Laboratory 1

Database configuration and management software
Creation of NW *personnel*

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Target

Installation, initialization and familiarization with database configuration and management software. Here are instructions for a PC with WinOS operating system.

xampp network services installation and management platform

xampp is an open source package available for free. It integrates into the installed system (a) the **Apache web server software,** (b) the MySQL, MariaDB relational database management system environment , (c) support for the **PHP** web programming language , and (d) support for the Perl programming language .

A. Installation

NOTE: The following steps do not need to be implemented for the lab PCs.

1. Visit the link https://www.apachefriends.org/ and proceed to **save (download)** the newest version of the xampp software, depending on the operating system of your PC. For more details you can consult the guide: 01_xampp_download.mov

2. Locate the file on your computer, confirm that it has been saved correctly, and **run** it to start the installation process. For more details you can consult the guide: 02_xampp_installation.mov

3. When starting the installation you may get the **message** in Figure 1. Select **OK** to proceed with the installation process.

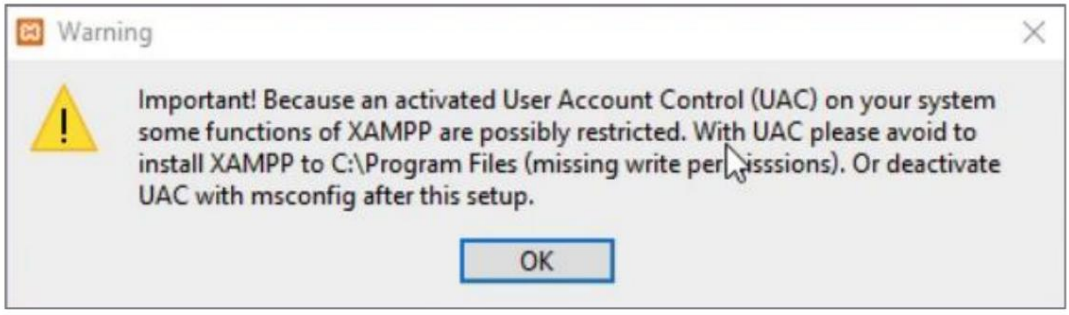


Figure 1. System message about access rights to the “Program Files” folder

4. In selecting the **individual components** to be installed, proceed by accepting the default selection of all components, as shown in Figure 2.

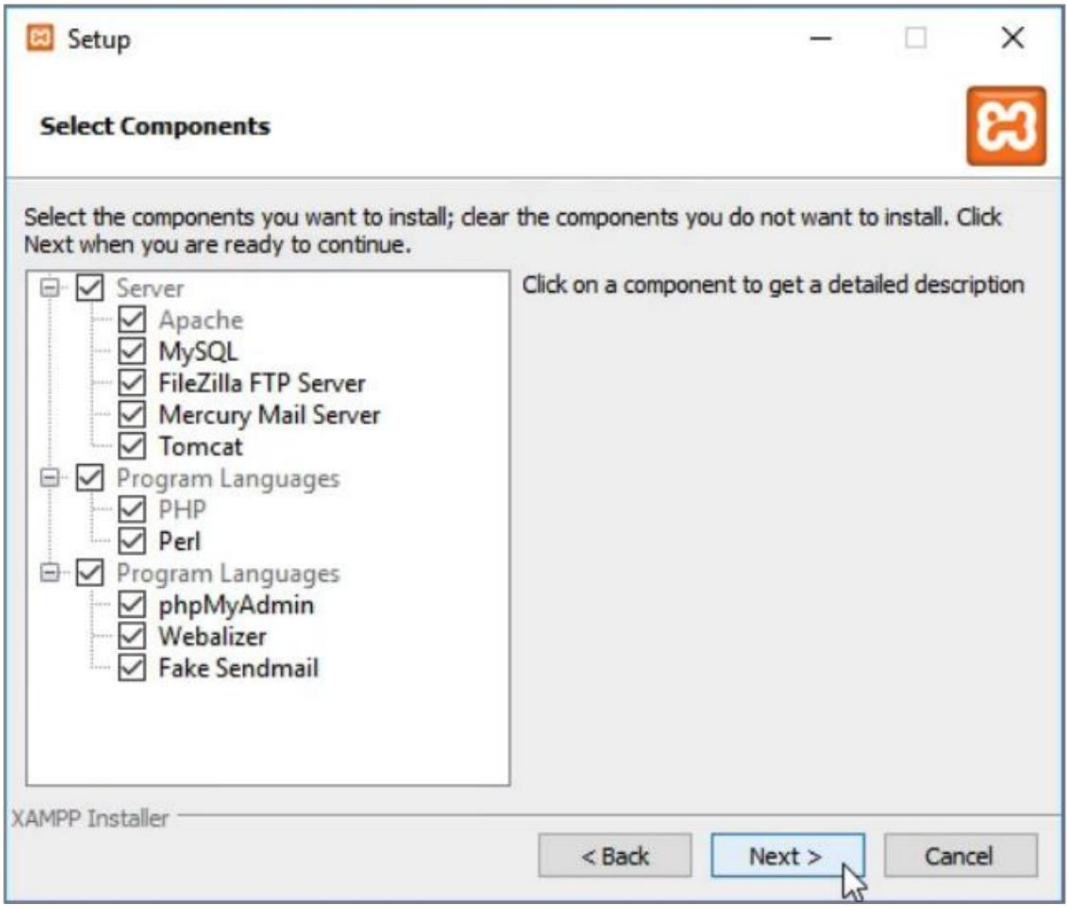


Figure 2. Components to install

5. When selecting the **folder** on the system storage disk where xampp will be installed, proceed by accepting the default folder (name and location), as shown in Figure 3.

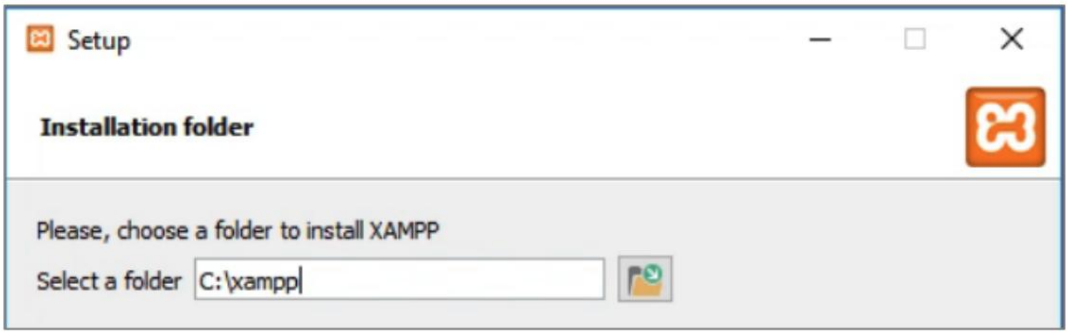


Figure 3. Folder and path for xampp

6. When asked if you want to update xampp's **Bitnami** plugin for Content Management System (CMS) support, proceed by removing the default checkbox, as shown in Figure 4.

Figure 4. Option about plugin for xampp Bitnami CMS support

7. When asked if you want **network access** to the xampp web server, proceed by allowing it access to the local network, as shown in Figure 5.

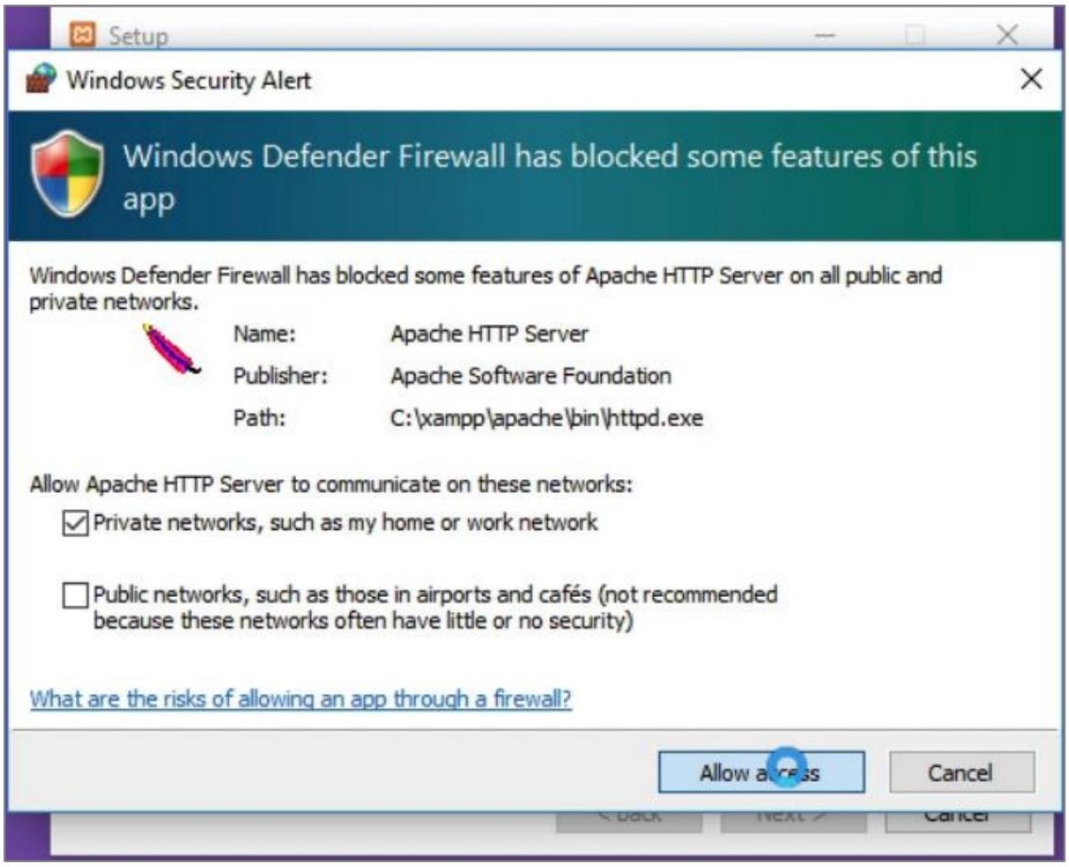


Figure 5. Web server access option

B. xampp control panel

1. With the installation of the xampp software, the control panel (xampp control panel) has been installed to manage the individual services. For more details you can consult the guide: 03_xampp_control.mov

2. Locate the **control panel executable** in the xampp installation folder (as you defined it in step A.5 of the installation process). Run the file to activate the control panel. In the case of installing xampp on a WinOS operating system according to the instructions above, the file will be named **xampp-control.exe,** as shown in Figure 6.

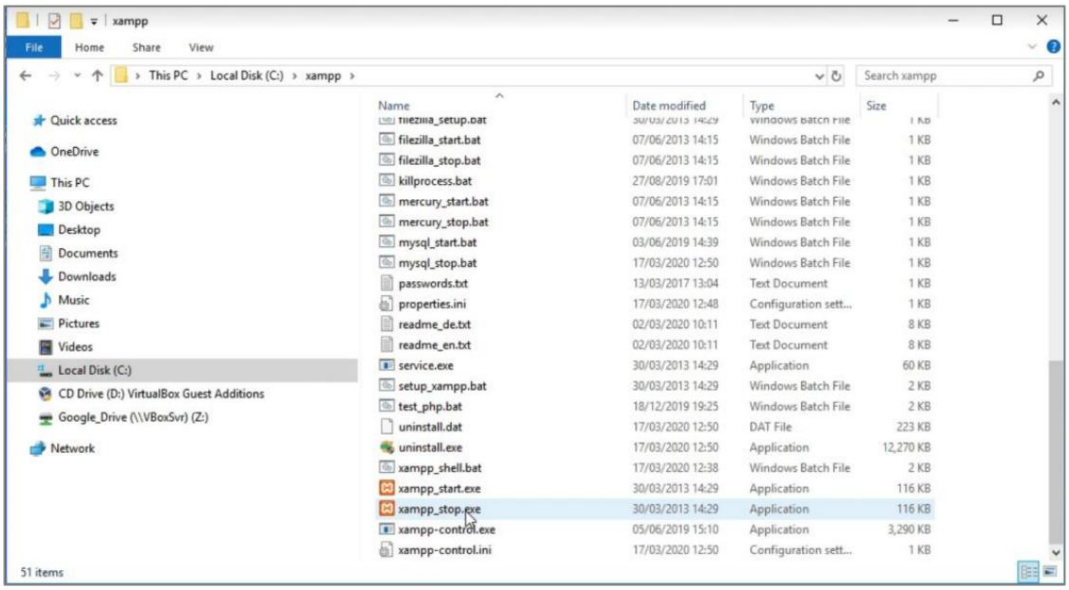


Figure 6. xampp control panel activation file

3. The first run of xampp-control will be given the **choice of** display language. You choose the english.

4. From run time onwards (step B.2), the control panel runs in the **background** of system processes. In the case of installing xampp on WinOS according to the instructions above, the control panel appears with the icon and can be pulled out for use as shown in Figure 7.

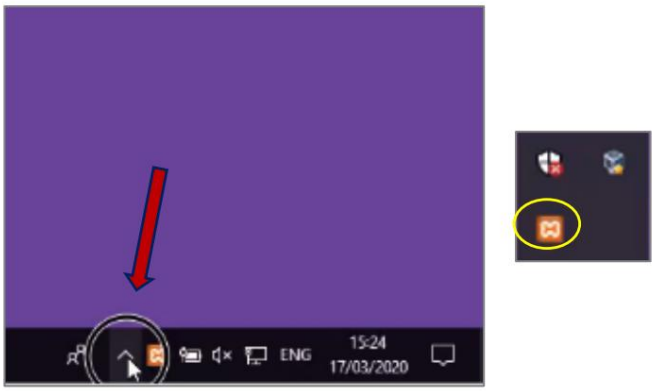
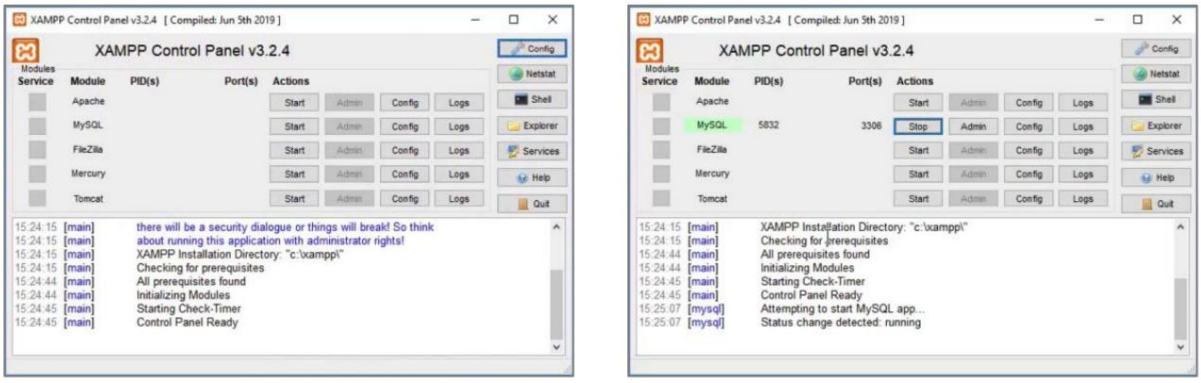


Figure 7. Pulling up the xampp control panel from the background

5. The **Module** column in the xampp control panel environment lists the individual services available for management. In the **Actions** column, it is possible to start the services that are inactive and to stop the services that are active. To access the database management environment, **the MySQL service must be running.** For more details you can consult the guide: mysql_startup_service.mov. Next appears the

xampp dashboard when all services are disabled (Figure 8a) and after MySQL service is enabled (Figure 8b).



(a) (b)

Figure 8. xampp dashboard environment where **(a)** all services are down and **(b)** MySQL service is enabled

NOTE: For security reasons it is recommended to **disable the MySQL service** when its operation is not required.

6. When asked if you want **network access** to the xampp database management environment, proceed by allowing access to the local network, as shown in Figure 9.

Figure 9. Database management environment access option

C. Connecting to the MySQL environment using a shell

1. Follow steps B.1-B.4 to enable xampp control panel and make sure the MySQL service is active.
2. Select **Shell,** as shown in Figure 10.

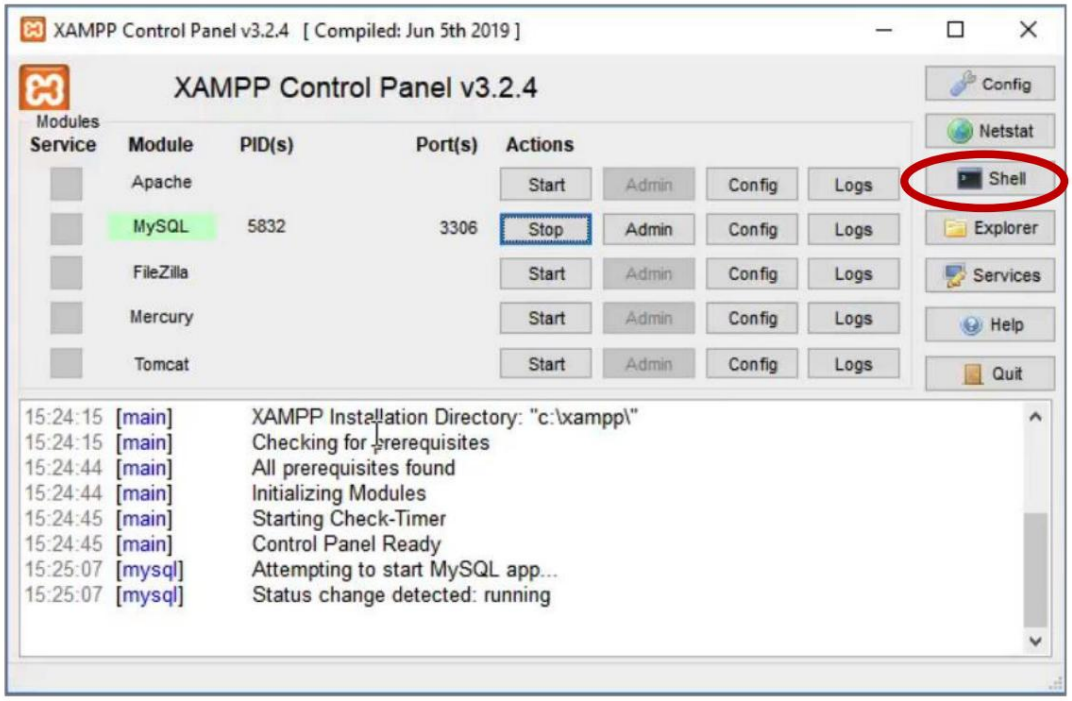


Figure 10. Shell terminal enable option for the database management environment

3. In the terminal window that will appear, **your connection to the MySQL environment is expected.** Run the login command:

```
# mysql -u root
MariaDB [<none>]>
```

4. After changing the prompt from # to **MariaDB [<none>]>** you are in the MySQL database management environment and can use SQL commands. First, run the following command to list the databases (DBs) already on your system:

```
MariaDB [<none>]> show databases?
```

5. To **log out** of the MySQL environment, run:

```
MariaDB [<none>]> exit
#
```

MySQL Workbench software

As an alternative to using the shell terminal to manage databases in MySQL, there is MySQL Workbench open source software. Here are guides to installing, configuring and using the software.

A. Installation

NOTE: The following steps do not need to be implemented for the lab PCs.

1. Visit the link https://dev.mysql.com/downloads/workbench/ and proceed to **save (download)** the newest version of the MySQL Workbench software, depending on the operating system of your PC. For more details you can consult the guide: 04_workbench_download.mov

2. Locate the file on your computer, confirm that it has been saved correctly, and **run** it to start the installation process. For more details you can consult the guide: 05_workbench_installation.mov

3. For the correct operation of the MySQL Workbench software on systems with the WinOS operating system, the installation of the Visual C++ add-on **is required .** For more details you can consult the guides: 06_vc++2019_download.mov and 07_vc++2019_installation.mov

B. MySQL Workbench initial setup and first use

1. Locate the MySQL workbench call file and **run** it. The initial screen of the software is shown in Figure 11. For more details about the first use of the software you can consult the guide: 08_workbench_first_use.mov

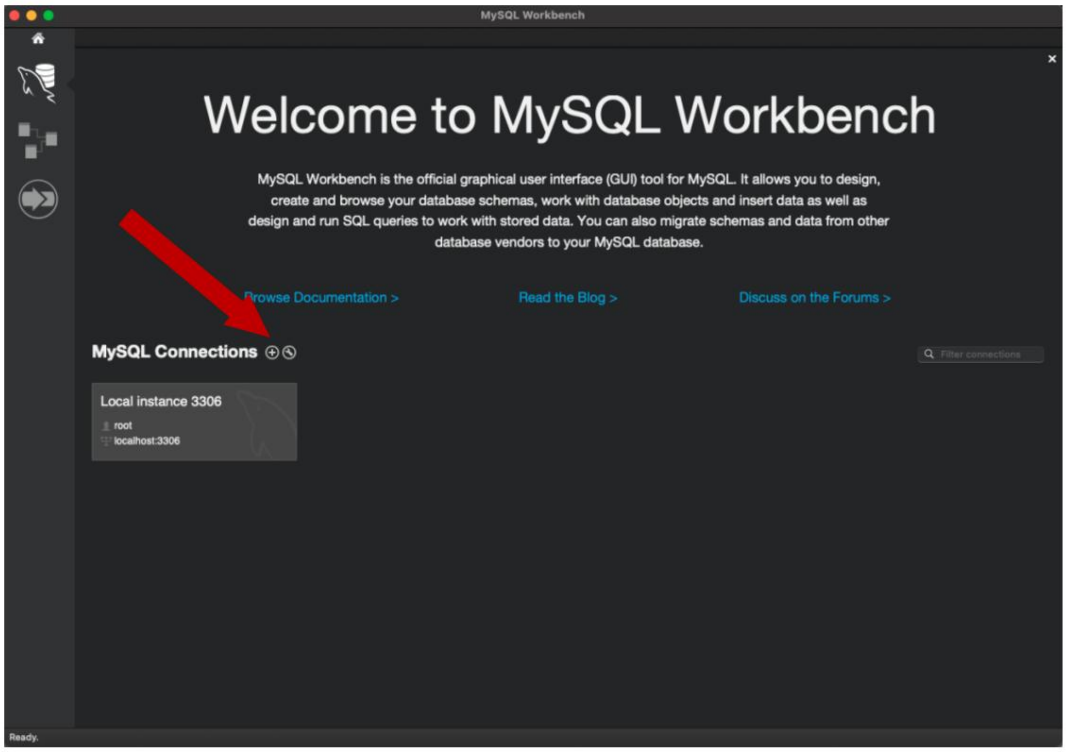


Figure 11. MySQL Workbench home screen

2. In the **MySQL Connections** area you can create a connection icon (instance) for the MySQL environment of a system. Select the icon (Figure 11) to add your system's MySQL instance. The **Setup New Connection** window will appear , as shown in Figure 12.

3. In the **Connection Name** box you can assign a name to the connection icon and in the **Hostname** box set the word localhost.

NOTE: The creation of the connection icon (instance) is done **once** and the instance exists for use. You do not need to perform steps 2 and 3 again in the future.

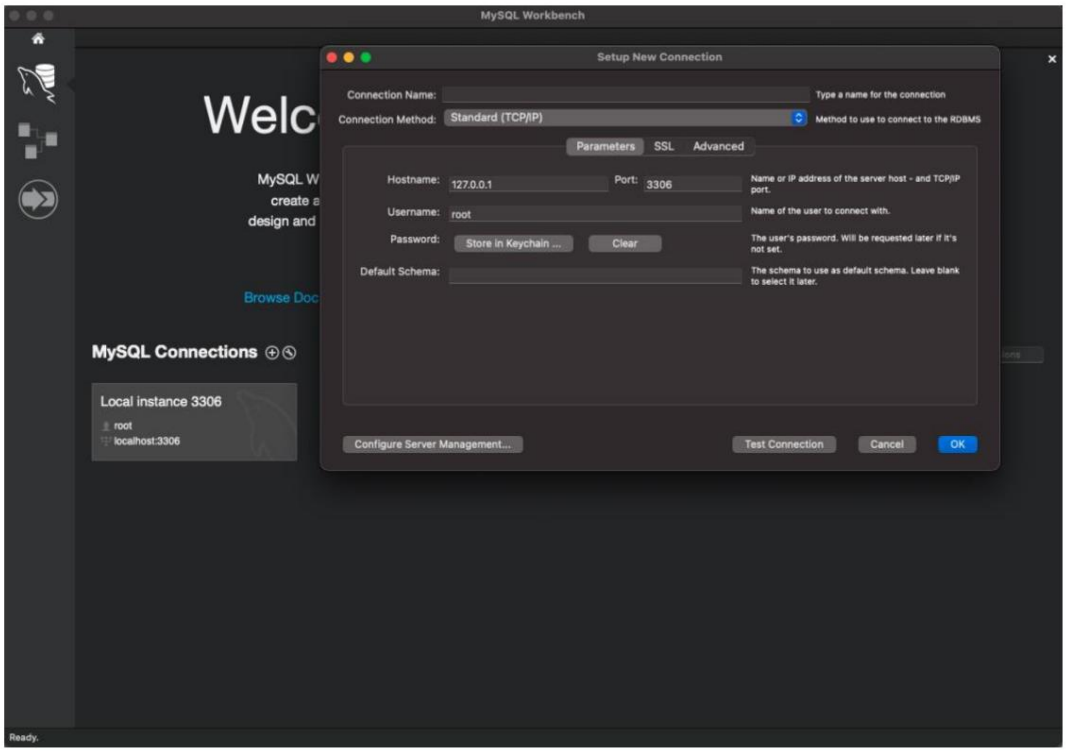


Figure 12. Window for creating an instance

4. On the initial screen of the software, select the instance we created in steps 2 and 3 and go to the **main** system database management environment, as shown in Figure 13.

5. Selecting **Schemas** displays a list of databases already created in the system, as shown in Figure 14.

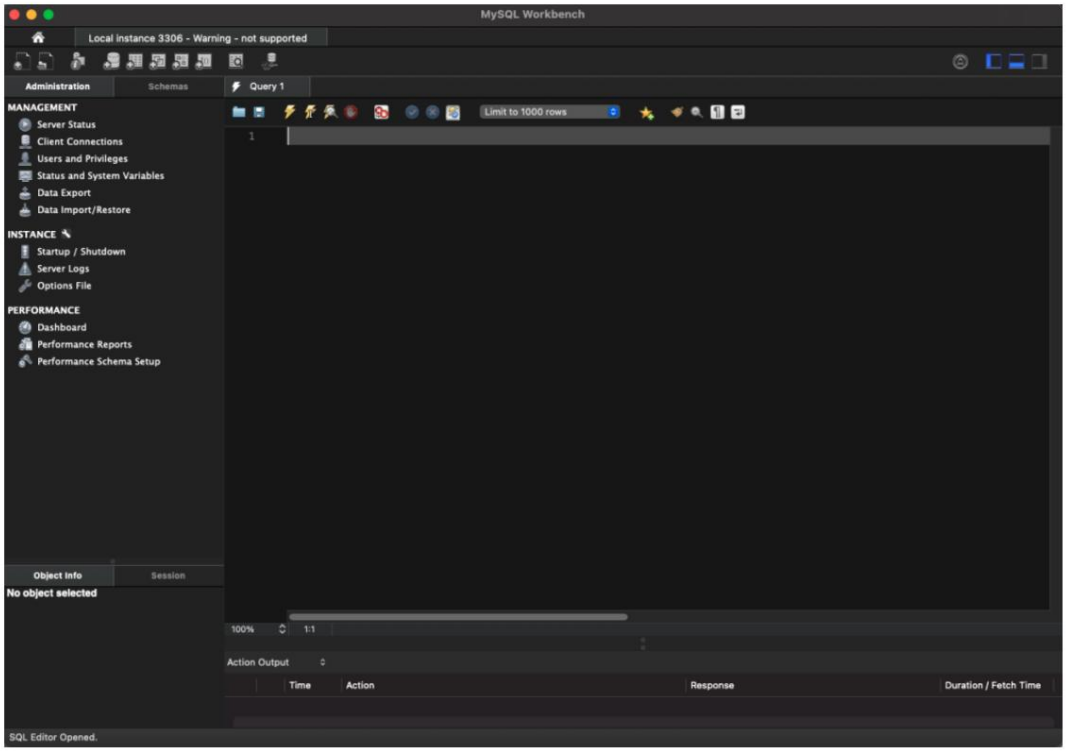


Figure 13. MySQL Workbench environment

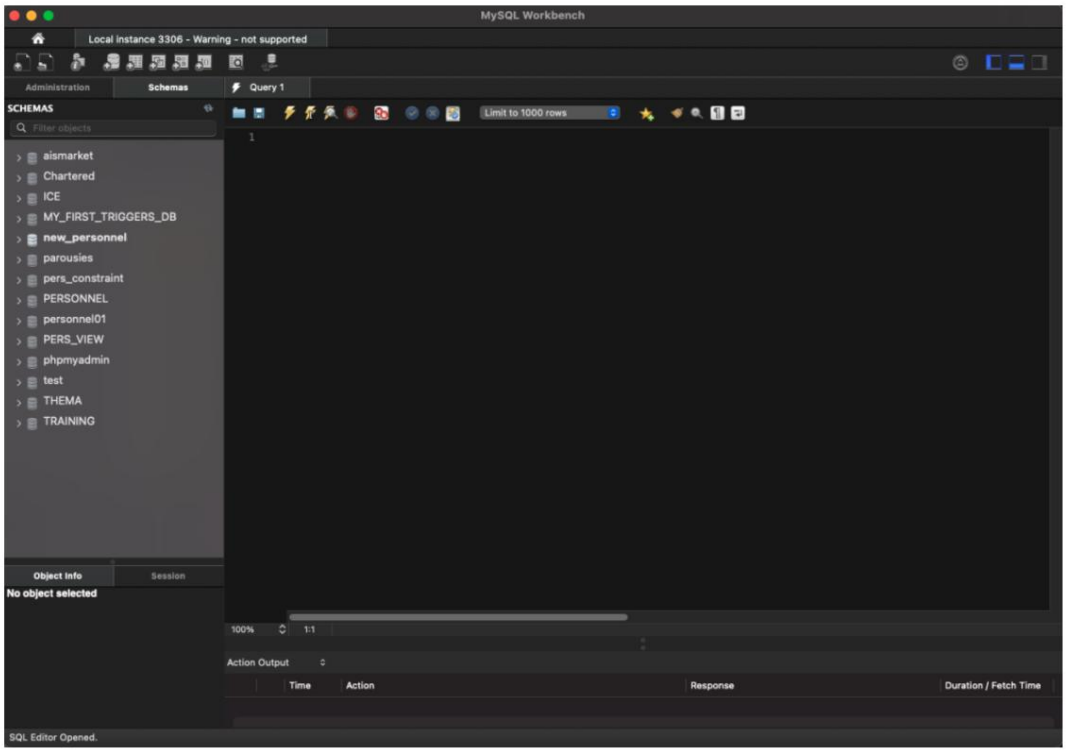


Figure 14. Schemas

6. By selecting Query1 we go to a text box where we can use SQL commands. Type the command to display the databases (DBs) already on your system:

```
show databases?
```

Then we select the execute shortcut icon and the result appears, as shown in Figure 15.

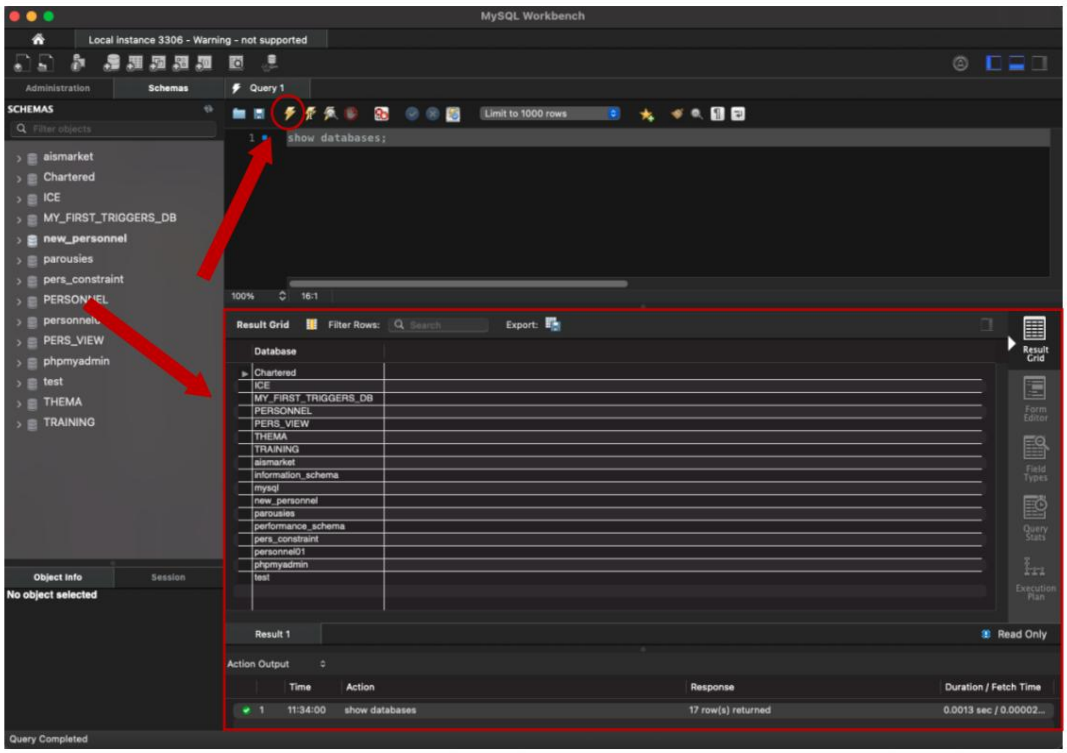


Figure 15. Query syntax and execution

7. Optionally and for the convenience of those with WinOS systems, you can create shortcut icons for the xampp control panel and MySQL Workbench and set administrator rights. For more details you can consult the guide: shortcuts_admin_rights.mov

Connect to MySQL on the lab systems

1. Activate a terminal window **(Command Prompt)** on the system.

2. Login to MySQL with **username: u1,** with the following command:

```
C:\> "C:\Program Files\MySQL\MySQL Server 8.0\bin\mysql.exe" --default-character-set=utf8mb4 -u
u1 -p
```

3. Then enter the password of the user u1.

```
C:\> "C:\Program Files\MySQL\MySQL Server 8.0\bin\mysql.exe" --default-character-set=utf8mb4 -u u1 -p

Enter password: *****
mysql>
```

4. As an alternative to steps 1-2, use the shortcut icon of the script **mysql_u1.cmd,** which is on the Desktop of the laboratory PC.

Activities

Carry out the following activities. The command or commands required for the implementation of each step, as well as the result of its execution should be included in a deliverable file in text or screenshot format. The file or files with your answers should be compressed into a **xx_ÿÿÿÿÿ_EPONYMO.zip,** where: (a) xx is the number of the section you belong to (e.g. for group [02] MONDAY 12:00-13 :00, **xx = 02)** and (b) YYYYYY your Registration Number. This final file will be submitted to the e-class -> DATABASES II -> Assignments.

1. **Connect** to your system's MySQL using any of the above methods you wish.

2. Check if there is a DB with the name **personnel.** If it doesn't exist, create it.

```
# Display NW
show databases?

# Create ND personnel
create database personnel?
```

3. Select the NW personnel to **use.**

```
# Select personnel to use
use personnel?
```

4. Ensure that personnel **has no** contained tables. If it has, delete them.

```
# Display tables
show tables?

# Delete table named onoma_pinaka
drop table onoma_pinaka;
```

5. Create the **DEPT, JOB** and **EMP** tables with primary and foreign keys.

```
# Create table DEPT
create table DEPT(DEPTNO int(2) not null, DNAME varchar(30), LOC varchar(30),
primary key(DEPTNO));

# Check result, display DEPT array structure
describe DEPT?
```

6. Display the details (EMPNO, NAME, JOB_DESCR, SAL, DEPT_NO) of those working as salesmen (SALESMAN).

7. Display by executing a command: (a) the maximum salary of all employees, (b) the minimum salary of all employees, (c) the average salary of all employees, (d) the number of employees who have a salary, (e) the number of employees who have a commission and (f) how many employees there are in total.

8. Display by executing a command: (a) maximum salary and (b) average salary of they work as analysts (ANALYST).

9. Display the details (EMPNO, NAME, JOB_DESCR, SAL, DEPT_NO) of those who work as analysts (ANALYST) and their salary (SAL) ranges from 1000 euros to 2500 euros.

10. Display the details (EMPNO, NAME, JOB_DESCR, SAL, DEPT_NO) of the employees who their first and last name (NAME) contains the letter R (or ÿ if you have entered data in Greek characters).

11. Display details (EMPNO, NAME, JOB_DESCR, SAL, DEPT_NO) of employees sorted by department (DEPT_NO) and salary (SAL).

12. Display the average salary and number of employees per department.

NW personnel

The tables contained in the personnel database should have the following structure and contents:

Emp

EMPNO	NAME	JOBNO	DEPTNO	COMM
10	ΣΠΥΡΟΥ	100	50	450
20	ΧΡΗΣΤΟΥ	200	50	
30	ΝΙΚΟΥ	300	60	
40	ΣΠΥΡΟΥ	200	50	

Job

JOBCODE	JOB_DESCR	SAL
100	ΠΩΛΗΤΗΣ	2200
200	ΑΝΑΛΥΤΗΣ	2000
300	ΧΕΙΡΙΣΤΗΣ	1000

Dept

DEPTNO	DNAME	LOC
50	ΠΩΛΗΣΕΙΣ	ΑΘΗΝΑ
60	ΛΟΓΙΣΤΗΡΙΟ	ΑΘΗΝΑ
70	ΜΙΣΘΟΔΟΣΙΑ	ΒΟΛΟΣ