

Databases (數據庫)

香港真光書院

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背景1 - 學校

- 南區
- 女校
- Banding 2
- 文科成績較好
- 數理成績較弱

背景2 - ICT 課程內容

- 初中電腦每星期1-2堂, 每堂40分鐘
 - S1 : 1堂(中/英文)
 - Google Docs, 3D Printing, VR, AI+資訊素養
 - S2 : 2堂(中/英文)
 - Google Form, Sites & Sheet, Microbit+STEM Project, 資訊素養
 - S3 : 1堂(英文)
 - Networking, **Databases(共佔5-6堂)** & Python Programming
- S4-6 ICT : 6-7堂(英文)
 - **Elective A Databases (+ SBA)** + (Elective B or C)

教學工具 - 經驗分享(曾考慮方案)

- MySQL Server and workbench
 - Pros: 免費, 較專業
 - Cons: 介面較複雜
- Microsoft Access
 - Pros: 介面方便, 多功能
 - Cons: 如學生在家安裝, 需付費, 及不是很多學生有電腦
- Online platform(e.g. SQLite, w3school)
 - Pros: 很多免費, 使用方便, 不用安裝
 - Cons: 需處理tables的限制(需每次匯入), 或需登入

教學工具 - 經驗分享(最後方案)

- S3 ⇒ 校本網上平台(PHP+MySQL) ⇒ XAMPP
 - 原因：學生不太擅長較複雜的介面, 會影響學習/興趣
 - 優點:
 - 可預先匯入 tables, 容易配合校本筆記內容&教學
 - 手機/平板均可方便使用, 方便平時做功課/溫習
 - 學生只需輸入SQL及按確定, 無須學習複雜的介面
 - (如學校高中ICT會選修Elective B, 可考慮這個方案)
- S4-6 ⇒ MySQL workbench ⇒ PHP+MySQL?
 - 原因：較專業, 對選修ICT的學生之後做SBA會較有利, 及這些學生對較複雜的介面都容易處理

Hong Kong True Light College

S3 CPT - Database SQL

(School based online platform)

Please input a SQL query into the following text box:

```
Select * from student
```

Submit

Reset

Show Table

The following table is displaying the result of the above query.

StudentID	Name	Sex	HKID	Class	Classno	AdmissionDate	DateOfBirth	Height	Weight	Glasses	Prefect	Address	Parent
00001	Tony Leung	M	A234239(0)	1A	15	2022-09-01	2010-05-24	1.70	70	1	0	Central	Susan
00002	May Wai	F	C369369(3)	2C	25	2021-09-01	2009-10-10	1.50	49	0	0	Wan Chai	Daisy
00003	Emily Cheung	F	A456453(6)	3B	4	2020-09-01	2008-06-24	1.66	58	0	1	Tai Wai	Penny

PHP + MySQL 注意事項(其中3項) :

1. Prevent special characters problems

⇒ Special characters “ ” ‘ ’ < > &

2. Case-sensitive problems

⇒ when using “=” or “LIKE”

3. Unable “Insert / Update / Delete...etc”

⇒ Only “Select” can be used

1. Prevent special characters problems

⇒ Special characters " ' < > &

```
61 function convert_input($data) {  
62     $data = trim($data);  
63     $data = htmlspecialchars($data);  
64     return $data;  
65 }
```

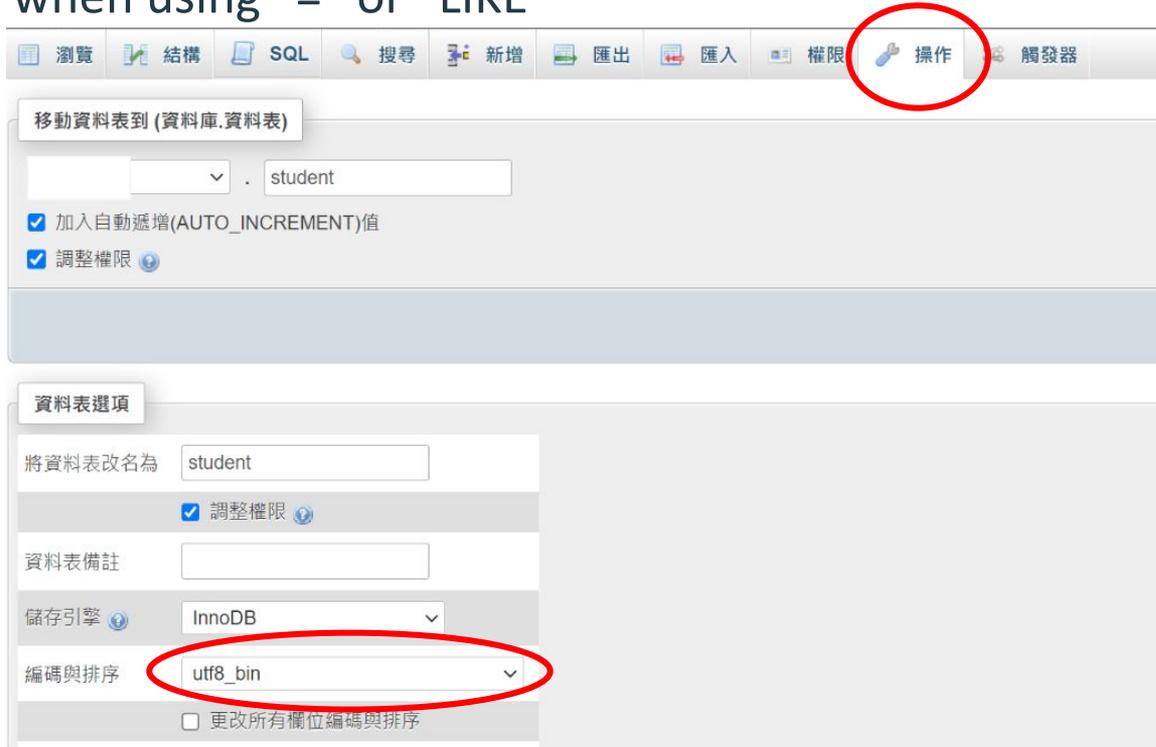
- & (ampersand) becomes &
- " (double quote) becomes "
- ' (single quote) becomes '
- < (less than) becomes <
- > (greater than) becomes >

```
89 <form method="post" action="<?php echo convert_input($_SERVER[  
    "PHP_SELF"]);?>">  
90  
91     <textarea id="comment" name="comment" rows="5" cols="80"><?php echo  
    $comment;?></textarea>  
92     <br><br>  
93
```

```
118  
119 if($comment){  
120     $sql = htmlspecialchars_decode($comment);  
121     $result = $conn->query($sql);
```

2. Case-sensitive problems (in phpMyAdmin)

⇒ when using “=” or “LIKE”



The screenshot shows the phpMyAdmin interface. The top navigation bar includes tabs for 瀏覽, 結構, SQL, 搜尋, 新增, 匯出, 匯入, 權限, 操作, and 觸發器. The '操作' (Operations) tab is highlighted with a red circle. Below the navigation bar, the '移動資料表到 (資料庫.資料表)' section shows a dropdown menu with 'student' selected. There are two checked options: '加入自動遞增(AUTO_INCREMENT)值' and '調整權限'. The '資料表選項' (Table Options) section is visible below, with the following settings: '將資料表改名為' set to 'student', '調整權限' checked, '資料表備註' empty, '儲存引擎' set to 'InnoDB', and '編碼與排序' set to 'utf8_bin' (highlighted with a red circle). There is also an unchecked option '更改所有欄位編碼與排序'.

[瀏覽](#)[結構](#)[SQL](#)[搜尋](#)[新增](#)[匯出](#)[匯入](#)[權限](#)[操作](#)[觸發器](#)[資料表結構](#)[關聯檢視](#)

#	名稱	類型	編碼與排序	屬性	空值(Null)	預設值	備註	額外資訊	動作
<input type="checkbox"/>	1 StudentID	varchar(5)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	2 Name	varchar(20)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	3 Sex	varchar(1)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	4 HKID	varchar(10)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	5 Class	varchar(2)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	6 Classno	varchar(2)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	7 AdmissionDate	date			否	無			修改 刪除 更多
<input type="checkbox"/>	8 DateOfBirth	date			否	無			修改 刪除 更多
<input type="checkbox"/>	9 Height	decimal(4,2)			否	無			修改 刪除 更多
<input type="checkbox"/>	10 Weight	int(3)			否	無			修改 刪除 更多
<input type="checkbox"/>	11 Glasses	tinyint(1)			否	無			修改 刪除 更多
<input type="checkbox"/>	12 Prefect	tinyint(1)			否	無			修改 刪除 更多
<input type="checkbox"/>	13 Address	varchar(20)	utf8_bin		否	無			修改 刪除 更多
<input type="checkbox"/>	14 Parent	varchar(20)	utf8_bin		否	無			修改 刪除 更多

(in phpMyAdmin)

3. Unable “Insert / Update / Delete...etc”

⇒ Only “Select” can be used

伺服器: MariaDB 10

資料庫 SQL 狀態 使用者帳號 匯出 匯入

全域 資料庫 更改密碼 登入資訊

編輯權限：使用者帳號

全域權限 全選

注意：MySQL 權限名稱會以英文表示。

資料	結構	管理
<input checked="" type="checkbox"/> SELECT	<input type="checkbox"/> CREATE	<input type="checkbox"/> GRANT
<input type="checkbox"/> INSERT	<input type="checkbox"/> ALTER	<input type="checkbox"/> SUPER
<input type="checkbox"/> UPDATE	<input type="checkbox"/> INDEX	<input type="checkbox"/> PROCESS
<input type="checkbox"/> DELETE	<input type="checkbox"/> DROP	<input type="checkbox"/> RELOAD
<input type="checkbox"/> FILE	<input type="checkbox"/> CREATE TEMPORARY TABLES	<input type="checkbox"/> SHUTDOWN
	<input type="checkbox"/> SHOW VIEW	<input type="checkbox"/> SHOW DATABASES
	<input type="checkbox"/> CREATE ROUTINE	<input type="checkbox"/> LOCK TABLES
	<input type="checkbox"/> ALTER ROUTINE	<input type="checkbox"/> REFERENCES
	<input type="checkbox"/> EXECUTE	<input type="checkbox"/> REPLICATION CLIENT
	<input type="checkbox"/> CREATE VIEW	<input type="checkbox"/> REPLICATION SLAVE
	<input type="checkbox"/> EVENT	<input type="checkbox"/> CREATE USER
	<input type="checkbox"/> TRIGGER	

(in phpMyAdmin)

3. Unable “Insert / Update / Delete...etc”

⇒ Only “Select” can be used

問題: 如想開放所有功能, 可如何處理?

⇒ 可考慮為每位學生開一帳號, 但便
需教他們在有需要時匯入Tables,
或提供相關Query讓他們複製&貼上

例如:

```
DROP TABLE student
```

```
CREATE TABLE student { ..... }
```

```
INSERT INTO .....
```

```
INSERT INTO .....
```

```
INSERT INTO .....
```

筆記內容1

1) SQL syntax(語法): select some particular fields from database

SELECT field name, field name ...

Determine which fields would be shown.

FROM table name;

Which table would be used?

e.g.1) Search the names of students, their class and class number.

Write down the SQL statement:

Select name, class, classno from student;

Results are as follows

name	class	classno
Tony Leung	1A	15
May Wai	2C	25
Emily Cheung	3B	4
David Wong	1A	14

Remark 1: Use the field name of the table
(e.g. class number → classno)

Remark 2: Must be used ' , ' to separate the field names. Do not use 'and'.

筆記內容2

Syntax error (語法錯誤):

Select * from student where sex=F

Please input a SQL query into the following text box:

```
Select * from student where sex=F
```

The following table is displaying the result of the above query:

"Error occur: Unknown column 'F' in 'where clause'"

Missing the double quote ""

If an error occurs, an error message will be displayed.

Logic error (邏輯錯誤):

Select * from student where sex="f"

Please input a SQL query into the following text box:

```
select * from student where sex="f"
```

The following table is displaying the result of the above query:

StudentID	Name	Sex	HKID	Class	Classno	AdmissionDate	DateOfBirth	Height	Weight	Glasses	Prefect	Address	Parent
-----------	------	-----	------	-------	---------	---------------	-------------	--------	--------	---------	---------	---------	--------

The data is case-sensitive.

"f" is not equal to "F"

If no record is found, it may

筆記內容3

2. Search the name of class 1A students.

Write down the SQL statement:

Select name from student
where class="1A";

Results are as follows:

name
Tony Leung
David Wong
Peter Wong

5. Search the name, class and class number of the students who wear glasses.

Write down the SQL statement:

Select name, class, classno from student
where glasses=True;

Wear glasses = True
No wear glasses = False

Results are as follows:

name	class	classno
Tony Leung	1A	15
David Wong	1A	14
Baby Chan	2A	5
Peter Leung	3B	15
James Chan	2B	29
Peter Wong	1A	16
Victoria Lee	5C	17

筆記內容4

6. Display the names, classes, admission dates and dates of birth of Form 2 students whose admission date is **not** on “2021-09-01” or who born **not later** than (不遲於) “2009-08-31”. Give the results in ascending order by class and descending order by the date of birth. In addition, complete the results of the following table.

Write down the SQL statement:

```
SELECT Name, Class, AdmissionDate, DateOfBirth FROM Student
WHERE (AdmissionDate <> "2021-09-01" OR DateOfBirth <= "2009-08-31" )
AND Class LIKE "2%"
ORDER BY Class ASC, DateOfbirth DESC
```

Write down the results in the following table:

<http://live.hkctlc.edu.hk:8088/>





Integrated development environment tools

XAMPP



- Free and open-source
- Apache HTTP Server
- MariaDB Database Server
- PHP interpreter
- PHPMyAdmin Web-based administration tool
- One click installation

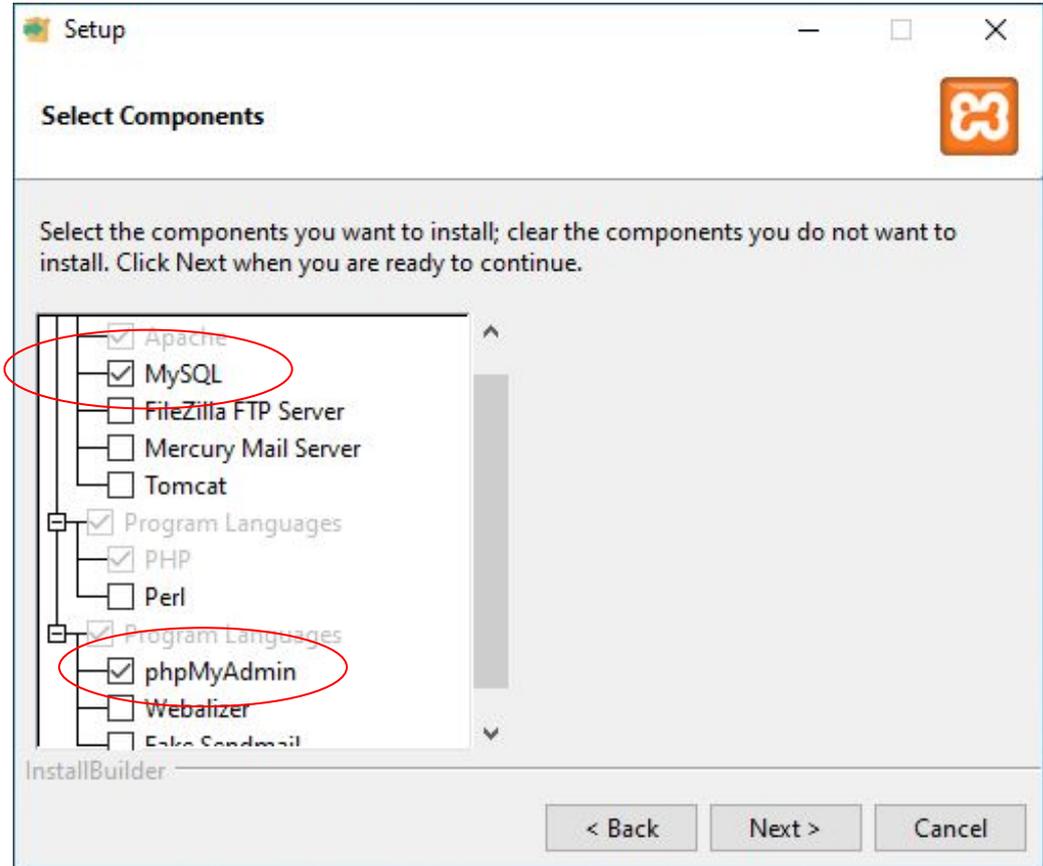
XAMPP - Installation environment



- Desktop PC, Server, Mac
- Windows, Windows Server, Linux, OS X

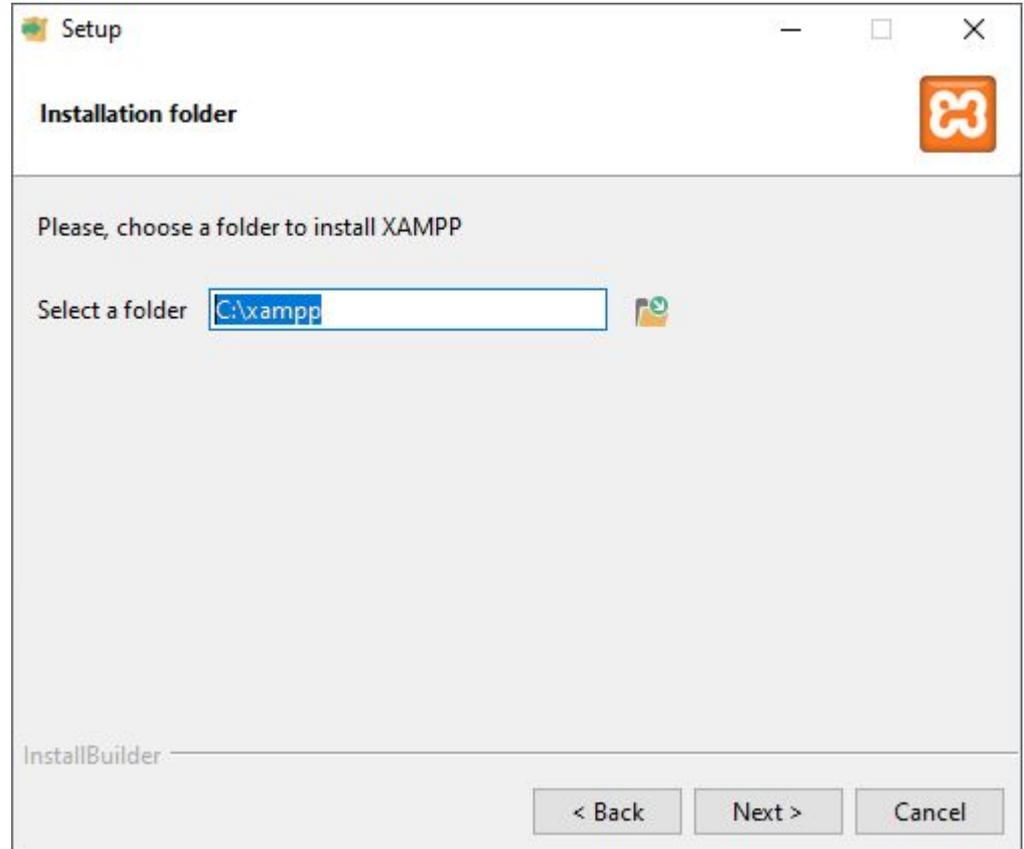
XAMPP - Setup

- Only select MySQL and phpMyAdmin



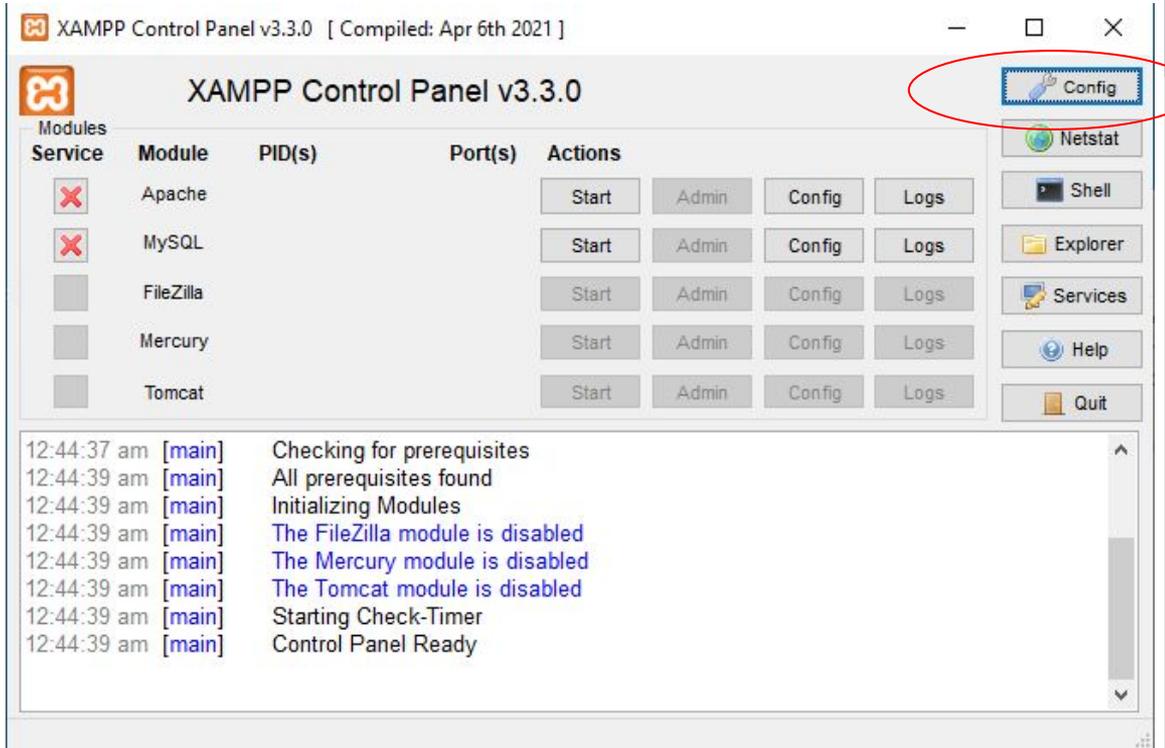
XAMPP - Setup

- Using the default installation path



XAMPP - Post setup configuration

- Control Panel automatically open after setup.
- Click “Config”



XAMPP Control Panel v3.3.0 [Compiled: Apr 6th 2021]

XAMPP Control Panel v3.3.0

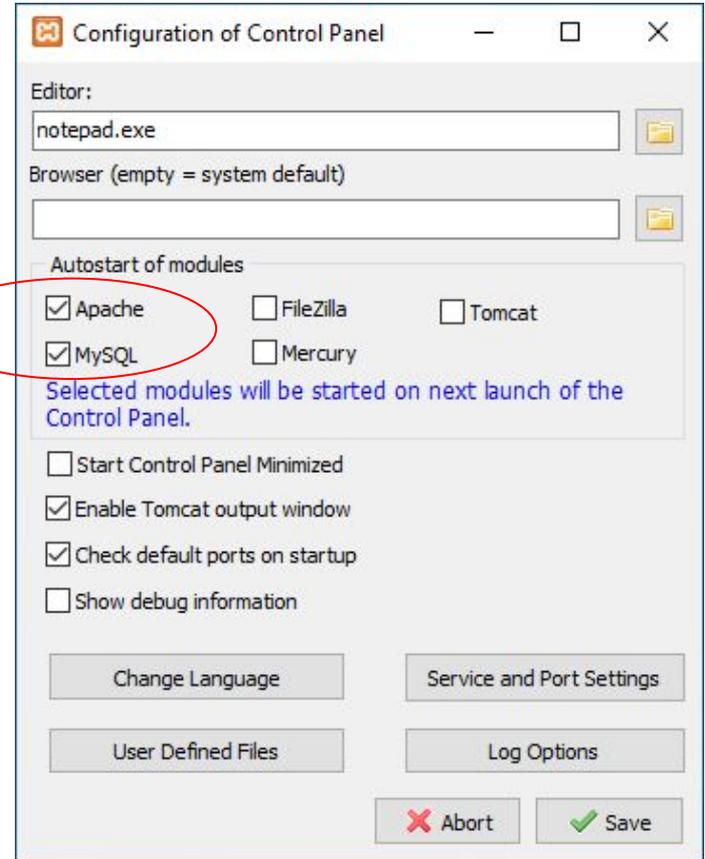
Service	Module	PID(s)	Port(s)	Actions
	Apache			Start Admin Config Logs
	MySQL			Start Admin Config Logs
	FileZilla			Start Admin Config Logs
	Mercury			Start Admin Config Logs
	Tomcat			Start Admin Config Logs

Log window:

```
12:44:37 am [main] Checking for prerequisites
12:44:39 am [main] All prerequisites found
12:44:39 am [main] Initializing Modules
12:44:39 am [main] The FileZilla module is disabled
12:44:39 am [main] The Mercury module is disabled
12:44:39 am [main] The Tomcat module is disabled
12:44:39 am [main] Starting Check-Timer
12:44:39 am [main] Control Panel Ready
```

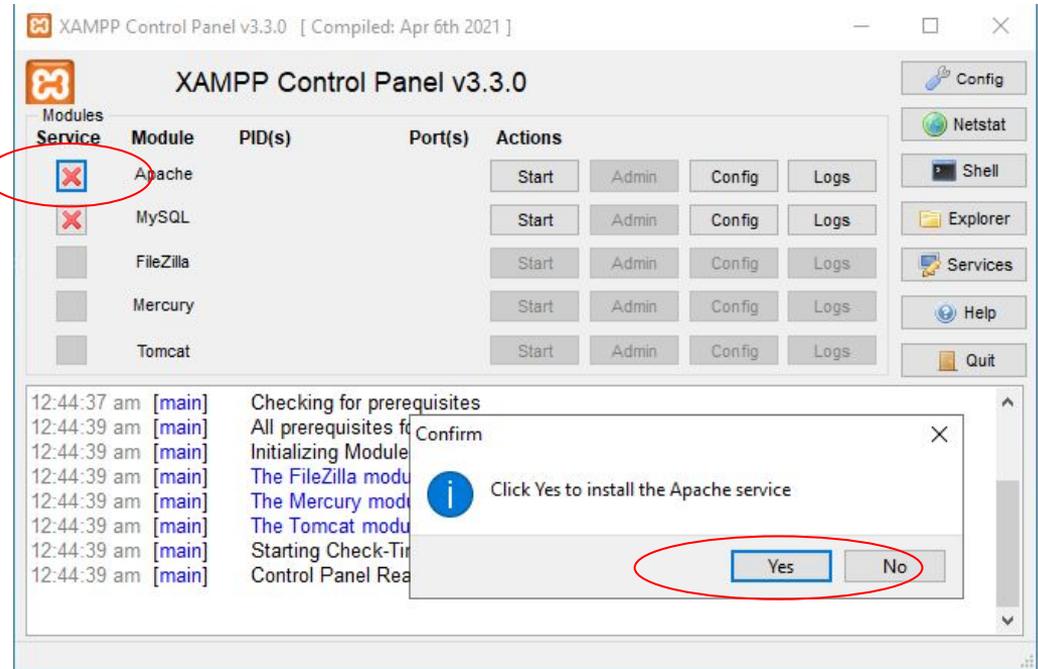
XAMPP - Post setup configuration

- Select “Apache” and “MySQL”, then “Save”



XAMPP - Post setup configuration

- Select the service “Apache”, then Click “Yes”.



The screenshot displays the XAMPP Control Panel v3.3.0 interface. The 'Modules' section is active, showing a table of services. The 'Apache' service is selected, indicated by a red 'X' icon in the 'Service' column. A confirmation dialog box is overlaid on the interface, asking 'Click Yes to install the Apache service'. The 'Yes' button in the dialog is circled in red.

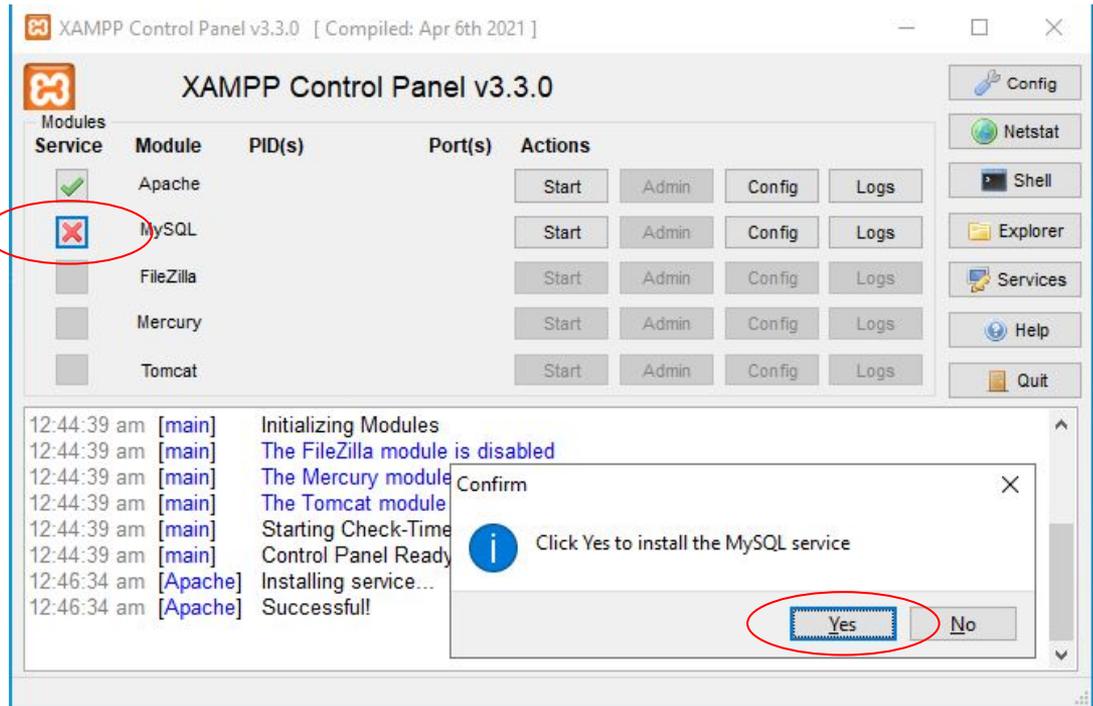
Service	Module	PID(s)	Port(s)	Actions
<input checked="" type="checkbox"/>	Apache			Start Admin Config Logs
<input checked="" type="checkbox"/>	MySQL			Start Admin Config Logs
<input type="checkbox"/>	FileZilla			Start Admin Config Logs
<input type="checkbox"/>	Mercury			Start Admin Config Logs
<input type="checkbox"/>	Tomcat			Start Admin Config Logs

12:44:37 am [main] Checking for prerequisites
12:44:39 am [main] All prerequisites for
12:44:39 am [main] Initializing Module
12:44:39 am [main] The FileZilla modu
12:44:39 am [main] The Mercury modu
12:44:39 am [main] The Tomcat modu
12:44:39 am [main] Starting Check-Tir
12:44:39 am [main] Control Panel Rea

Confirm
Click Yes to install the Apache service
Yes No

XAMPP - Post setup configuration

- Select the service “MySQL”, then Click “Yes”.



XAMPP - Post setup configuration

- Apache and MySQL service started

XAMPP Control Panel v3.3.0 [Compiled: Apr 6th 2021]

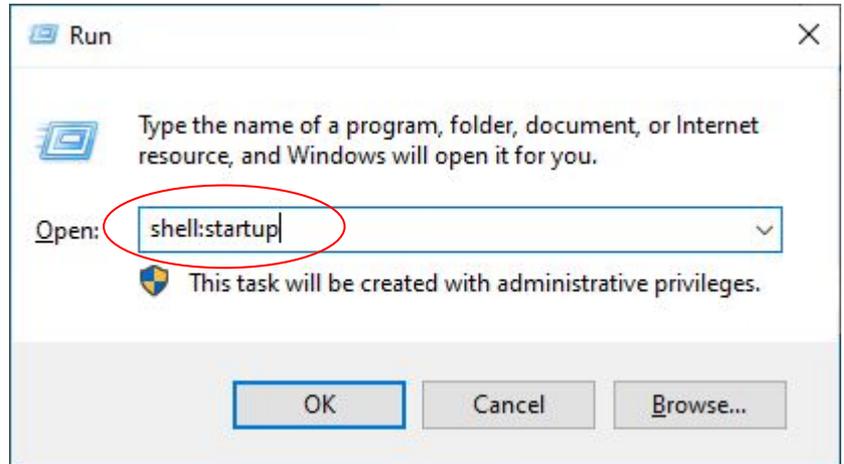
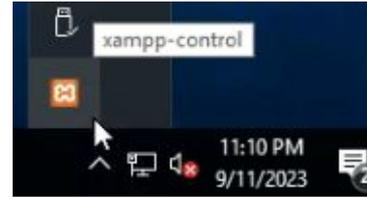
XAMPP Control Panel v3.3.0

Service	Module	PID(s)	Port(s)	Actions
<input checked="" type="checkbox"/>	Apache	5820	80, 443	Stop Admin Config Logs
<input checked="" type="checkbox"/>	MySQL	7272	3306	Stop Admin Config Logs
<input type="checkbox"/>	FileZilla			Start Admin Config Logs
<input type="checkbox"/>	Mercury			Start Admin Config Logs
<input type="checkbox"/>	Tomcat			Start Admin Config Logs

12:48:25 am [main] Initializing Control Panel
12:48:25 am [main] Windows Version: 64-bit
12:48:25 am [main] XAMPP Version: 8.0.28
12:48:25 am [main] Control Panel Version: 3.3.0 [Compiled: Apr 6th 2021]
12:48:25 am [main] Running with Administrator rights - good!
12:48:25 am [main] XAMPP Installation Directory: "c:\xampp\
12:48:25 am [main] Checking for prerequisites
12:48:25 am [main] All prerequisites found
12:48:25 am [main] Initializing Modules
12:48:25 am [main] The FileZilla module is disabled

XAMPP - Post setup configuration

- Configure control panel open automatically after system reboot/restart
- Press: Win  - R
- Type “shell:startup”



XAMPP - Post setup configuration

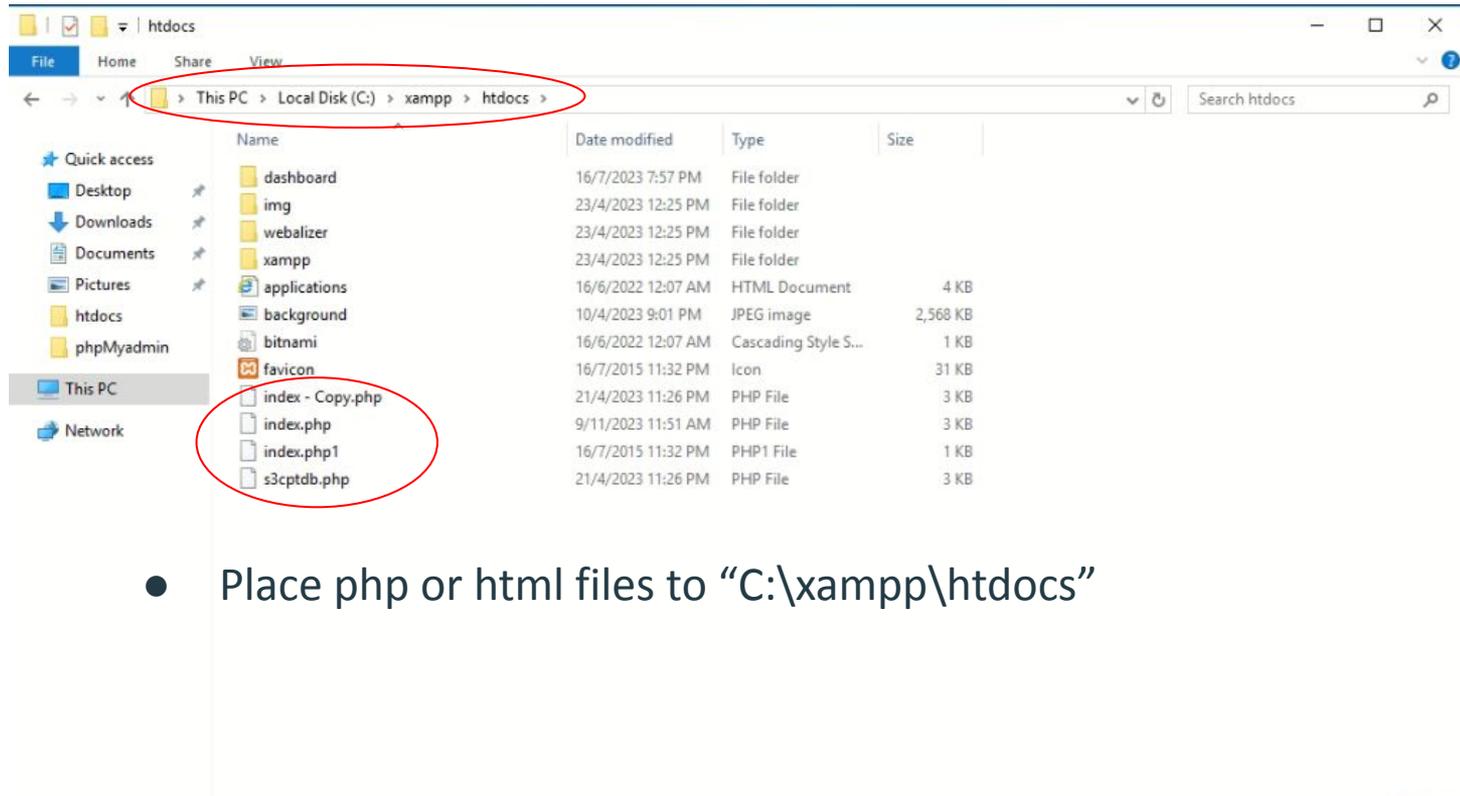
The image shows two side-by-side Windows File Explorer windows. The left window displays the 'Startup' folder, where a shortcut named 'xampp-control - Shortcut' is circled in red. The right window displays the 'xampp' folder on the local disk, where the 'xampp-control' application file is also circled in red. A red arrow points from the circled file in the right window to the circled shortcut in the left window.

● Create a shortcut of “xampp-control” to “Startup” folder

Name	Date modified	Type	Size
xampp-control - Shortcut	9/11/2023 12:54 am	Shortcut	2 KB

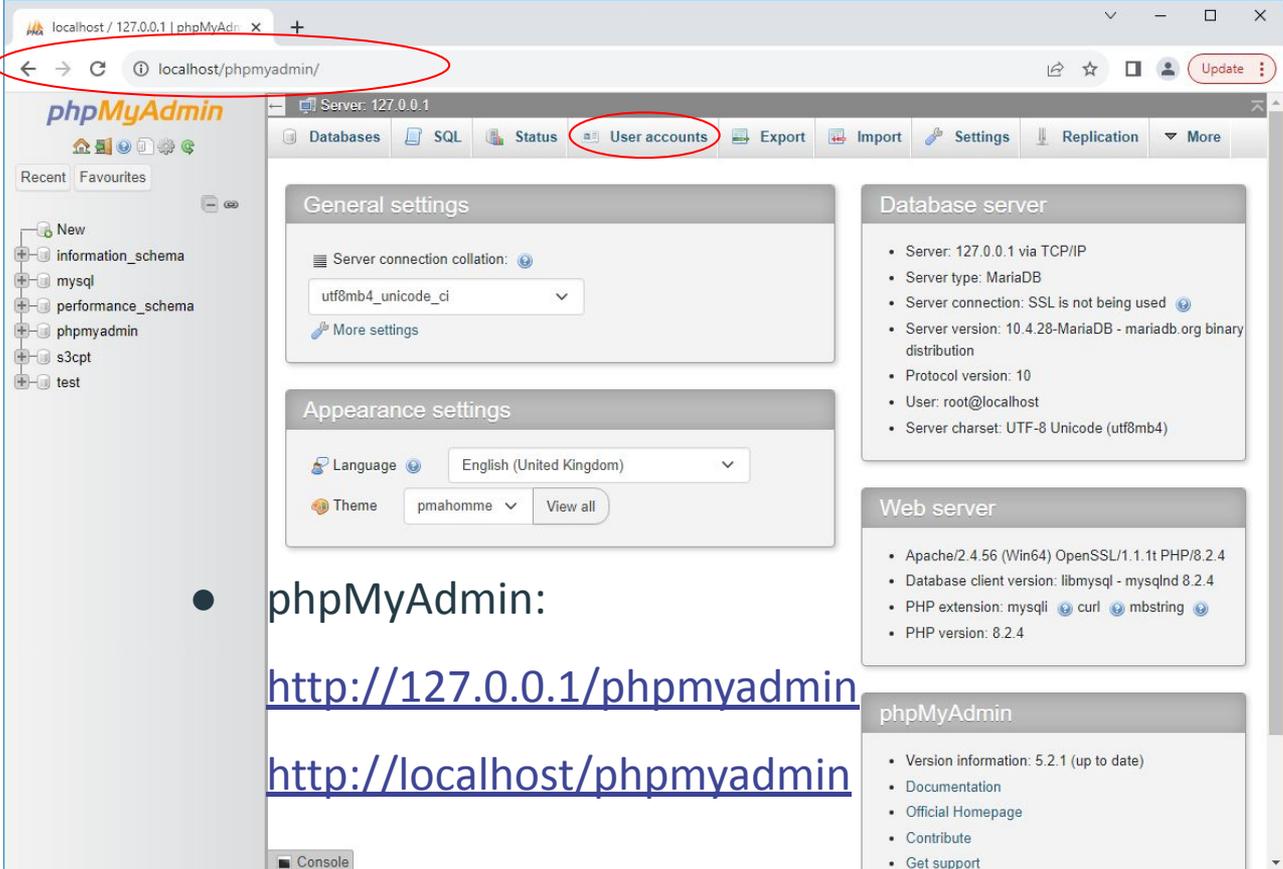
Name	Date modified	Type
filezilla_start	7/6/2013 4:15 am	Windows E
filezilla_stop	7/6/2013 4:15 am	Windows E
killprocess	15/6/2022 9:07 am	Windows E
mercury_start	7/6/2013 4:15 am	Windows E
mercury_stop	7/6/2013 4:15 am	Windows E
mysql_start	3/6/2019 4:39 am	Windows E
mysql_stop	1/10/2019 12:13 am	Windows E
passwords	13/3/2017 4:04 am	Text Docur
properties	9/11/2023 12:41 am	Configurat
readme_de	6/4/2023 2:24 am	Text Docur
readme_en	6/4/2023 2:24 am	Text Docur
service	30/3/2013 5:29 am	Application
setup_xampp	30/3/2013 5:29 am	Windows E
test_php	29/11/2020 5:38 am	Windows E
uninstall.dat	9/11/2023 12:42 am	DAT File
uninstall	9/11/2023 12:42 am	Application
xampp_shell	9/11/2023 12:40 am	Windows E
xampp_start	30/3/2013 5:29 am	Application
xampp_stop	30/3/2013 5:29 am	Application
xampp-control	6/4/2021 4:38 am	Application
xampp-control	9/11/2023 12:49 am	Configurat
xampp-control	9/11/2023 12:49 am	Text Docur

XAMPP - Post setup configuration



- Place php or html files to “C:\xampp\htdocs”

XAMPP - Create a user account on phpMyAdmin



The screenshot displays the phpMyAdmin web interface in a browser window. The browser's address bar shows the URL `localhost/phpmyadmin/`, which is circled in red. The phpMyAdmin navigation menu at the top includes 'Databases', 'SQL', 'Status', 'User accounts' (circled in red), 'Export', 'Import', 'Settings', 'Replication', and 'More'. The main content area is divided into several sections: 'General settings' (Server connection collation: utf8mb4_unicode_ci), 'Appearance settings' (Language: English (United Kingdom), Theme: pmahomme), 'Database server' (Server: 127.0.0.1 via TCP/IP, Server type: MariaDB, Server version: 10.4.28-MariaDB, User: root@localhost), 'Web server' (Apache/2.4.56, Database client version: libmysql - mysqlnd 8.2.4, PHP extension: mysqli, PHP version: 8.2.4), and 'phpMyAdmin' (Version information: 5.2.1 (up to date), Documentation, Official Homepage, Contribute, Get support). A sidebar on the left shows a tree view of databases including 'information_schema', 'mysql', 'performance_schema', 'phpmyadmin', 's3cpt', and 'test'. A 'Console' tab is visible at the bottom left.

- phpMyAdmin:
<http://127.0.0.1/phpmyadmin>
<http://localhost/phpmyadmin>

XAMPP - Create a user account on phpMyAdmin

- Create a user account “public” with SELECT and SHOW VIEW privileges for web access users

The screenshot shows the phpMyAdmin interface for a MySQL server on localhost. The 'User accounts overview' page is displayed, showing a table of existing users. The 'public' user is highlighted with a red box. Below the table, the 'Add user account' button is circled in red.

User name	Host name	Password	Global privileges	User group	Grant	Action
<input type="checkbox"/> Any	%	No	USAGE	No		Edit privileges Export Lock
<input type="checkbox"/> pma	localhost	No	USAGE	No		Edit privileges Export Lock
<input type="checkbox"/> public	%	Yes	SELECT, SHOW VIEW	No		Edit privileges Export Lock
<input type="checkbox"/> root	127.0.0.1	No	ALL PRIVILEGES	Yes		Edit privileges Export Lock
<input type="checkbox"/> root	:::1	No	ALL PRIVILEGES	Yes		Edit privileges Export Lock
<input type="checkbox"/> root	localhost	Yes	ALL PRIVILEGES	Yes		Edit privileges Export Lock

Check all With selected: Export

New

-
-

Revoke all active privileges from the users and delete them afterwards.

Drop the databases that have the same names as the users.

Go

XAMPP - Create a user account on phpMyAdmin

The screenshot shows the phpMyAdmin interface for adding a new user account. The browser address bar shows the URL: localhost/phpmyadmin/index.php?route=/server/privileges&adduser=1. The page title is "Server: 127.0.0.1". The main navigation menu includes "Databases", "SQL", "Status", "User accounts", "Export", "Import", "Settings", "Replication", and "More". The "User accounts" menu item is selected.

The "Add user account" form is displayed with the following fields and annotations:

- Login Information:**
 - User name:** A dropdown menu with a red circle around it, showing the selected value "public".
 - Host name:** A dropdown menu set to "Any host" and a text field containing "%".
 - Password:** A text field with a red circle around it, containing ten asterisks "*****". A "Strength:" indicator is visible to the right.
 - Re-type:** A text field for re-entering the password.
 - Authentication plugin:** A dropdown menu set to "Native MySQL authentication".
 - Generate password:** A button labeled "Generate" and an empty text field.
- Database for user account:**
 - Create database with same name and grant all privileges.
 - Grant all privileges on wildcard name (username_%).
- Global privileges:** Check all

A large red arrow points downwards from the "Generate password" field, with the text "Page down" written in red next to it.

At the bottom of the page, there is a "Console" tab.

XAMPP - Create a user account on phpMyAdmin

- Select the necessary query functions
- Example: SELECT

Global privileges Check all

Note: MySQL privilege names are expressed in English.

SELECT
 INSERT
 UPDATE
 DELETE
 FILE

CREATE
 ALTER
 INDEX
 DROP
 CREATE TEMPORARY TABLES
 SHOW VIEW
 CREATE ROUTINE
 ALTER ROUTINE
 EXECUTE
 CREATE VIEW
 EVENT
 TRIGGER

Administration

GRANT
 SUPER
 PROCESS
 RELOAD
 SHUTDOWN
 SHOW DATABASES
 LOCK TABLES
 REFERENCES
 REPLICATION CLIENT
 REPLICATION SLAVE
 CREATE USER

Resource limits

Note: Setting these options to 0 (zero) removes the limit.

Console

Page down

XAMPP - Create a user account on phpMyAdmin

The screenshot shows the phpMyAdmin interface for creating a user account. The browser address bar shows the URL: localhost/phpmyadmin/index.php?route=/server/privileges&adduser=1. The main navigation menu includes 'Databases', 'SQL', 'Status', 'User accounts', 'Export', 'Import', 'Settings', 'Replication', and 'More'. The left sidebar shows a tree view of databases: 'New', 'information_schema', 'mysql', 'performance_schema', 'phpmyadmin', 's3cpt', and 'test'. The main content area is titled 'CREATE USER' and contains several sections: 'Resource limits' with a note 'Setting these options to 0 (zero) removes the limit.' and four input fields for 'MAX QUERIES PER HOUR', 'MAX UPDATES PER HOUR', 'MAX CONNECTIONS PER HOUR', and 'MAX USER_CONNECTIONS', all set to '0'. Below this is the 'SSL' section with radio buttons for 'REQUIRE NONE' (selected), 'REQUIRE SSL', 'REQUIRE X509', and 'SPECIFIED', followed by three input fields for 'REQUIRE CIPHER', 'REQUIRE ISSUER', and 'REQUIRE SUBJECT'. At the bottom right, a 'Go' button is circled in red.

MySQL Community Server



- Open-source database system
- Popular RDBMS developed by Oracle
- Good Performance
- Supported by a huge community of open-source developers
- Used by many famous IT company

MySQL Workbench



- MySQL IDE tool
- GUI/CLI SQL development
- Visual modelling
- Database/User administration

The screenshot displays the MySQL Workbench interface for a server named 's201611989'. The interface is divided into several sections:

- MANAGEMENT:** Includes links for Server Status, Client Connections, Users and Privileges, Status and System Variables, Data Export, and Data Import/Restore.
- INSTANCE:** Includes links for Startup / Shutdown, Server Logs, and Options File.
- PERFORMANCE:** Includes links for Dashboard, Performance Reports, and Performance Schema Setup.
- Server Information:** Shows connection name 's201611989', host 'mysql', socket 'HySQL', port '3306', version '8.0.29 (MySQL Community Server - GPL)', and running since 'Wed Nov 8 20:50:13 2023 (1 day 1:38)'. A 'Refresh' button is present.
- Available Server Features:** A list of features with their status (On/Off/n/a):
 - Performance Schema: On
 - Thread Pool: n/a
 - Memcached Plugin: n/a
 - Semisync Replication Plugin: n/a
 - SSL Availability: On
 - Windows Authentication: Off
 - Password Validation: n/a
 - Audit Log: n/a
 - Firewall: n/a
 - Firewall Trace: n/a
- Server Directories:** Lists various directories and their paths, such as Base Directory, Data Directory, and Plugin Directory.
- Replica:** Shows 'Insufficient privileges to view replica status'.
- Authentication:** A section for managing authentication settings.
- Performance Dashboard:** A grid of charts showing metrics like Traffic (5.08 KB/s), Key Efficiency (0.0%), Selects per Second (0), InnoDB Buffer Usage (52.1%), InnoDB Reads per Second (0), and InnoDB Writes per Second (0).
- Output:** A section for viewing action output and messages.

Advantages of Using MySQL Server and Workbench

- Individual user account and database for each student
- Can only edit their database(s) and table(s)
- Administrators/teachers can access all students databases and tables

MySQL - Installation environment



- Standalone PC: Windows, Linux, macOS etc
- Sever: Dedicated/shared server: Windows Server, Linux etc
- Client PC: Windows, Linux, macOS etc
- RDBMS Software: MySQL Installer 8.0.35 (latest version)(Including MySQL Community Server, MySQL Workbench)

Download MySQL Installer

MySQL Community Downloads

<https://dev.mysql.com/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

Download MySQL Installer

MySQL Community Server 8.0.35

Select Version:

8.0.35

Select Operating System:

Microsoft Windows

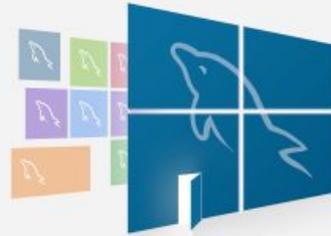
Recommended Download:

MySQL Installer for Windows

**All MySQL Products. For All Windows Platforms.
In One Package.**

Starting with MySQL 5.6 the MySQL Installer package replaces the standalone MSI packages.

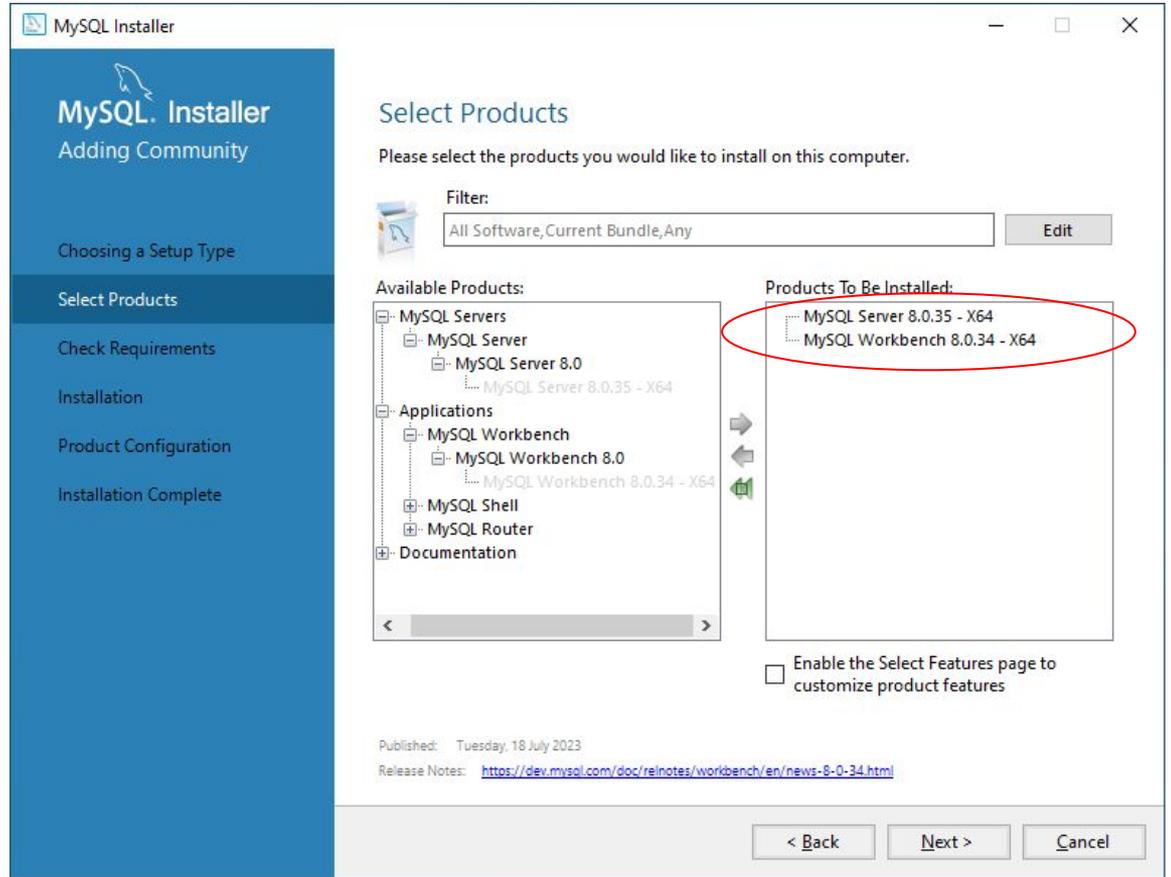
Windows (x86, 32 & 64-bit), MySQL Installer MSI



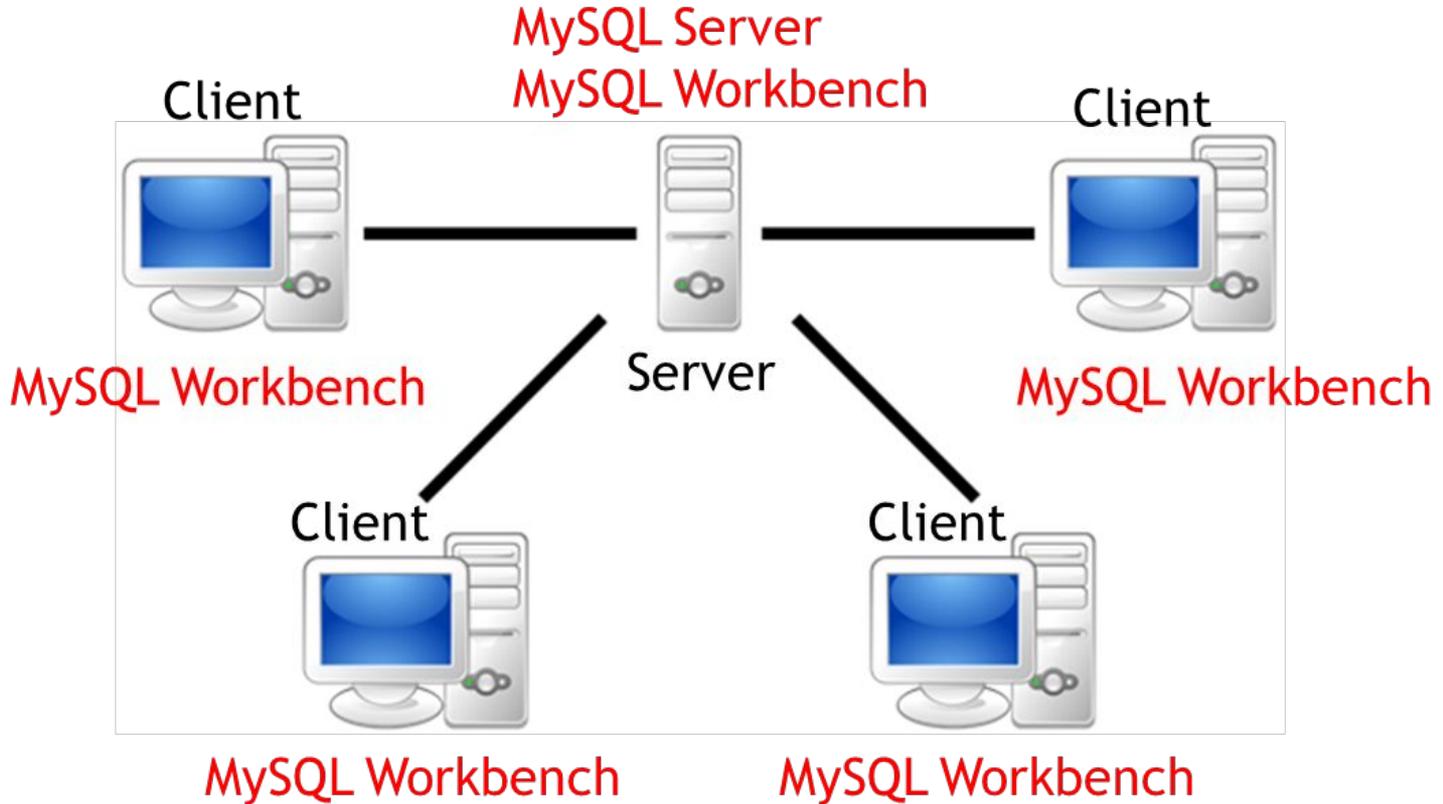
[Go to Download Page >](#)

Execute MySQL Installer

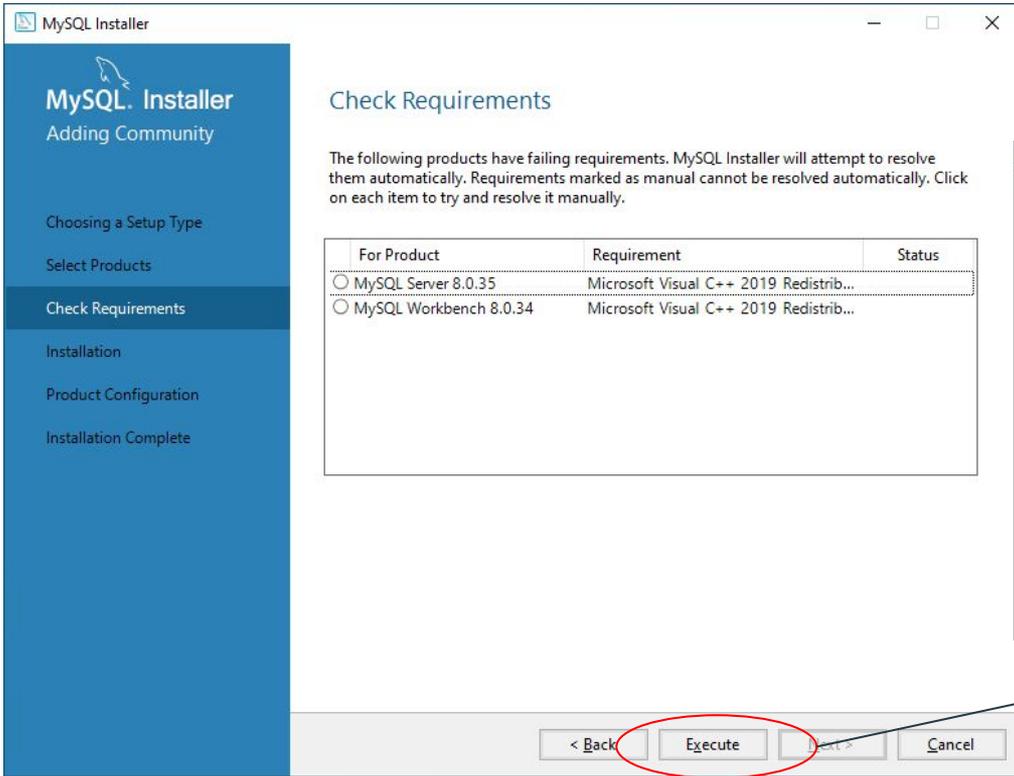
- Standalone PC/Server
 - Server
 - Workbench
- Client PC
 - Workbench



Client Server model



Required C++ runtime package



MySQL Installer

MySQL. Installer
Adding Community

Choosing a Setup Type

Select Products

Check Requirements

Installation

Product Configuration

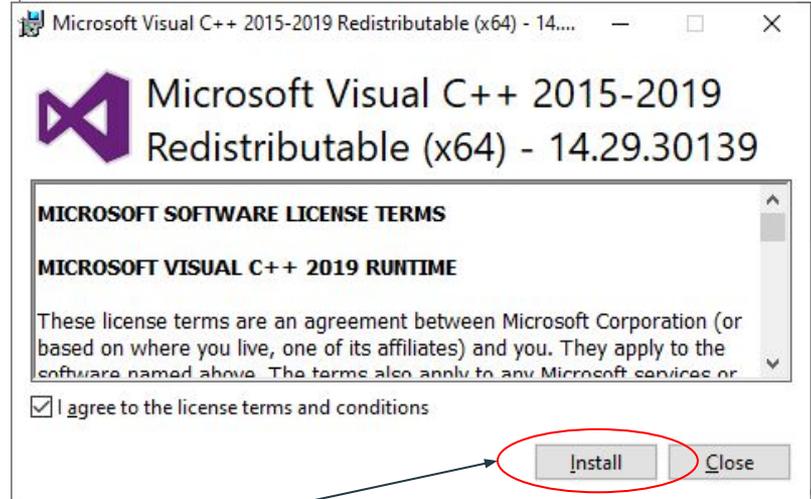
Installation Complete

Check Requirements

The following products have failing requirements. MySQL Installer will attempt to resolve them automatically. Requirements marked as manual cannot be resolved automatically. Click on each item to try and resolve it manually.

For Product	Requirement	Status
<input type="radio"/> MySQL Server 8.0.35	Microsoft Visual C++ 2019 Redistrib...	
<input type="radio"/> MySQL Workbench 8.0.34	Microsoft Visual C++ 2019 Redistrib...	

< Back **Execute** Next > Cancel



Microsoft Visual C++ 2015-2019 Redistributable (x64) - 14.29.30139

Microsoft Visual C++ 2015-2019 Redistributable (x64) - 14.29.30139

MICROSOFT SOFTWARE LICENSE TERMS

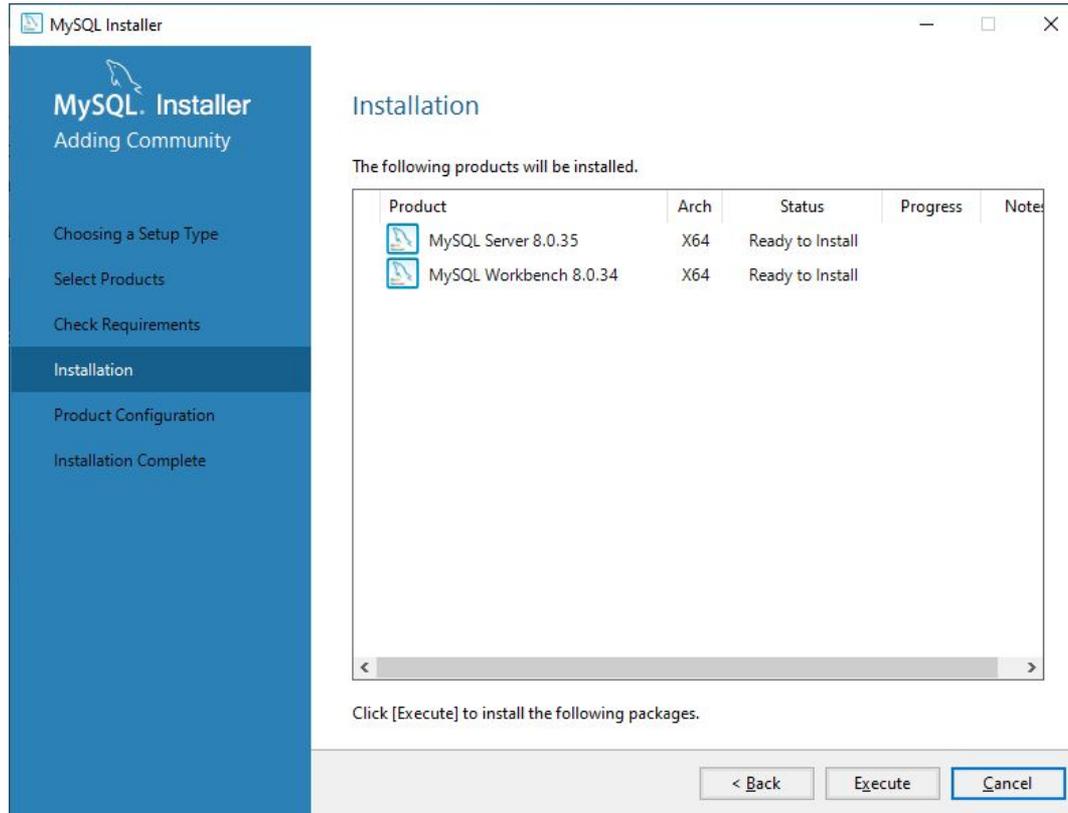
MICROSOFT VISUAL C++ 2019 RUNTIME

These license terms are an agreement between Microsoft Corporation (or based on where you live, one of its affiliates) and you. They apply to the software named above. The terms also apply to any Microsoft services or

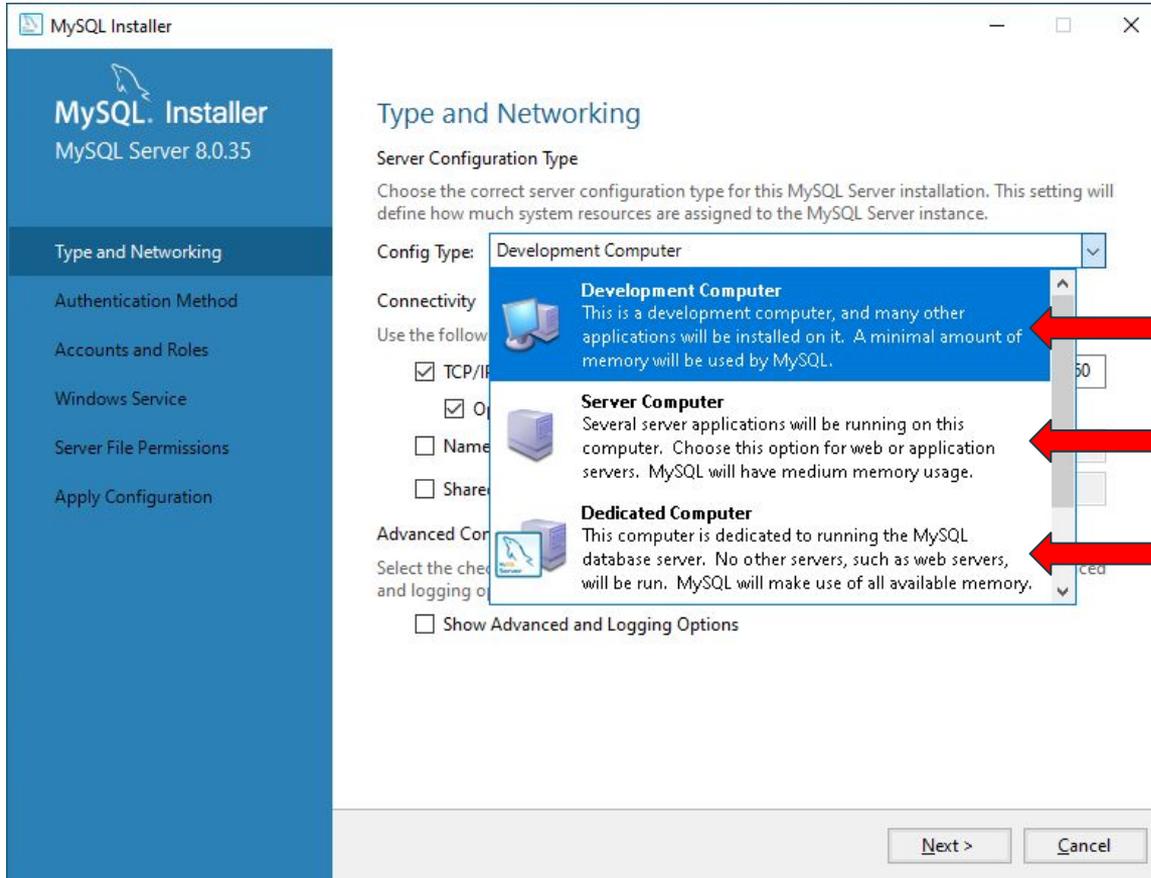
I agree to the license terms and conditions

Install Close

Ready to install



Environment type



Standalone PC

Shared Server

Dedicated Server

MySQL Server configuration

The screenshot shows the MySQL Installer window for MySQL Server 8.0.35. The left sidebar contains the following navigation items: MySQL Installer, MySQL Server 8.0.35, Type and Networking (selected), Authentication Method, Accounts and Roles, Windows Service, Server File Permissions, and Apply Configuration. The main content area is titled 'Type and Networking' and includes the following sections:

- Server Configuration Type:** A dropdown menu labeled 'Config Type:' is set to 'Dedicated Computer'. This dropdown is circled in red.
- Connectivity:** A section with the instruction 'Use the following controls to select how you would like to connect to this server.' It contains:
 - TCP/IP: A text box labeled 'Port:' contains the value '3306'. This text box is circled in red.
 - Open Windows Firewall ports for network access
 - Named Pipe: Pipe Name: MYSQL
 - Shared Memory: Memory Name: MYSQL
- Advanced Configuration:** A section with the instruction 'Select the check box below to get additional configuration pages where you can set advanced and logging options for this server instance.' It contains:
 - Show Advanced and Logging Options

At the bottom of the window are 'Next >' and 'Cancel' buttons.

Environment type

Registered port

MySQL Server configuration

- Use the default setting

MySQL Installer

MySQL. Installer
MySQL Server 8.0.35

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

MySQL Server configuration

- Create and remember the “root” password

The screenshot shows the MySQL Installer window for MySQL Server 8.0.35. The left sidebar contains a list of configuration steps: Type and Networking, Authentication Method, Accounts and Roles (selected), Windows Service, Server File Permissions, and Apply Configuration. The main area is titled 'Accounts and Roles' and contains the following sections:

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.

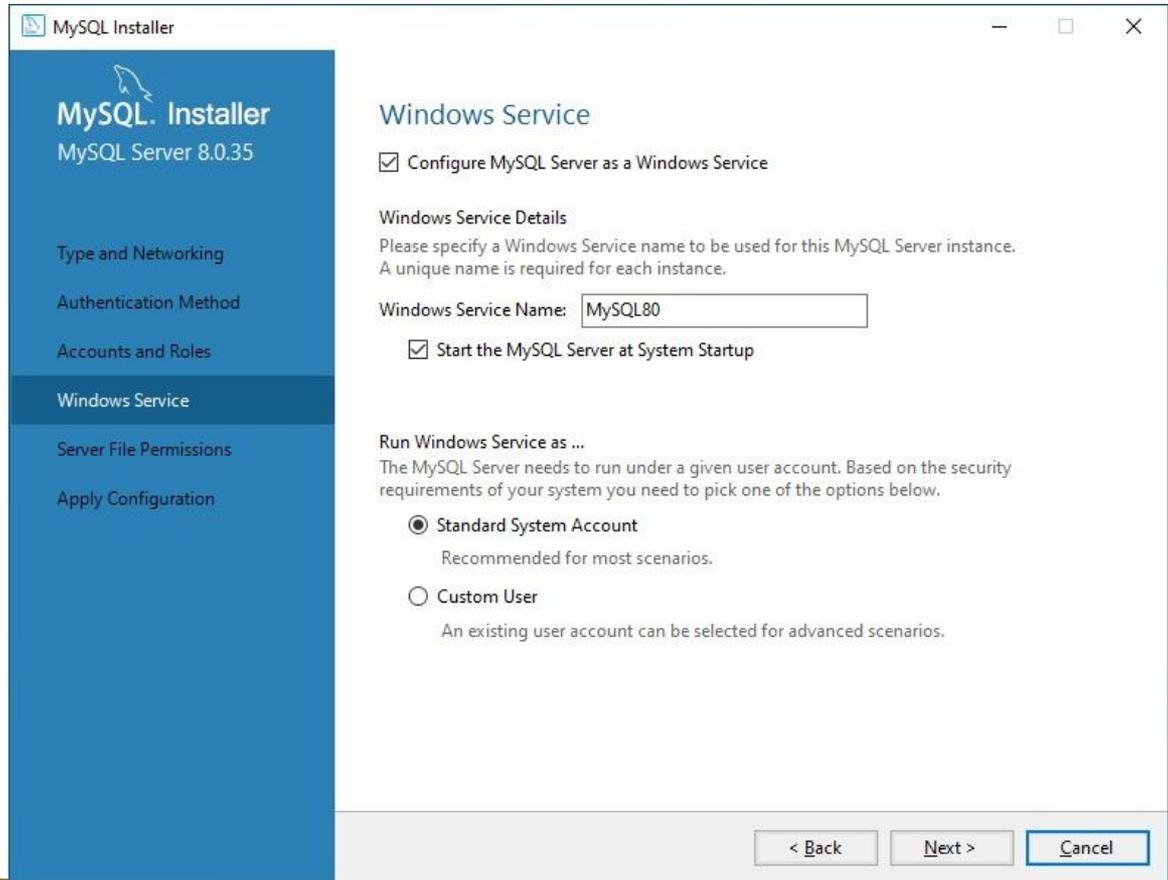
MySQL User Name	Host	User Role
-----------------	------	-----------

Buttons: Add User, Edit User, Delete

Navigation: < Back, Next >, Cancel

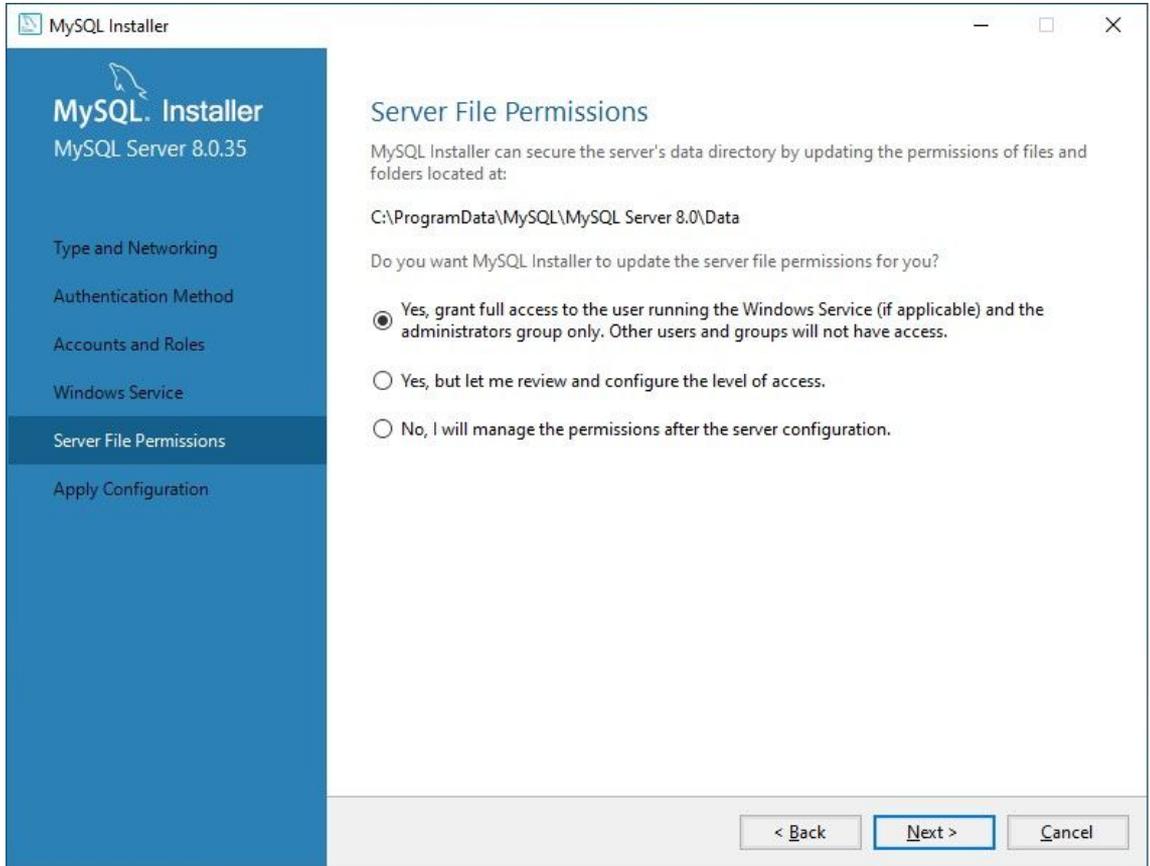
MySQL Server configuration

- Use the default setting for the windows service and system startup automatically



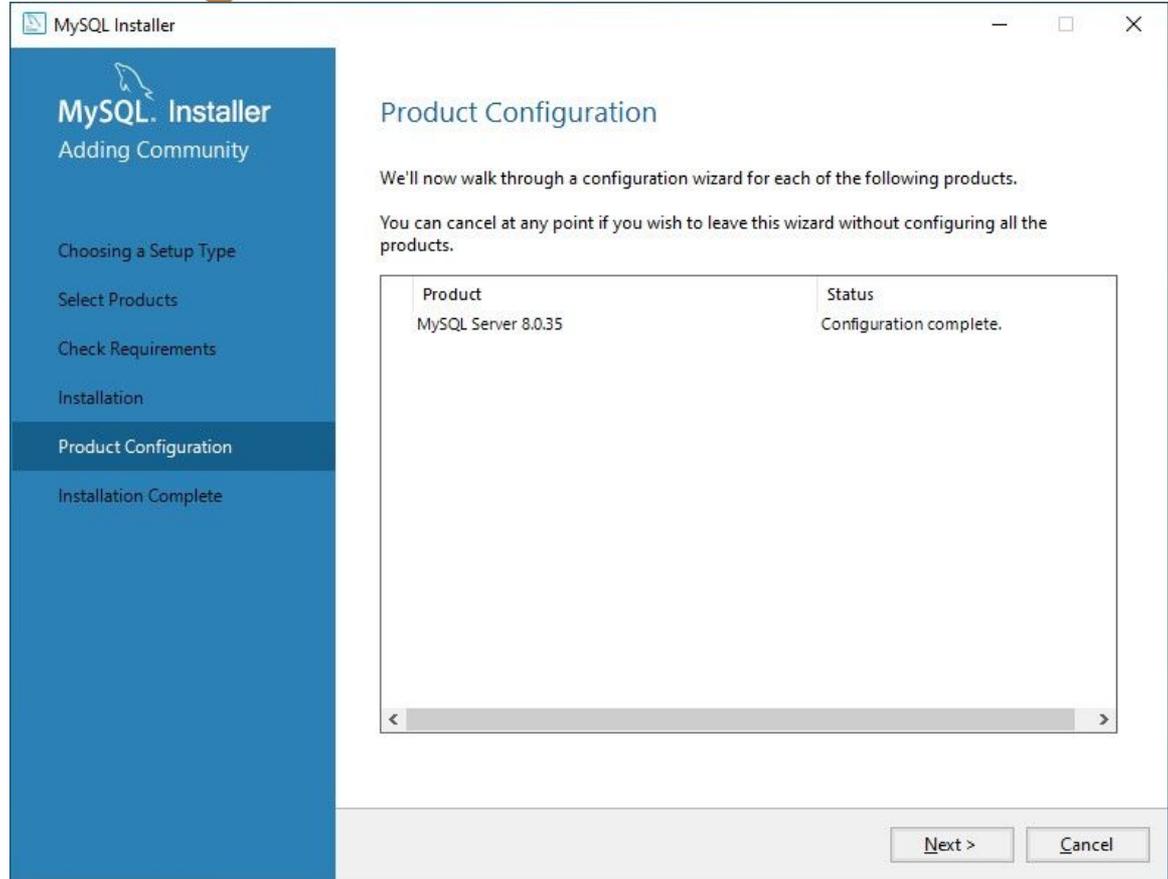
MySQL Server configuration

- Use the default setting



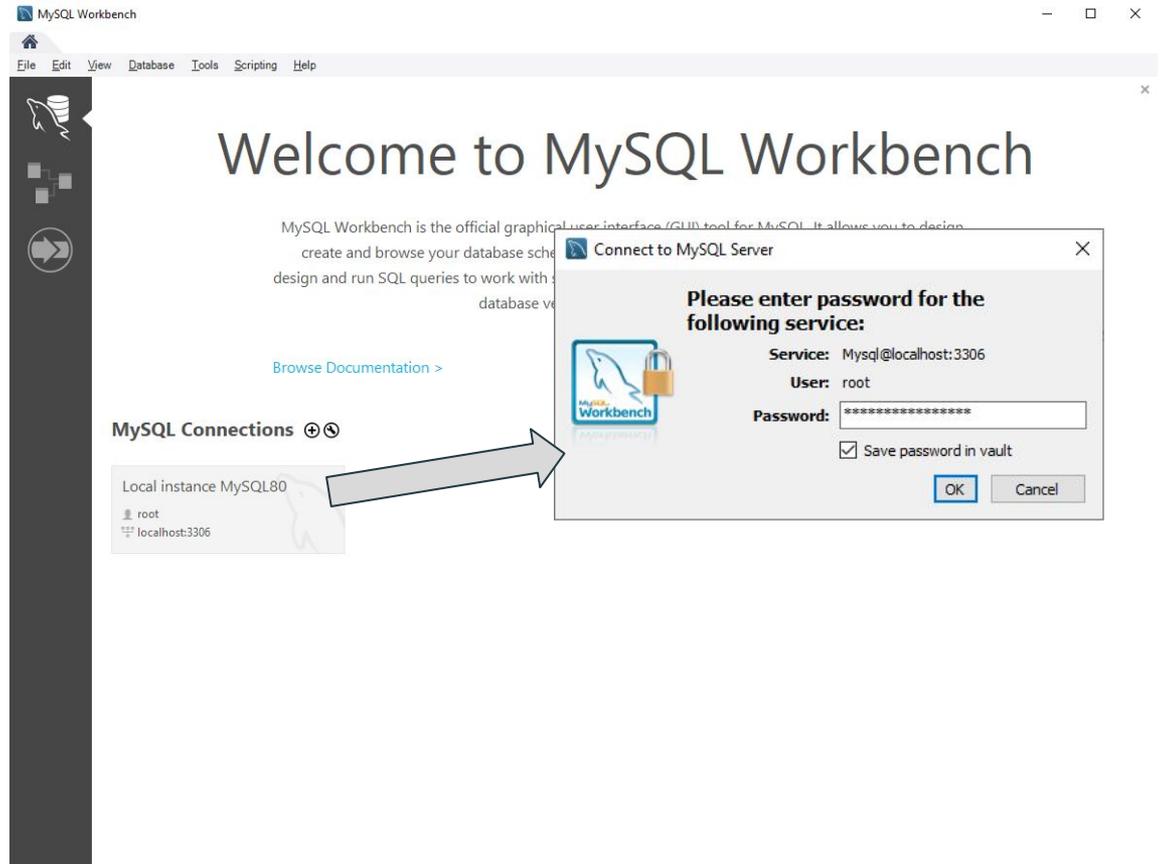
MySQL Server configuration

- Workbench will be started when MySQL installation completed



MySQL Workbench configuration

- Use the “root” password



MySQL Workbench configuration

- Type the following SQL statement to test the query:

```
use sys;
```

```
Select * from  
sys_config;
```

MySQL Workbench

Local instance MySQL80 x

File Edit View Query Database Server Tools Scripting Help

Navigator: Query 1 x

SCHEMAS 2

Filter objects

sys

- Tables
 - sys_config
- Views
- Stored Procedures
- Functions

1 • use sys;
2 • select * from sys_config; 3

Result Grid

variable	value	set_time	set_by
diagnostics.allow_j_s_tables	OFF	2023-11-09 09:44:31	NULL
diagnostics.include_raw	OFF	2023-11-09 09:44:31	NULL
ps_thread_trx_info.max_length	65535	2023-11-09 09:44:31	NULL
statement_performance_analyzer.limit	100	2023-11-09 09:44:31	NULL
statement_performance_analyzer.view	NULL	2023-11-09 09:44:31	NULL
statement_truncate_len	64	2023-11-09 09:44:31	NULL
*	NULL	NULL	NULL

Administration Schemas

MySQL Workbench configuration

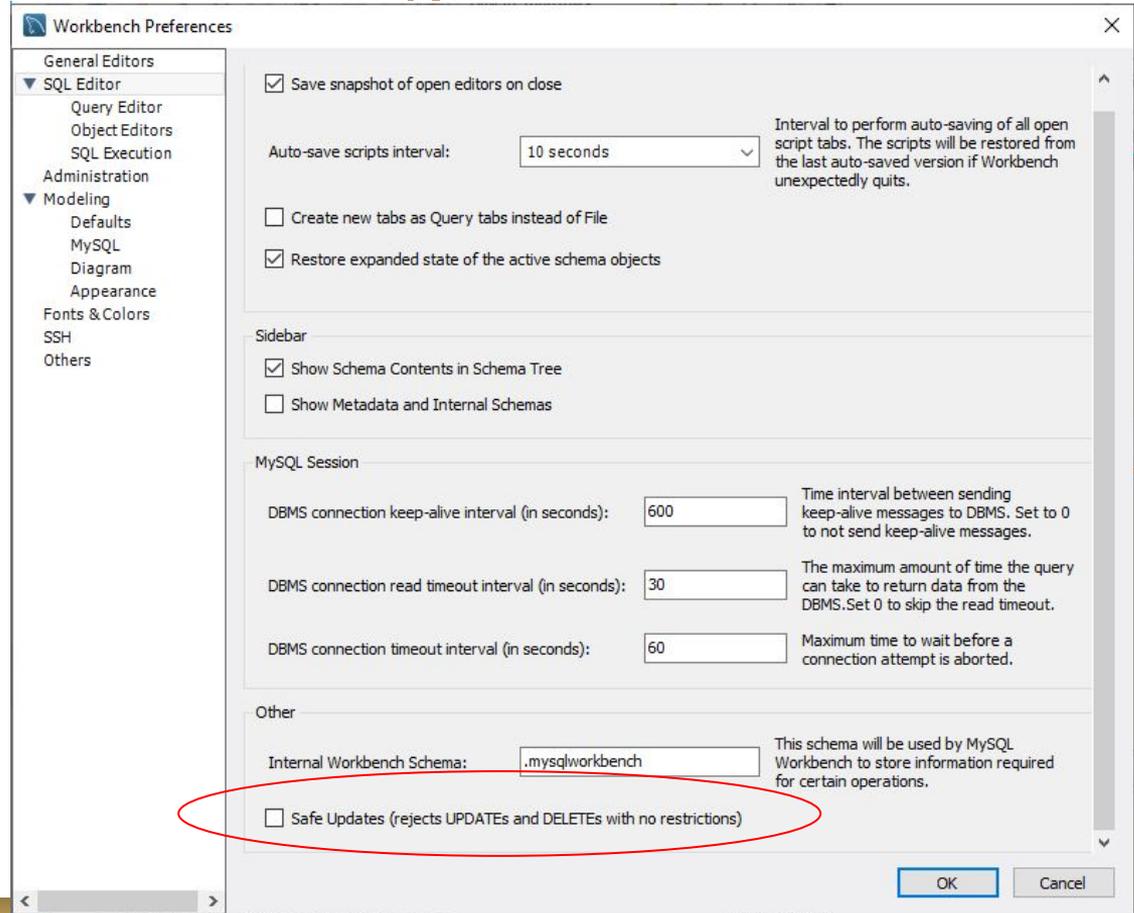
- Select “Edit > References”

The screenshot shows the MySQL Workbench interface. The 'Edit' menu is open, and the 'References...' option is highlighted. The 'Edit' menu is circled in red with a '1', and the 'References...' option is circled in red with a '2'. The background shows a table named 'sys_config' with columns 'variable', 'value', 'set_time', and 'set_by'. The table data is as follows:

variable	value	set_time	set_by
diagnostics.allow_j_s_tables	OFF	2023-11-09 09:44:31	NULL
diagnostics.include_raw	OFF	2023-11-09 09:44:31	NULL
ps_thread_trx_info.max_length	65535	2023-11-09 09:44:31	NULL
statement_performance_analyzer.limit	100	2023-11-09 09:44:31	NULL
statement_performance_analyzer.view	NULL	2023-11-09 09:44:31	NULL
statement_truncate_len	64	2023-11-09 09:44:31	NULL
*	NULL	NULL	NULL

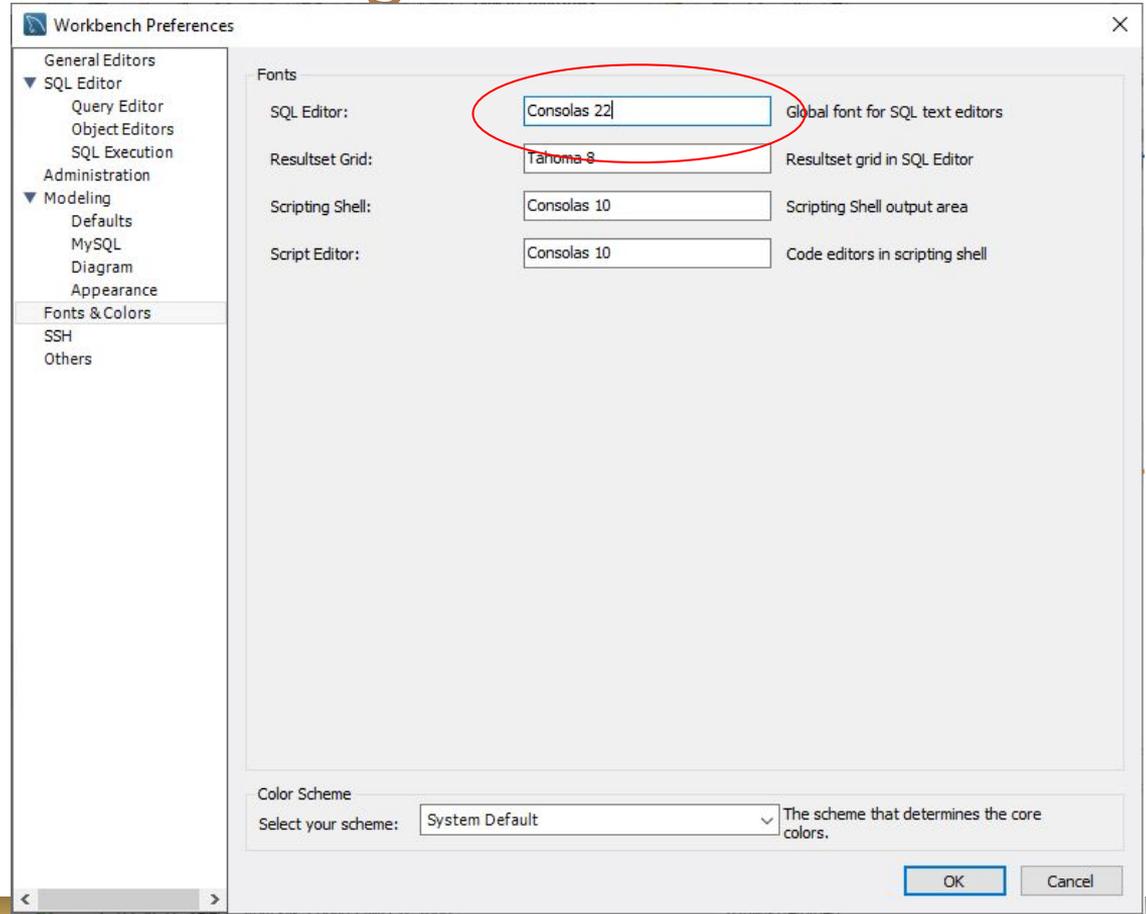
MySQL Workbench configuration

- Untick “Safe Updates” option on SQL Editor
- To enable queries such as update or delete

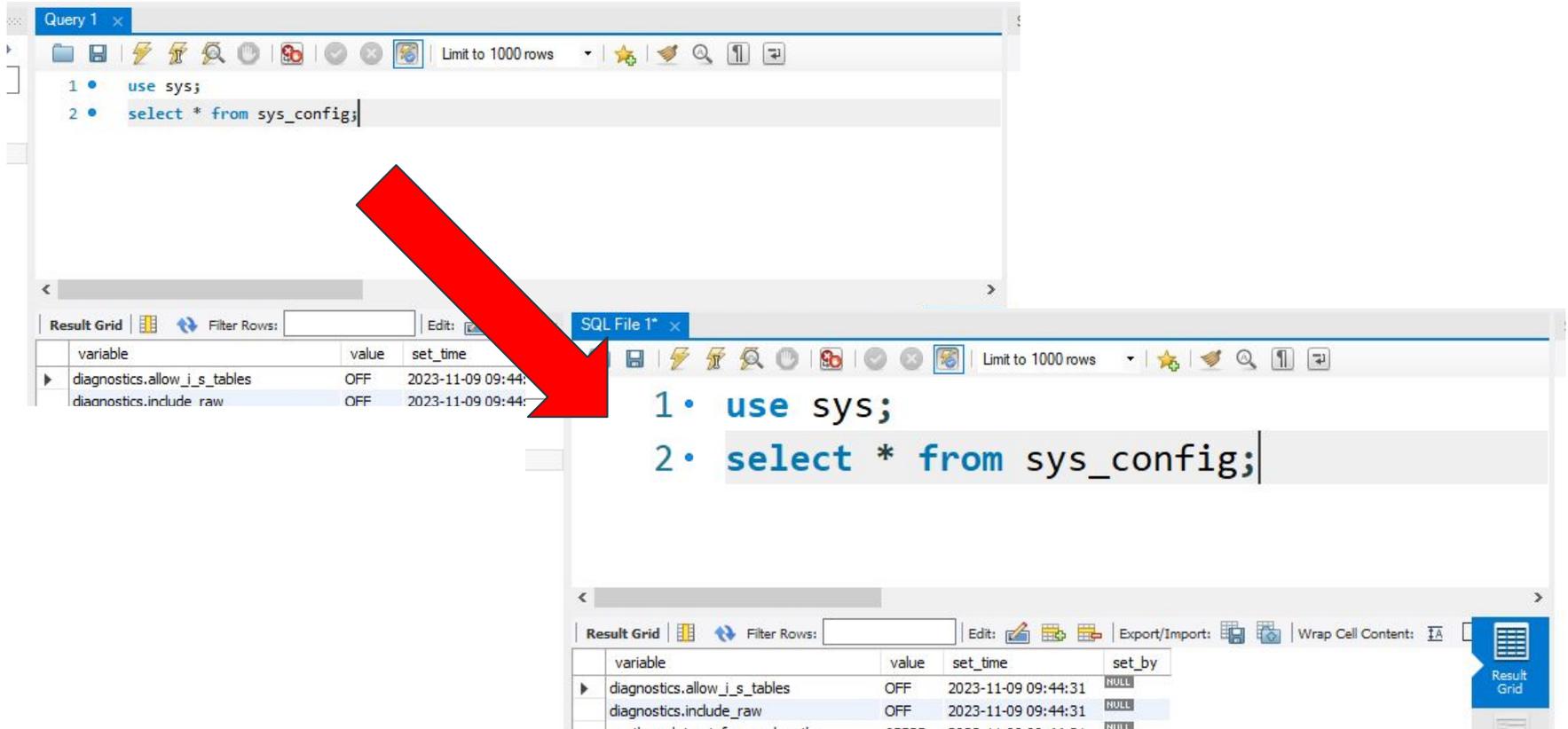


MySQL Workbench configuration

- Change the font size from 10 to 22 on “Fonts & Colors” setting
- For better demonstration to students



MySQL Workbench configuration



The image shows two overlapping windows in MySQL Workbench. The top window, titled "Query 1", contains the following SQL code:

```
1 • use sys;  
2 • select * from sys_config;
```

The bottom window, titled "SQL File 1*", contains the same SQL code. A large red arrow points from the "Query 1" window to the "SQL File 1*" window.

Below the "SQL File 1*" window, a "Result Grid" window is visible, displaying the following data:

variable	value	set_time	set_by
diagnostics.allow_i_s_tables	OFF	2023-11-09 09:44:31	NULL
diagnostics.include_raw	OFF	2023-11-09 09:44:31	NULL

MySQL Workbench - Create a admin A/C

- Don't use the "root" account for daily operation

The screenshot shows the MySQL Workbench interface for managing users and privileges. The 'Users and Privileges' tab is active, displaying a table of existing user accounts and a form to create a new one. Red circles and numbers highlight key elements:

- 1**: The 'Administration' tab in the left-hand 'MANAGEMENT' sidebar.
- 2**: The 'Users and Privileges' option in the 'MANAGEMENT' sidebar.
- 3**: The 'Add Account' button at the bottom of the 'User Accounts' table.

User	From Host
mysql.infoschema	localhost
mysql.session	localhost
mysql.sys	localhost
root	localhost

The 'Add Account' form includes the following fields:

- Login Name:
- Authentication Type: **SHA256 Password** (dropdown)
- Limit to Hosts Matching: % and _ wildcards may be use
- Password: Type a password to reset it.
- Confirm Password: Enter password again to confir
- Authentication String: Authentication plugin specific p

Buttons at the bottom: Add Account, Delete, Refresh, Revert, Apply.

Automatic disabled. Use manually current toggle au

MySQL Workbench - Create a admin A/C

- Select “Administrative roles”

MySQL Workbench

Local instance MySQL80

File Edit View Query Database Server Tools Scripting Help

Navigator: SQL File 1* Administration - Users and Privileges

MANAGEMENT

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

INSTANCE

- Startup / Shutdown
- Server Logs
- Options File

PERFORMANCE

- Dashboard
- Performance Reports
- Performance Schema Setup

Administration Schemas

Information

Local instance MySQL80
Users and Privileges

User Accounts

User	From Host
mysql.infoschema	localhost
mysql.session	localhost
mysql.sys	localhost
newuser	%
root	localhost

Details for account newuser@%

Login Account Limits Administrative Roles Schema Privileges

Login Name: You may create multiple accounts with 1 to connect from different hosts.

Authentication Type: For the standard password and/or host select 'Standard'.

Limit to Hosts Matching: % and _ wildcards may be used

Password: Type a password to reset it.
Medium strength password.

Confirm Password: Enter password again to confirm.

Table: sys_config

Columns:

variable	value
PK	varchar(128)
set_time	varchar(128)
set_by	timestamp

Action Output

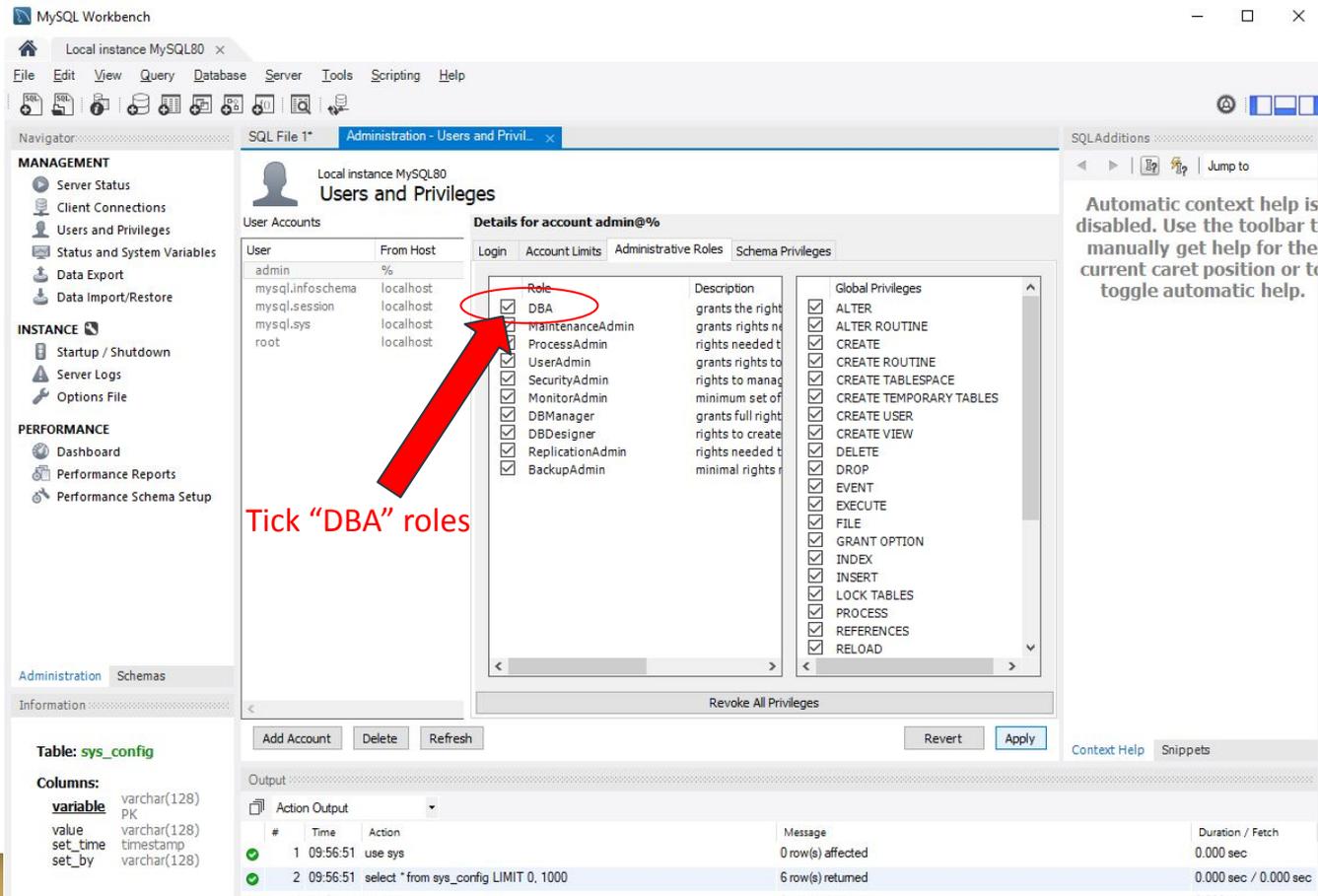
#	Time	Action	Message	Duration / Fetch
1	09:56:51	use sys	0 row(s) affected	0.000 sec
2	09:56:51	select * from sys_config LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec
3	12:09:55	use sys	0 row(s) affected	0.000 sec
4	12:09:55	select * from sys_config LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec

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

Context Help Snippets

MySQL Workbench - Create a admin A/C

- Tick “DBA” as Database administrator to grant the full right on this account



The screenshot shows the MySQL Workbench interface for managing users and privileges. The 'Users and Privileges' window is open, displaying the 'Details for account admin@%' tab. A red arrow points to the 'DBA' role checkbox in the 'Administrative Roles' section. The 'Global Privileges' section is also visible, showing various privileges that are checked.

Administrative Roles:

Role	Description
<input checked="" type="checkbox"/> DBA	grants the right
<input checked="" type="checkbox"/> MaintenanceAdmin	grants rights ne
<input checked="" type="checkbox"/> ProcessAdmin	rights needed t
<input checked="" type="checkbox"/> UserAdmin	grants rights to
<input checked="" type="checkbox"/> SecurityAdmin	rights to manag
<input checked="" type="checkbox"/> MonitorAdmin	minimum set of
<input checked="" type="checkbox"/> DBManager	grants full right
<input checked="" type="checkbox"/> DBDesigner	rights to create
<input checked="" type="checkbox"/> ReplicationAdmin	rights needed t
<input checked="" type="checkbox"/> BackupAdmin	minimal rights r

Global Privileges:

Privilege	Status
ALTER	<input checked="" type="checkbox"/>
ALTER ROUTINE	<input checked="" type="checkbox"/>
CREATE	<input checked="" type="checkbox"/>
CREATE ROUTINE	<input checked="" type="checkbox"/>
CREATE TABLESPACE	<input checked="" type="checkbox"/>
CREATE TEMPORARY TABLES	<input checked="" type="checkbox"/>
CREATE USER	<input checked="" type="checkbox"/>
CREATE VIEW	<input checked="" type="checkbox"/>
DELETE	<input checked="" type="checkbox"/>
DROP	<input checked="" type="checkbox"/>
EVENT	<input checked="" type="checkbox"/>
EXECUTE	<input checked="" type="checkbox"/>
FILE	<input checked="" type="checkbox"/>
GRANT OPTION	<input checked="" type="checkbox"/>
INDEX	<input checked="" type="checkbox"/>
INSERT	<input checked="" type="checkbox"/>
LOCK TABLES	<input checked="" type="checkbox"/>
PROCESS	<input checked="" type="checkbox"/>
REFERENCES	<input checked="" type="checkbox"/>
RELOAD	<input checked="" type="checkbox"/>

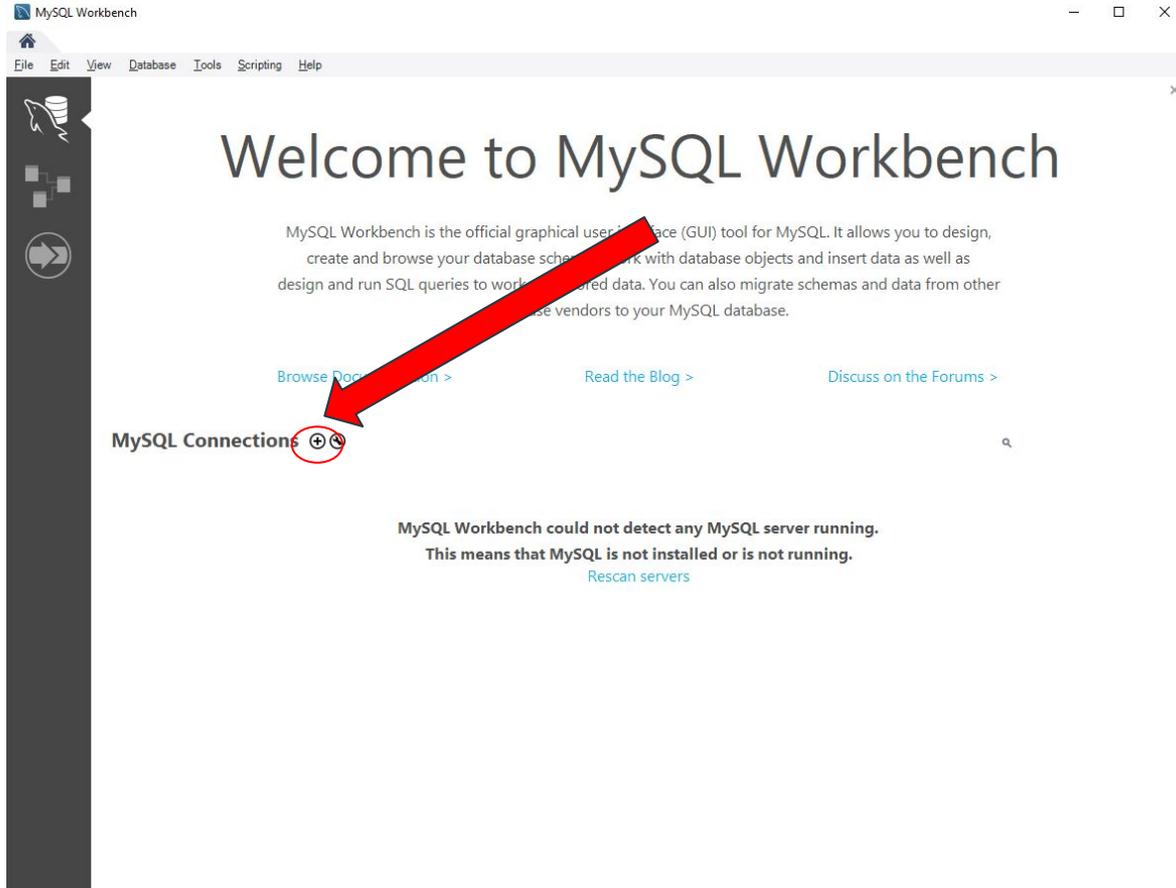
Output:

#	Time	Action	Message	Duration / Fetch
1	09:56:51	use sys	0 row(s) affected	0.000 sec
2	09:56:51	select * from sys_config LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec

Tick “DBA” roles

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

MySQL Workbench - Create a new connection



MySQL Workbench - Create a new connection

The screenshot shows the 'Setup New Connection' dialog box in MySQL Workbench. The 'Parameters' tab is selected, showing fields for Connection Name, Connection Method (Standard (TCP/IP)), Hostname (127.0.0.1), Port (3306), Username (root), Password (with 'Store in Vault ...' button circled), and Default Schema. A secondary dialog box 'Store Password For Connection' is open, prompting for the password for the 'Mysql@10' service with the user 'admin'. Red arrows point from text labels to the corresponding fields in both dialog boxes.

Connection Name

Server IP or 127.0.0.1

Account name: admin

Password

Connection Name: Type a name for the connection

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

Parameters SSL Advanced

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

Username: root Name of the user to connect with.

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

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

Store Password For Connection

Please enter password for the following service:

Service: Mysql@10

User: admin

Password:

OK Cancel

Configure Server Management... Test Connection Cancel OK

MySQL Workbench - New connection example

The screenshot shows the 'Setup New Connection' dialog box in MySQL Workbench. The window title is 'Setup New Connection'. It contains the following fields and options:

- Connection Name:** Text box containing 'Test Server'. To the right, the text reads 'Type a name for the connection'.
- Connection Method:** Dropdown menu showing 'Standard (TCP/IP)'. To the right, the text reads 'Method to use to connect to the RDBMS'.
- Parameters:** A tabbed interface with three tabs: 'Parameters' (selected), 'SSL', and 'Advanced'.
- Hostname:** Text box containing '192.168.0.100'. To its right is a **Port:** text box containing '3306'. To the right of the port box, the text reads 'Name or IP address of the server host - and TCP/IP port.'
- Username:** Text box containing 'admin'. To the right, the text reads 'Name of the user to connect with.'
- Password:** A text box with two buttons: 'Store in Vault ...' and 'Clear'. To the right, the text reads 'The user's password. Will be requested later if it's not set.'
- Default Schema:** Text box, currently empty. To the right, the text reads 'The schema to use as default schema. Leave blank to select it later.'

At the bottom of the dialog, there are four buttons: 'Configure Server Management...', 'Test Connection', 'Cancel', and 'OK'.

Create MySQL user/student account and database

- Create user

- CREATE USER 'user_id'@'%' IDENTIFIED BY 'user_password';

- Create database

- CREATE DATABASE 'user_db';

- Grant/remove rights on specific database

- GRANT ALL PRIVILEGES ON user_db.* TO 'user_id'@'%';

- REVOKE DROP, ALTER ON user_db.* FROM 'user_id'@'%';

Sample SQL script

- Student username: s202300001, password: s202300001Stu
- Create user and database
 - ```
CREATE USER 's202300001'@'%' IDENTIFIED BY 's202300001Stu';CREATE DATABASE `s202300001`;GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@'%;REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@'%';
```
- Create second database
  - ```
CREATE DATABASE `s202300001 classwork`;GRANT ALL PRIVILEGES ON s202300001 classwork.* TO 's202300001'@'%;REVOKE DROP, ALTER ON s202300001 classwork.* FROM 's202300001'@'%';
```

Create bulk users accounts and databases with spreadsheet

mysql account demo .XLSX ☆ 📁 ☁

File Edit View Insert Format Data Tools Help

100% 123 Default... 10 B I A

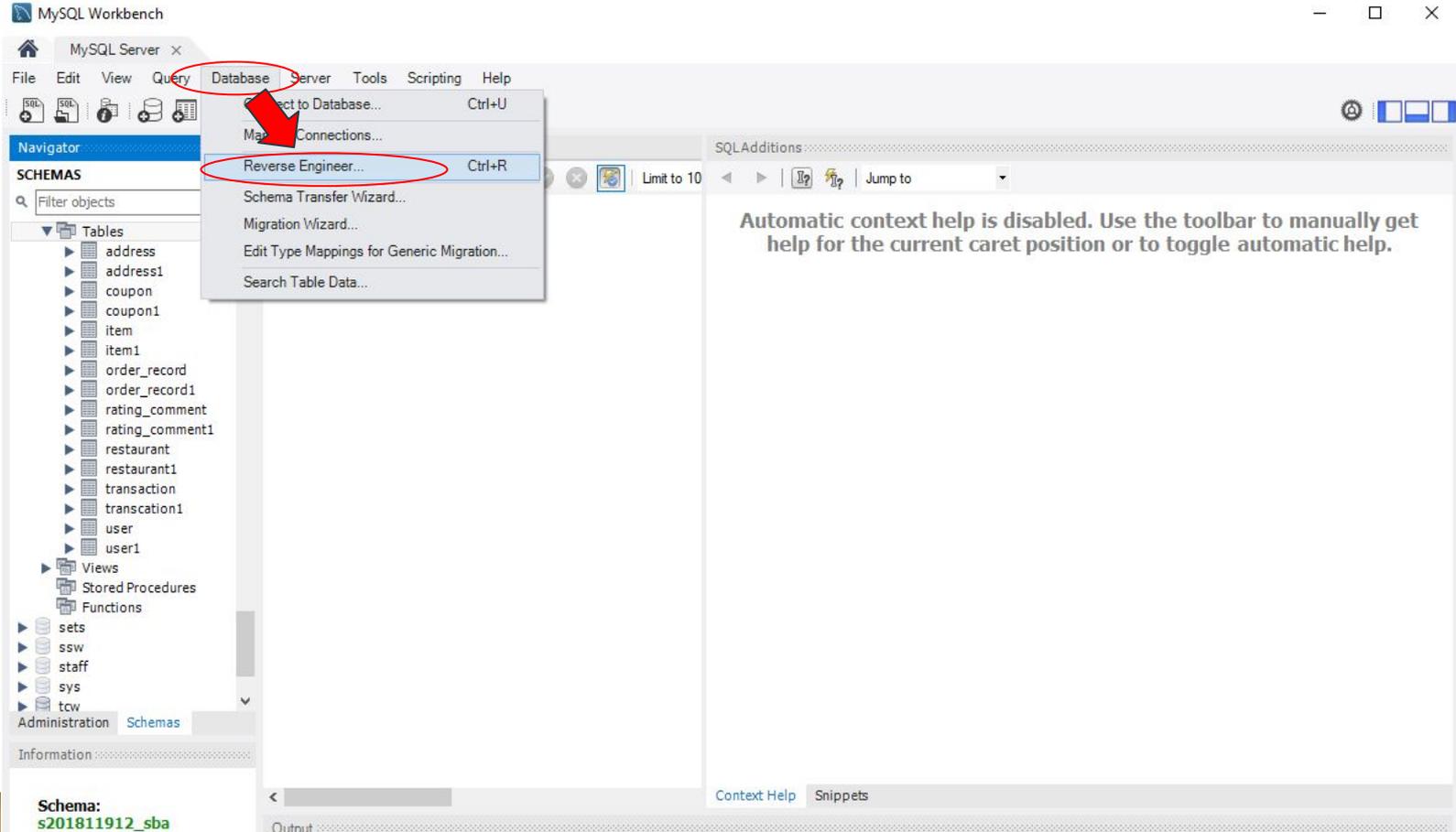
A1 reg

	A	B	C	D	E	F	G
1	reg	class	name_e	name_c	MYSQL Login	Password	script_createdb_stdid
2	202300001	6X01	Chan Tai Man	陳大文	s202300001	s202300001S	CREATE USER 's202300001'@%' IDENTIFIED BY 's202300001S'; CREATE DATABASE 's202300001_classwork'; GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@%; REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@%;
3	202300001	6X02	Chan Siu Ming	陳小明	s202300001	s202300001S	CREATE USER 's202300001'@%' IDENTIFIED BY 's202300001S'; CREATE DATABASE 's202300001_classwork'; GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@%; REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@%;
4	202300001	6X03	Chan Siu Mei	陳小美	s202300001	s202300001S	CREATE USER 's202300001'@%' IDENTIFIED BY 's202300001S'; CREATE DATABASE 's202300001_classwork'; GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@%; REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@%;
5	202300001	6X04	Li Ka Sing	李嘉誠	s202300001	s202300001S	CREATE USER 's202300001'@%' IDENTIFIED BY 's202300001S'; CREATE DATABASE 's202300001_classwork'; GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@%; REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@%;
6	202300001	6X05	Li Chak Kai	李澤楷	s202300001	s202300001S	CREATE USER 's202300001'@%' IDENTIFIED BY 's202300001S'; CREATE DATABASE 's202300001_classwork'; GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@%; REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@%;
7	202300001	6X06	Lau Mei Mei	劉美美	s202300001	s202300001S	CREATE USER 's202300001'@%' IDENTIFIED BY 's202300001S'; CREATE DATABASE 's202300001_classwork'; GRANT ALL PRIVILEGES ON s202300001.* TO 's202300001'@%; REVOKE DROP, ALTER ON s202300001.* FROM 's202300001'@%;
8							
9							

name list admin account script sql statement



MySQL Workbench - Create a ER-diagram



The screenshot shows the MySQL Workbench interface. The 'Database' menu is open, and the 'Reverse Engineer...' option is highlighted with a red circle. A red arrow points to the 'Reverse Engineer...' option. The 'Navigator' pane on the left shows a tree view of the database schema, including tables, views, stored procedures, and functions. The 'SQLAdditions' pane on the right displays a message: 'Automatic context help is disabled. Use the toolbar to manually get help for the current caret position or to toggle automatic help.'

MySQL Workbench

MySQL Server x

File Edit View Query Database Server Tools Scripting Help

Connect to Database... Ctrl+U

Map Connections...

Reverse Engineer... Ctrl+R

Schema Transfer Wizard...

Migration Wizard...

Edit Type Mappings for Generic Migration...

Search Table Data...

Navigator

SCHEMAS

Filter objects

Tables

- address
- address1
- coupon
- coupon1
- item
- item1
- order_record
- order_record1
- rating_comment
- rating_comment1
- restaurant
- restaurant1
- transaction
- transaction1
- user
- user1

Views

Stored Procedures

Functions

sets

ssw

staff

sys

tcw

Administration Schemas

Information

Schema: s201811912_sba

SQLAdditions

Limit to 10

Jump to

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

Context Help Snippets

Output

MySQL Workbench - Create a ER-diagram

- Select stored connection or type admin account information

Reverse Engineer Database ✕

Connection Options

- Connect to DBMS
- Select Schemas
- Retrieve Objects
- Select Objects
- Reverse Engineer
- Results

Set Parameters for Connecting to a DBMS

Stored Connection: Select from saved connection settings

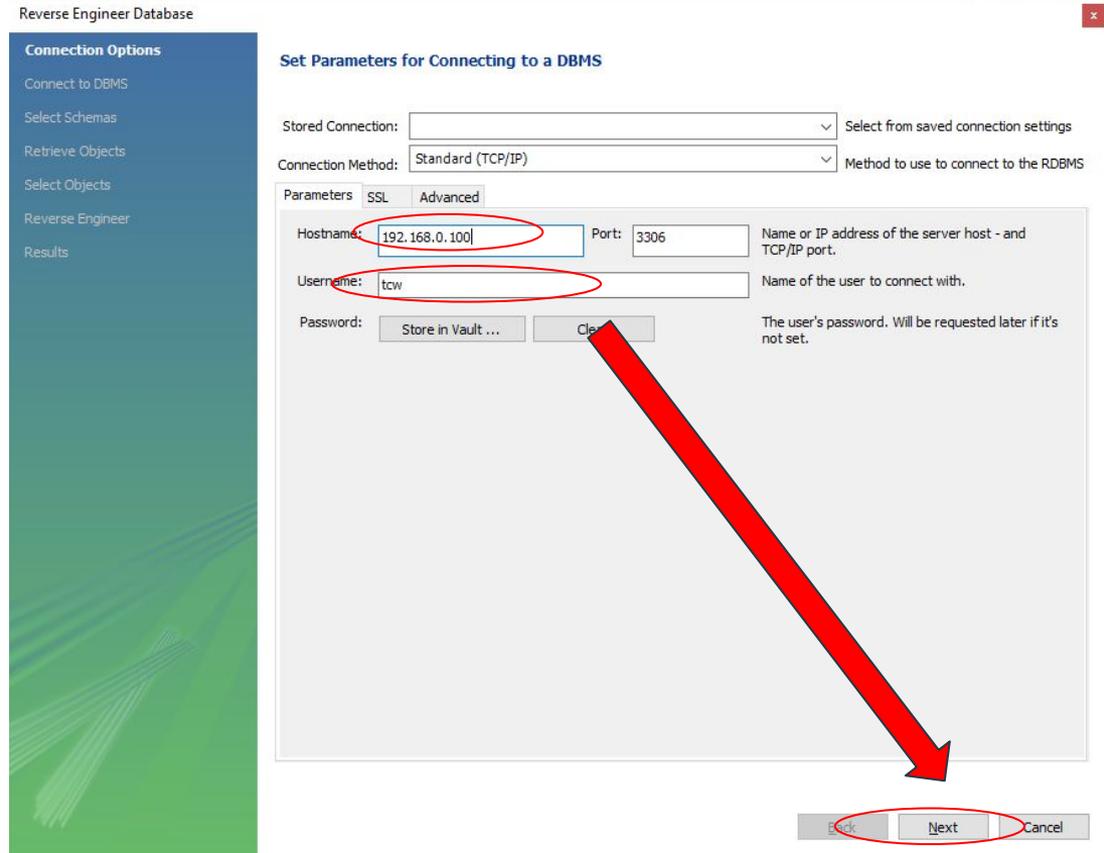
Connection Method: Standard (TCP/IP) Method to use to connect to the RDBMS

Parameters SSL Advanced

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

Username: Name of the user to connect with.

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

The screenshot shows the MySQL Workbench interface for setting connection parameters. A red arrow points from the 'Clear' button in the password field to the 'Next' button at the bottom of the dialog. Red circles highlight the 'Hostnames' field containing '192.168.0.100', the 'Username' field containing 'tcw', and the 'Next' button.

MySQL Workbench - Create a ER-diagram

Reverse Engineer Database ✕

Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results

Connect to DBMS and Fetch Information

The following tasks will now be executed. Please monitor the execution.
Press Show Logs to see the execution logs.

- Connect to DBMS
- Retrieve Schema List from Database
- Check Common Server Configuration Issues

Execution Completed Successfully
Fetch finished.

Show Logs

Back Next Cancel



MySQL Workbench - Create a ER-diagram

- Select the database

The screenshot shows the 'Reverse Engineer Database' dialog box in MySQL Workbench. The left sidebar contains a menu with options: 'Connection Options', 'Connect to DBMS', 'Select Schemas', 'Retrieve Objects', 'Select Objects', 'Reverse Engineer', and 'Results'. The 'Select Schemas' option is currently selected. The main area is titled 'Select Schemas to Reverse Engineer' and contains a list of schemas with checkboxes. The 'tcw' schema is selected and circled in red. At the bottom right, the 'Next' button is circled in red and has a red arrow pointing to it.

Reverse Engineer Database

Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results

Select Schemas to Reverse Engineer

Select the schemas you want to include:

- award
- bus
- customer
- invoice
- music
- mydb1
- post
- s2022001
- sets
- staff
- tcw
- vehicle

Back Next Cancel

MySQL Workbench - Create a ER-diagram

Reverse Engineer Database x

Connection Options

Connect to DBMS

Select Schemas

Retrieve Objects

Select Objects

Reverse Engineer

Results

Retrieve and Reverse Engineer Schema Objects

The following tasks will now be executed. Please monitor the execution. Press Show Logs to see the execution logs.

- Retrieve Objects from Selected Schemas
- Check Results

Retrieval Completed Successfully
Finished.

Show Logs

Back Next Cancel



MySQL Workbench - Create a ER-diagram

- Select the table(s)

Reverse Engineer Database

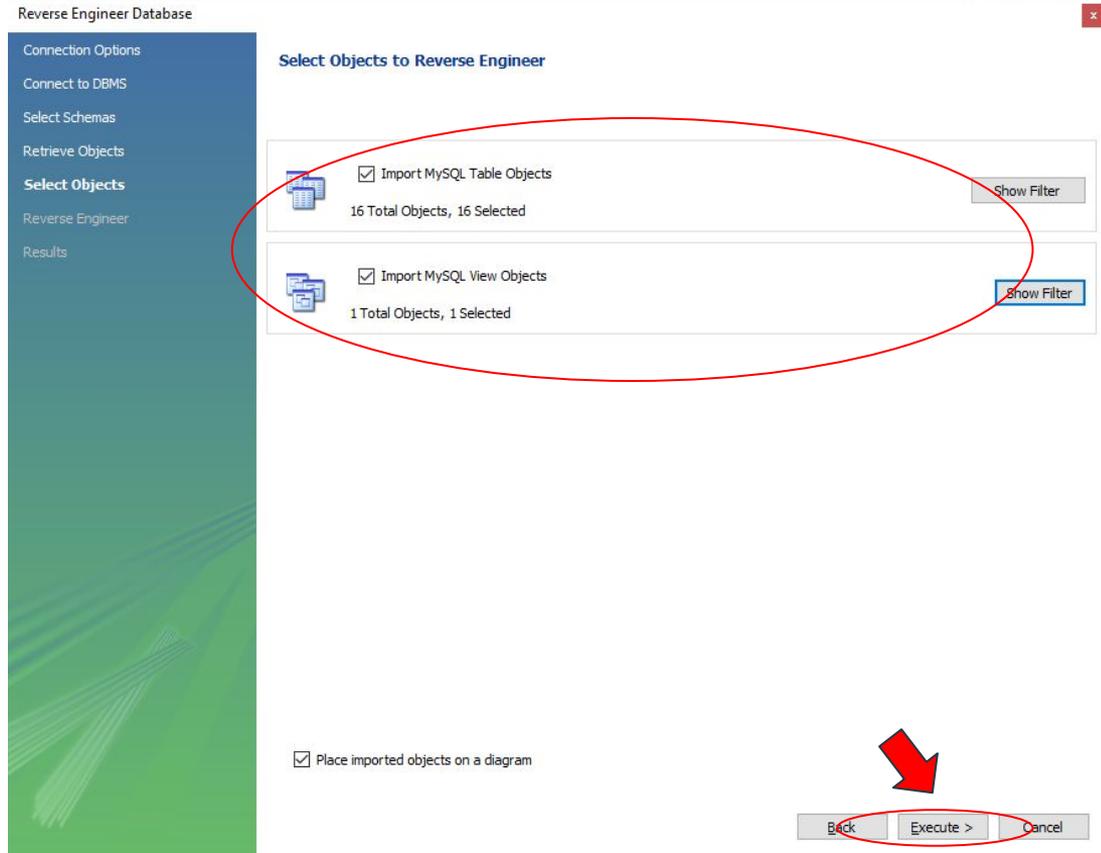
Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results

Select Objects to Reverse Engineer

<input checked="" type="checkbox"/> Import MySQL Table Objects	Show Filter
16 Total Objects, 16 Selected	
<input checked="" type="checkbox"/> Import MySQL View Objects	Show Filter
1 Total Objects, 1 Selected	

Place imported objects on a diagram

Back Execute > Cancel



MySQL Workbench - Create a ER-diagram

- (Option) Show or hide some tables

Reverse Engineer Database

Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results

Select Objects to Reverse Engineer

Import MySQL Table Objects

26 Total Objects, 3 Selected

Show tables

tcw.book
tcw.loanrecord
tcw.student

>
<
>>
<<
+

Hide tables

tcw.librarian
tcw.membership
tcw.post
tcw.product
tcw.project
tcw.rental
tcw.salorder
tcw.salstaff
tcw.seta
tcw.setb
tcw.song
tcw.staffrec

Hide Filter

Use the + button to exclude objects matching wildcards such as * and ?

Import MySQL View Objects

6 Total Objects, 6 Selected

Show Filter

Place imported objects on a diagram

Back Execute > Cancel

MySQL Workbench - Create a ER-diagram

Reverse Engineer Database ✕

Connection Options
Connect to DBMS
Select Schemas
Retrieve Objects
Select Objects
Reverse Engineer
Results

Reverse Engineering Progress

The following tasks will now be executed. Please monitor the execution.
Press Show Logs to see the execution logs.

- Reverse Engineer Selected Objects
- Place Objects on Diagram

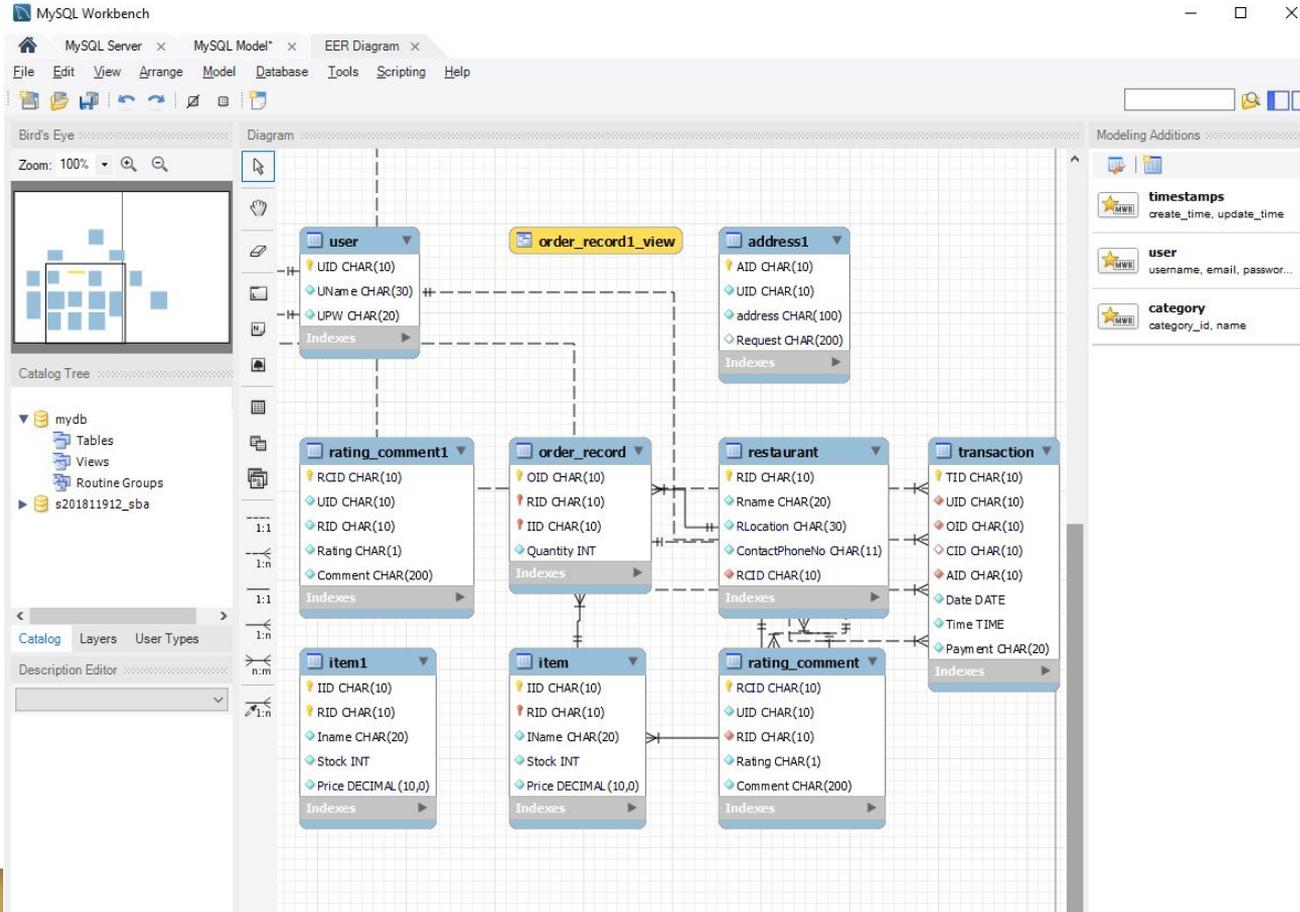
Operation Completed Successfully

Show Logs

Back Next Cancel

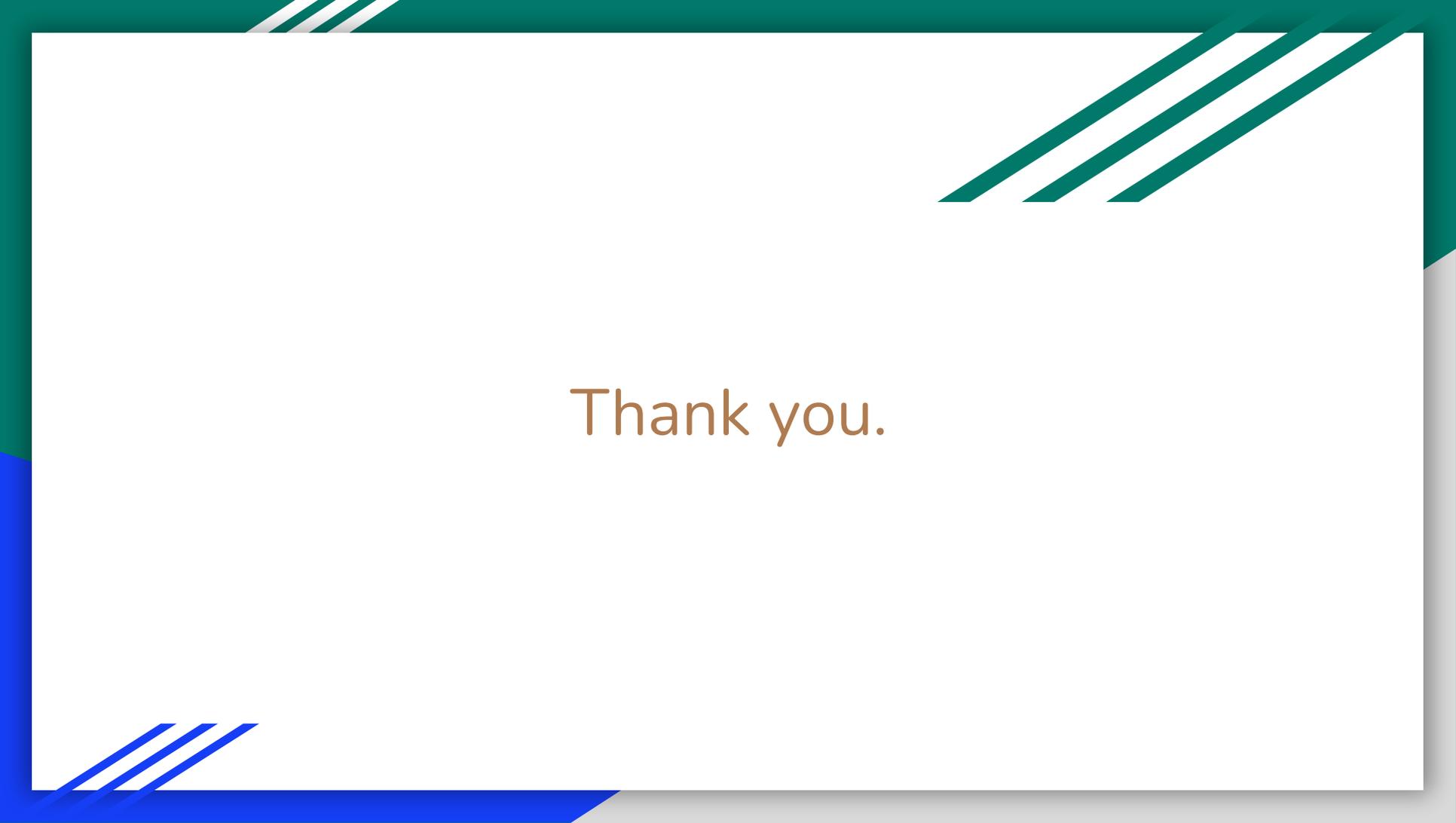


MySQL Workbench - Create a ER-diagram



MySQL server remote connections

- Server/Firewall/Router Setting
 - NAT setting and Port forwarding (Don't use default TCP 3306)
 - Access control list(ACL) on firewall to prevent unauthorized access
 - Restrict only localhost access of root account
 - Change “%” to “localhost” or IP Address(es) on “Limit to Hosts Matching”
 - Use complex password
- MySQL Workbench
 - Change the connection IP address from 127.0.0.1/localhost to server IP or public IP
 - Change the default TCP port



Thank you.