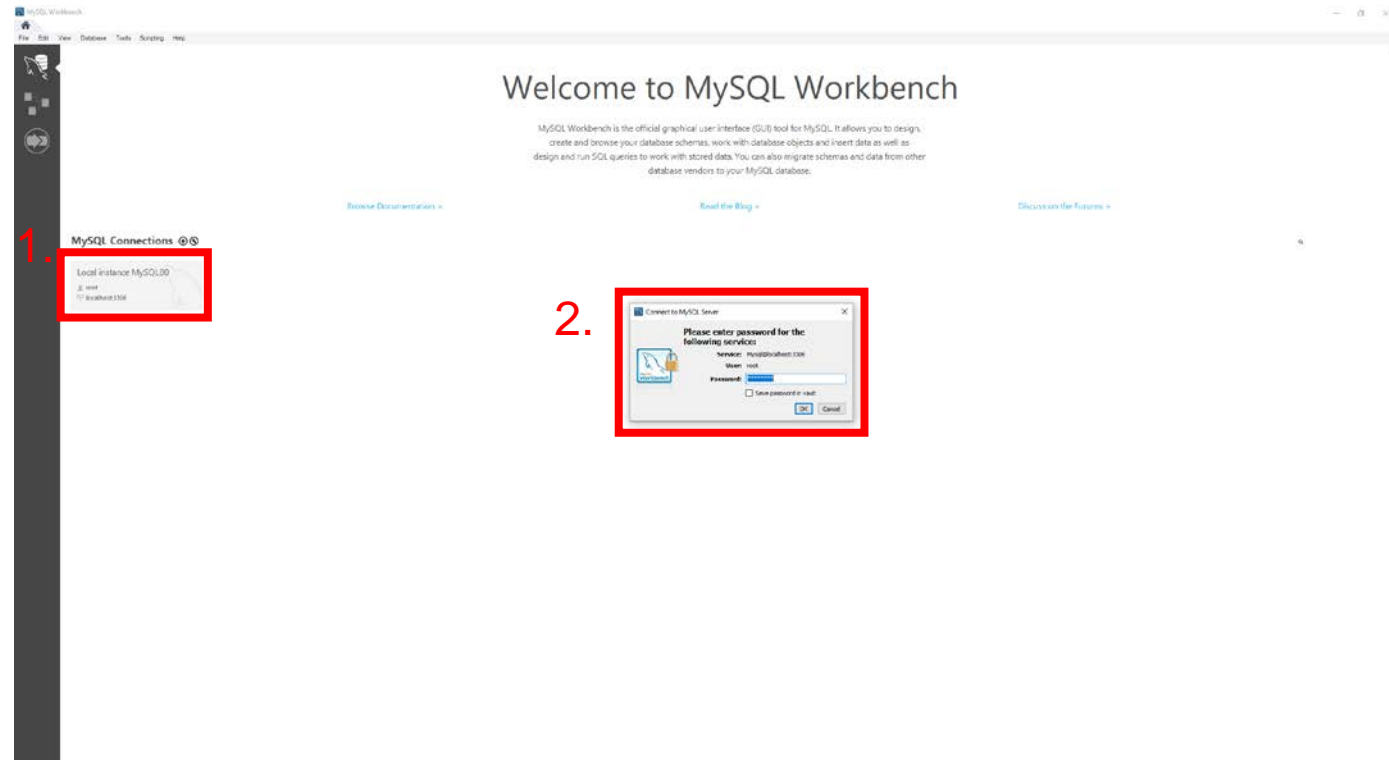
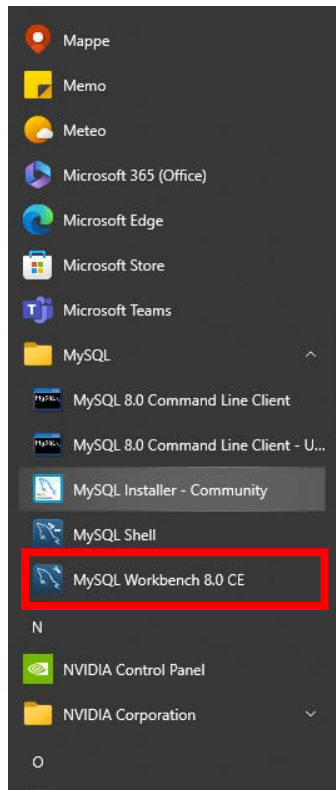


# Configurazione



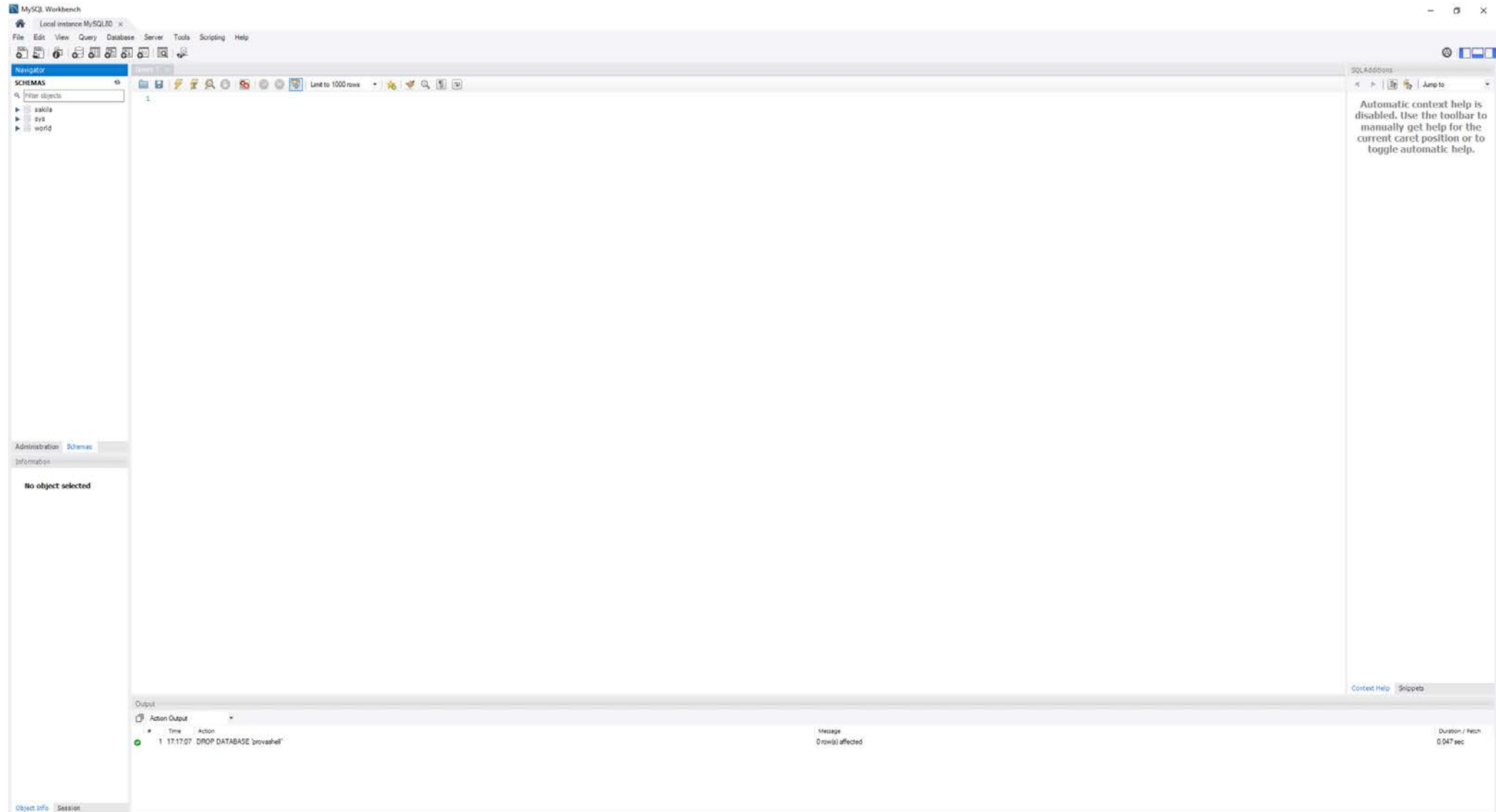
# MySQL Workbench

- Con l'installazione di MySQL è stato installato anche il MySQL Workbench
  - Un client MySQL con interfaccia grafica





# MySQL Workbench



# Creazione di tabelle

- Per creare un database si può usare il comando: `create schema <nomeDB>;`
- Una volta creato il db si possono creare le tabelle che dovrà contenere
  - Ricordate di effettuare prima il comando: `use <nomeDB>;`
  - Il comando per creare una tabella è il seguente:

```
CREATE TABLE contocorrente(  
  numerocc          CHAR(6) PRIMARY KEY,  
  cognome           VARCHAR(20) NOT NULL,  
  nome              VARCHAR(20) NOT NULL,  
  cf                CHAR(16) NOT NULL,  
  datanascita       DATE NOT NULL,  
  luogonascita       VARCHAR(25),  
  telefono          CHAR(12),  
  indirizzo         VARCHAR (30),  
  saldo             NUMERIC(15,2),  
  tipo              CHAR(2)  
  ) ;
```

# Creazione di tabelle

---

- Una volta creato il db si possono creare le tabelle che dovrà contenere

```
CREATE TABLE operazione(  
    codice          CHAR(6) PRIMARY KEY,  
    data            DATE NOT NULL,  
    ora             TIME NOT NULL,  
    cc              CHAR(6),  
    tipo            CHAR(1),  
    importo         NUMERIC(15,2),  
    descrizione     VARCHAR(30),  
    FOREIGN KEY(cc) REFERENCES contocorrente(numerocc)  
    ON UPDATE CASCADE  
    ON DELETE CASCADE  
);
```

# Creazione di tabelle

- Una volta creato il db si possono creare le tabelle che dovrà contenere
- Alcune osservazioni:
  - Ci sono delle piccole differenze rispetto agli esempi visti a lezione dovute all'implementazione di SQL da parte di MySQL:
    - ✓ I nomi degli attributi non contengono altro che lettere, non sono ammessi simboli come il “-”
    - ✓ Tutti gli attributi sono in minuscolo, non è obbligatorio, ma MySQL distingue le maiuscole dalle minuscole, quindi conviene usare sempre la stessa convenzione in tutte le query

```
CREATE TABLE operazione(  
  codice      CHAR(6) PRIMARY KEY,  
  data        DATE NOT NULL,  
  ora         TIME NOT NULL,  
  cc          CHAR(6),  
  tipo        CHAR(1),  
  importo     NUMERIC(15,2),  
  descrizione VARCHAR(30),  
  FOREIGN KEY(cc) REFERENCES contocorrente(numerocc)  
    ON UPDATE CASCADE  
    ON DELETE CASCADE  
);
```

# Inserimento dati

---

- Vediamo come si possono inserire i dati all'interno delle tabelle
  - Il comando per inserire i dati in una tabella è il seguente:

```
INSERT INTO contocorrente(numerocc, cognome, nome, cf,  
                           datanascita, luogonascita, telefono,  
                           indirizzo, saldo, tipo)  
VALUES("2000", "Rossi", "Mario", "dddddddddddddddddd",  
      "1980-11-01", "Roma", "1", "2", 10000, "bi");
```

```
INSERT INTO contocorrente(  
numerocc, cognome, nome, cf, datanascita, luogonascita, telefono, indirizzo, saldo, tipo)  
VALUES ("2000", "Rossi", "Mario", "dddddddddddddddddd", "1980-11-01", "Roma", "1", "2", 10000, "bi");
```

# Inserimento dati

---

- Caricare ogni tupla da linea di comando è oneroso
  - È possibile scrivere tutte le query di inserimento in un file e richiamarlo da linea di comando attraverso `source <pathFile>;`
  - In alternativa, è possibile caricare i dati da un file .csv
    - ✓ Il file .csv deve contenere una riga di valori per ogni tupla da inserire
    - ✓ Un file così costruito potrà essere automaticamente caricato mediante il seguente comando:  
`LOAD DATA LOCAL INFILE '<pathFile>' INTO TABLE contocorrente FIELDS TERMINATED BY ',' LINES TERMINATED BY '\n' (numerocc, cognome, nome, cf, datanascita, luogonascita, telefono, indirizzo, saldo, tipo);`

```
LOAD DATA LOCAL infile 'C:/Users/berna/Documents/data.csv' into table contocorrente
fields terminated by ',' lines terminated by '\n'
(numerocc, cognome, nome, cf, datanascita, luogonascita, telefono, indirizzo, saldo, tipo);
```

# Problema con Workbench e LOAD DATA

- In MySQL Workbench potreste avere problemi ad eseguire il comando **LOAD DATA LOCAL INFILE** ...
- Per risolvere, provate ad adottare uno (o più dei seguenti metodi)
  - Aggiungere i parametri **OPT\_LOCAL\_INFILE=1** e **LOCAL\_INFILE=1** tra le opzioni di avvio di MySQL server
    - ✓ Database > Manage Connections >
    - ✓ Selezionate la connessione MySQL creata, nome di default «Local Instance MySQL80»
    - ✓ Selezionate il Tab **Advanced**
    - ✓ Aggiungere i parametri nel box **Others**:
  - Deselezionare la policy **secure-file-priv**
    - ✓ Server > Options File >
    - ✓ Attivare il tab **Security**
    - ✓ Deselezionare la policy **secure-file-priv**
    - ✓ Cliccare su **Apply**
- Nota: se vi collegate al server del laboratorio non potrete modificare la policy

# Interrogazioni



- Ecco alcuni esempi di query

```
SELECT *  
FROM contocorrente;
```

	numerocc	cognome	nome	cf	datanascita	luogonascita	telefono	indirizzo	saldo	tipo
▶	2000	Rossi	Mario	dddddddddddddd	1980-11-01	Roma	1	2	10000.00	b
	2001	Bianchi	Luca	eeeeeeeeeeeeee	1995-05-15	Milano	3	4	15000.00	b
	2002	Verdi	Laura	ffffffffffffff	1988-07-20	Napoli	5	6	12000.00	b
	2003	Ferrari	Giuseppe	gggggggggggggg	1976-03-10	Torino	7	8	8000.00	b
	2004	Russo	Angela	hhhhhhhhhhhhhh	1990-09-05	Firenze	9	10	20000.00	b
	2005	Gallo	Roberto	iiiiiiiiii	1985-12-18	Bologna	11	12	13000.00	b
	2006	Marino	Sara	jjjjjjjjjjjj	1998-02-25	Genova	13	14	18000.00	b
	2007	Conti	Luigi	kkkkkkkkkkkkkk	1972-06-30	Palermo	15	16	9000.00	b
	2008	Costa	Anna	llllllllll	1983-08-12	Catania	17	18	16000.00	b
	2009	Ferrara	Giovanni	mmmmmmmmmmmmmm	1992-04-03	Bari	19	20	11000.00	b
★	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

```
SELECT COUNT(*) AS num  
FROM contocorrente;  
WHERE saldo >= 10000;
```

```
45 • SELECT COUNT(*) AS num  
46 FROM contocorrente  
47 WHERE saldo >= 10000;  
48
```

Result Grid			 Filter Rows: <input type="text"/>
	num		
▶	8		



# Outline

---

- Un caso di studio: database di un'università
    - Creazione di un database
    - Creazione di tabelle
    - Definizione dei vincoli di integrità referenziale
    - Inserimento e modifica dei dati
-

# Un caso di studio: database di un'università

Studenti

Matricola	Cognome	Nome	Data di nascita
6554	Rossi	Maria	05/12/1978
8765	Neri	Paolo	03/11/1976
9283	Verdi	Luisa	12/11/1979
3456	Rossi	Maria	01/02/1978

Corsi

Codice	Titolo	Docente
01	Analisi	Mario
02	Chimica	Bruni
04	Chimica	Verdi

Esami

Studente	Voto	Corso
3456	30	04
3456	24	02
9283	28	01
6554	26	01

# Definizione di vincoli di integrità referenziale

Studenti

Matricola	Cognome	Nome	Data di nascita
6554	Rossi	Maria	05/12/1978
8765	Neri	Paolo	03/11/1976
9283	Verdi	Luisa	12/11/1979
3456	Rossi	Maria	01/02/1978

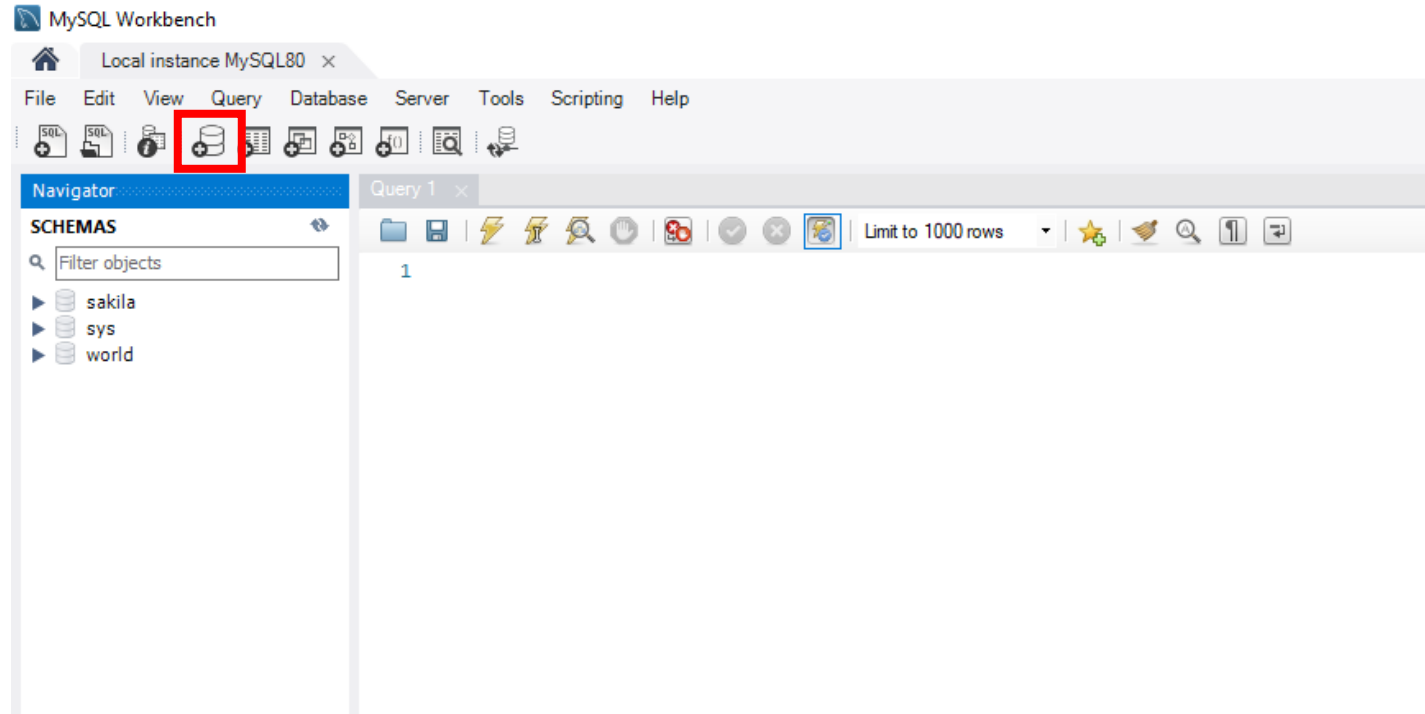
Esami

Studente	Voto	Corso
3456	30	04
3456	24	02
9283	28	01
6554	26	01

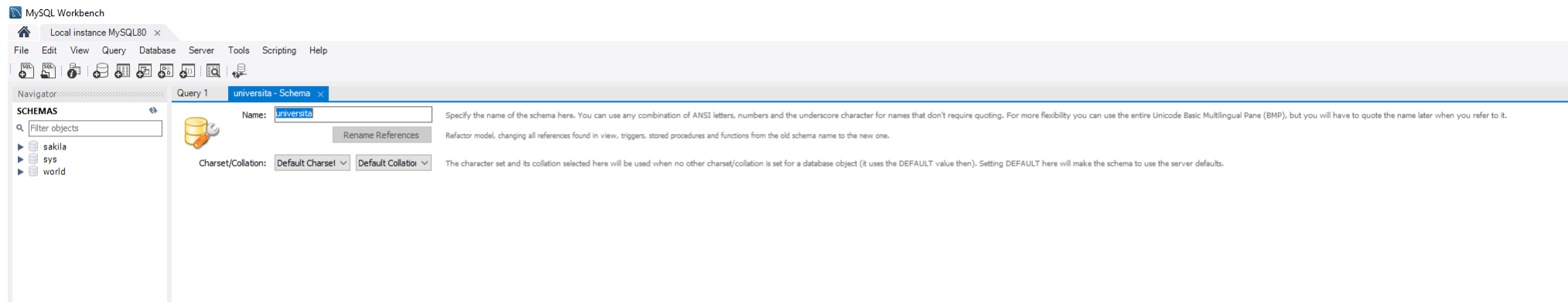
Corsi

Codice	Titolo	Docente
04	Chimica	Verdi
02	Chimica	Bruni
01	Analisi	Mario

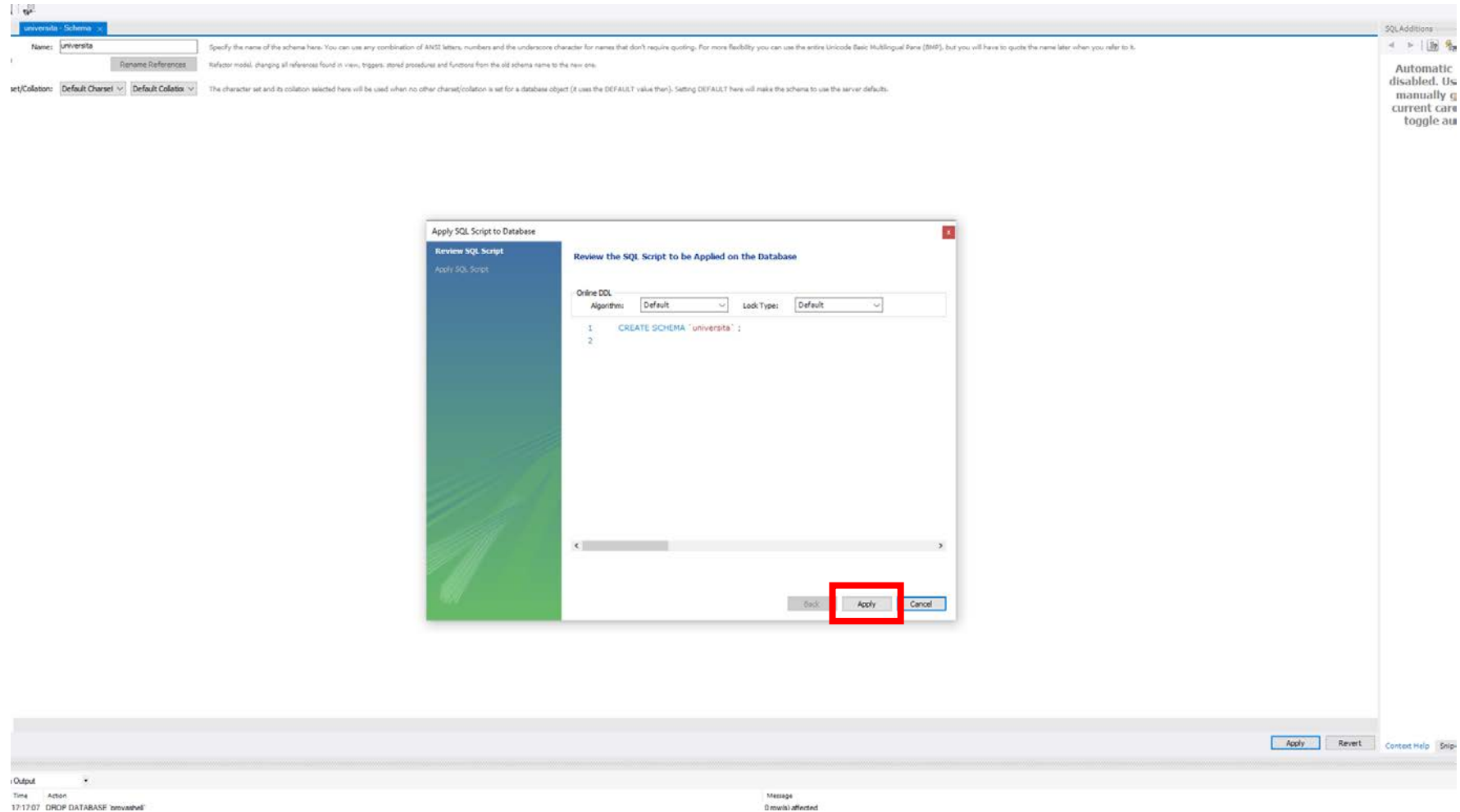
# Creazione di un database



# Creazione di un database

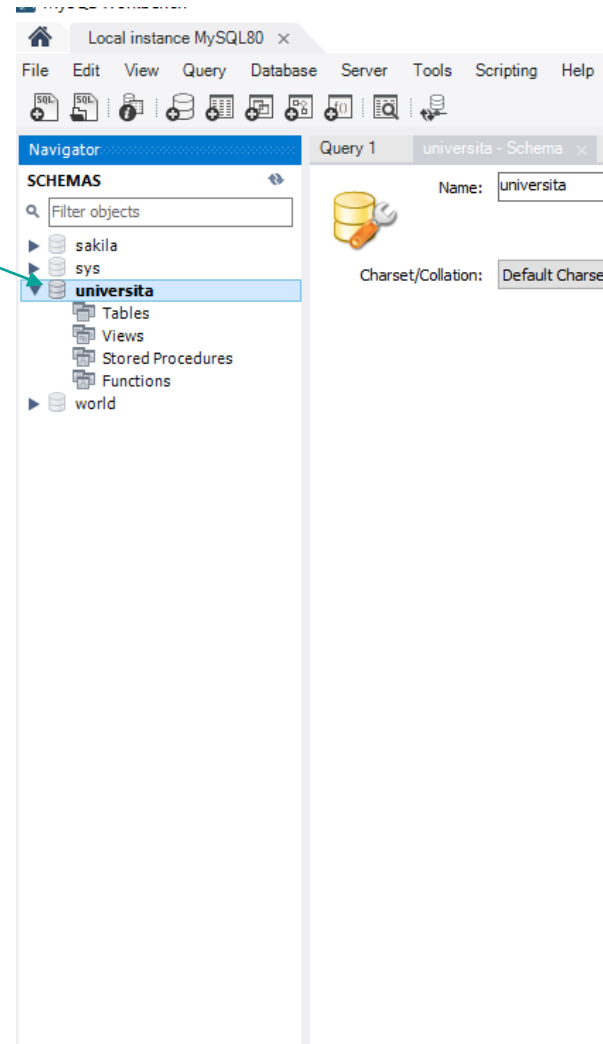


# Creazione di un database

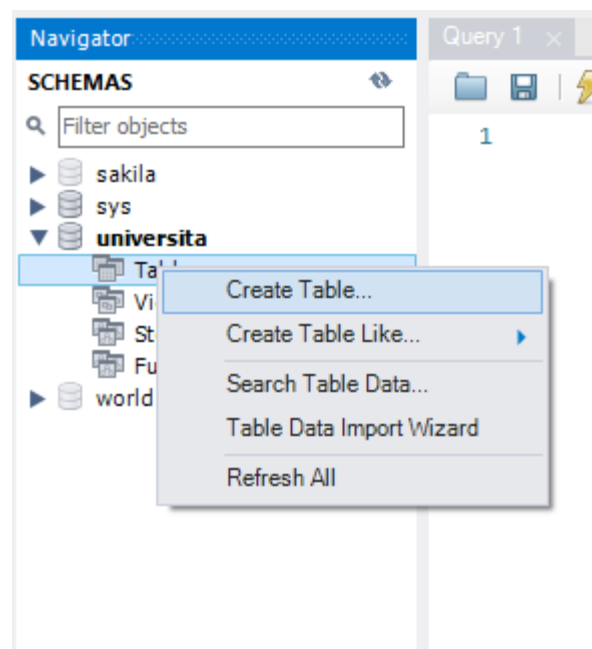


# Creazione di tabelle

Doppio click



# Creazione di tabelle





# Creazione di tabelle

Query 1: studenti - Table

Create a new stored procedure in the active schema in the connected server

Table Name:  Schema:  Engine:

Charset/Collation:

Comments:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
matricola	VARCHAR(13)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
cognome	VARCHAR(45)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
nome	VARCHAR(45)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
dataNascita	DATE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Column Name:  Data Type:

Charset/Collation:

Comments:

Storage: ☐ Virtual ☐ Stored ☐ Primary Key ☒ Not Null ☐ Unique ☐ Binary ☐ Unsigned ☐ Zero Fill ☐ Auto Increment ☐ Generated

Columns Indexes Foreign Keys Triggers Partitioning Options

Output: Action Output

#	Time	Action
---	------	--------

Message

# Creazione di tabelle

[illegible]

# Definizione di vincoli di integrità referenziale

Query 1 esami - Table x

Table Name:  Schema: **universita**

Charset/Collation:   Engine:

Comments:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
studente	VARCHAR(13)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
voto	INT(11)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
corso	INT(11)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Column Name:  Data Type:

Charset/Collation:

Comments:

Default:

Storage: ☐ Virtual ☐ Stored

☒ Primary Key ☒ Not Null ☐ Unique

☐ Binary ☐ Unsigned ☐ Zero Fill

☐ Auto Increment ☐ Generated

Columns Indexes Foreign Keys Triggers Partitioning Options

Apply Revert

# Definizione di vincoli di integrità referenziale

Query 1 esami - Table x

Table Name:  Schema: **universita**

Charset/Collation:   Engine:

Comments:

Foreign Key Name	Referenced Table	Column	Referenced Column
corso	`universita`.`corsi`	<input type="checkbox"/> studente	
studenti	`universita`.`studenti`	<input type="checkbox"/> voto	
		<input checked="" type="checkbox"/> corso	<input type="text" value="codice"/>

Foreign Key Options

On Update:

On Delete:

☐ Skip in SQL generation

Foreign Key Comment

Columns Indexes **Foreign Keys** Triggers Partitioning Options

Apply Revert

# Definizione di vincoli di integrità referenziale

Query 1 esami - Table x

Table Name:  Schema: **universita**

Charset/Collation:   Engine:

Comments:

Foreign Key Name	Referenced Table	Column	Referenced Column
corso	`universita`.`corsi`	<input checked="" type="checkbox"/> studente	matricola
studenti	`universita`.`studenti`	<input type="checkbox"/> voto	
		<input type="checkbox"/> corso	

Foreign Key Options

On Update:

On Delete:

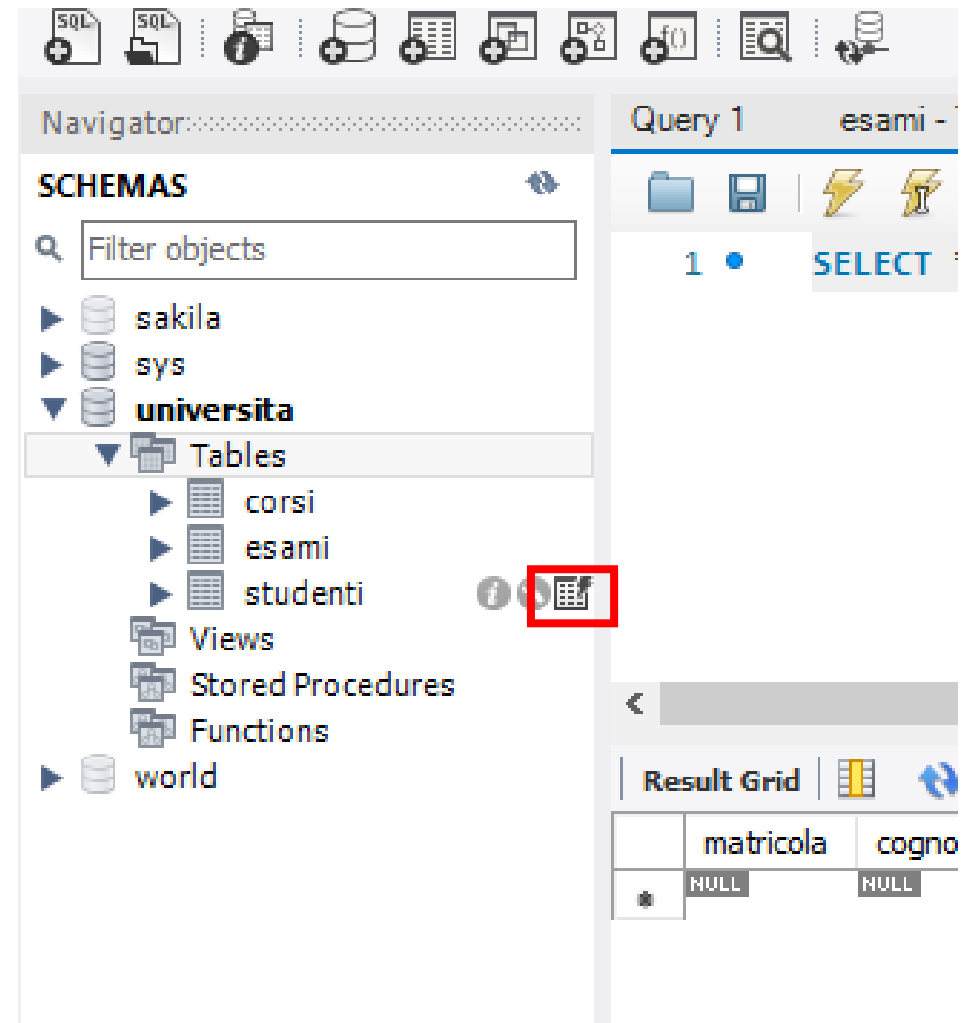
☐ Skip in SQL generation

- Foreign Key Comment -

Columns Indexes **Foreign Keys** Triggers Partitioning Options

Apply Revert

# Inserimento e modifica dei dati



# Inserimento e modifica dei dati

## Studenti

	matricola	cognome	nome	dataNascita
▶	3456	Rossi	Maria	1978-02-01
	6554	Rossi	Mario	1978-12-05
	8765	Neri	Paolo	1976-11-03
	9283	Verdi	Luisa	1979-11-12
•	NULL	NULL	NULL	NULL











## Esami

	studente	voto	corso
▶	3456	24	2
	3456	30	3
	6554	26	1
	9283	28	1
•	NULL	NULL	NULL

## Corsi

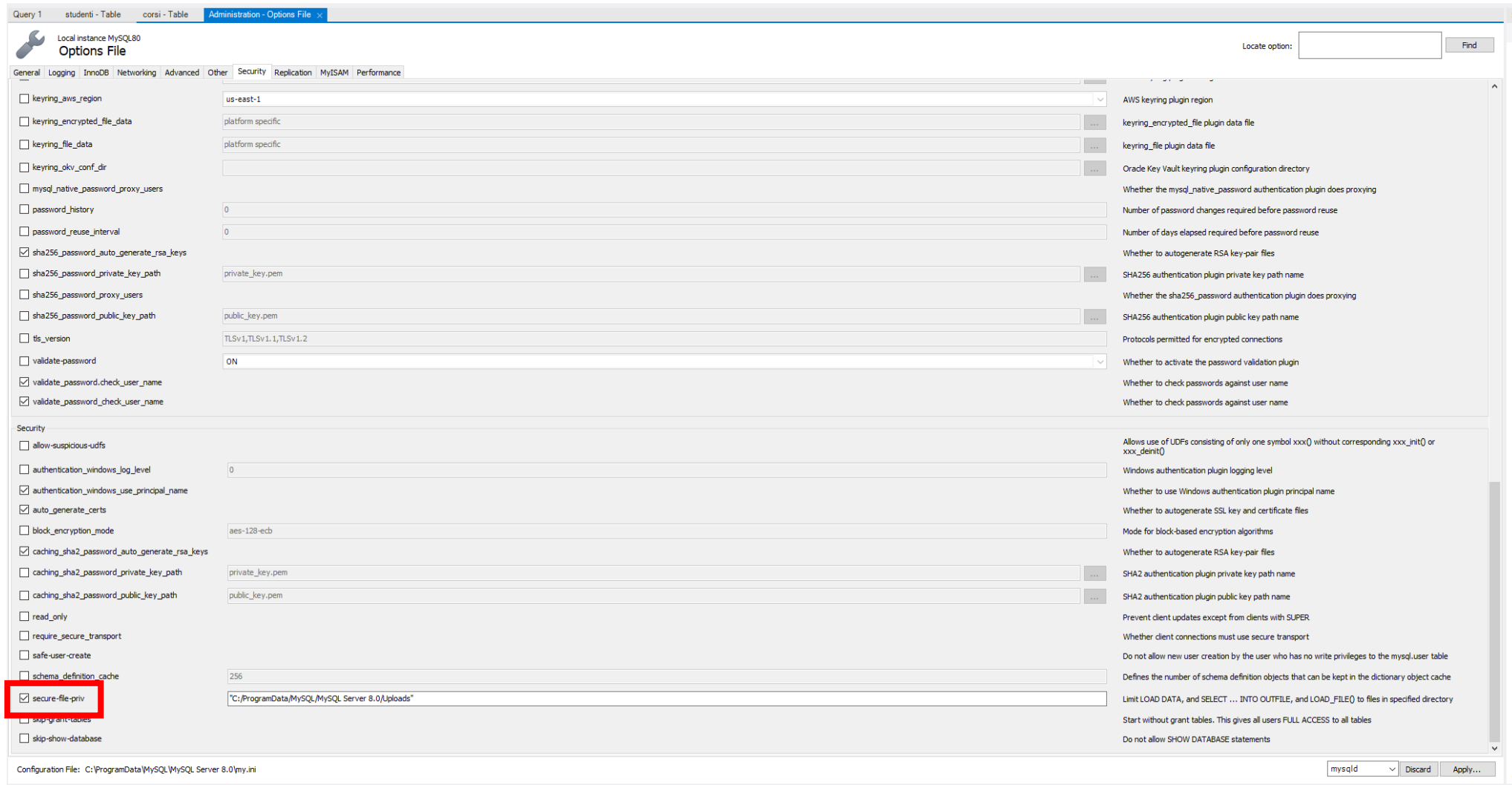
	codice	titolo	docente
▶	1	Analisi	Mario
	2	Chimica	Bruni
	3	Chimica	Verdi
•	NULL	NULL	NULL

# Inserimento e modifica dei dati

Result Grid			Filter Rows: <input type="text"/>	Edit: 			Export/Import: 		Wrap Cell Content: 
	studente	voto	corso						
	3456	24	2						
	3456	30	3						
	6554	26	1						
	9283	28	1						
	NULL	NULL	NULL						

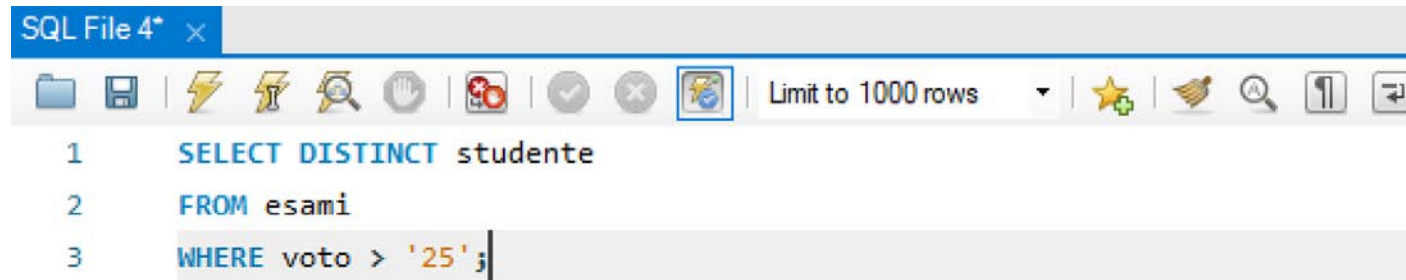


# Problema con Workbench e LOAD DATA



# Query

- In MySQL Workbench è sempre possibile creare query **FILE > NEW QUERY TAB**



- Per eseguire la query si può utilizzare il fulmine;
- Anche per effettuare script di DDL si può utilizzare la finestra «query tab».