Bases de Dades
Database Software Installation & Setup

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1 Database Software Installation & Setup

The main goal of the practical is to install the necessary software to perform the practicals and exercises of design of Entity-Relation schemes, and subsequent relational databases. This software is also necessary to design the SQL queries for DB exploitation.

We have opted for using two separate programs, designed around the MySQL Database software:

1. The Community MySQL Server 8.0.
2. The MySQL Workbench.

These two pieces of software may be installed in computers running OSX, Windows and Linux. The procedure to install them for each of these distributions is described next.

2 MySQL Setup for MacOS

This is a brief tutorial/guide that explains how to install the two main professional packages to use a MySQL database server: the MySQL-server 8.0, community edition, and the MySQL Workbench 8.0.22 (not 8.0.23!).

Note: Please, make sure that you install the community editions (CE) of the software; these are the only ones we have legal permission to use.

Fortunately for MacOS users, there is a native package that may facilitate the server's installation, so it's just a matter of downloading the right file and following up until its installation:

1. Open a browser and connect to the following url:

   https://dev.mysql.com/downloads/mysql/

   Select your Operating System (macOS) and download the macOS 10.15 DMG Archive and follow the instructions to set it up.

2. Once you select the file to download, you will be asked to login onto your account. You don't need to do so, just click on the link below: "No thanks, just start download." That should start the download process.

3. Then you should be asked to either save the .dmg file or to open it with DiskImageMounter. I suggest the latter option, as saving the file has no use beyond installation.

4. That should decompress the .pkg file containing the macos installer. Agree on everything on the installation and that should end up with your mysql community server rightfully installed in your macos system.

5. It will give you the option of using Strong Password Encryption. Please use that to minimize the change of your server being hacked.

Installing MySQL Workbench

To install the MySQL Workbench you will need to follow this process:

1. Open a browser and connect to the following URL:

   https://dev.mysql.com/downloads/workbench/

2. Select the macOS (x86, 64-bit) DMG Archive to be downloaded and follow the same process as for the server.

Accessing the Databases

To access the DBs you will have to create a password to access the DBs. To that end, once both programmes have been installed, follow the next steps:

1. Go to the apps directory on your mac, and click on MySQL.

2. Click on "Initialize Database"

3. Choose a good password (you know, letter, number + symbol, nonsensical combination if possible, but something you may easily remember). This is going to be the password for the 'root' user.

4. When doing so, that should automatically shutdown the server. Click on the Button "Start MySQL Server" to re-start the service.

At this point you should be able to access the Server either by opening a Terminal and entering the DB Server, or by executing the MySQL Workbench and creating a connection to the server.

To test, open a terminal and click in the following command:

```
mysql -u root -p
```

When clicking enter, you will be requested the same password you entered during the DB initialization. Once that is done, you are into the server and can use any of the SQL commands we will be testing in the next sessions.

I am adding a couple YouTube tutorials for you to check and explore. I very much recommend this one, since it provides a detailed explanation of how to install both the server, and mysql server, as well a demo of how to connect to the server:

https://www.youtube.com/watch?v=9sbUsbDWTE8

Other Tutorial Guides:

https://dev.mysql.com/doc/mysql-osx-excerpt/5.7/en/osx-installation.html

https://www.youtube.com/watch?v=UcpHkYfWarM

How to create a new user

1. Open a terminal and connect to the server as root:

```
mysql -u root -p
```

2. Insert the name, and password of the new user:

```
CREATE USER 'demouser'@'localhost' IDENTIFIED BY 'password';
FLUSH PRIVILEGES;
```

3. If you want the user to have superuser rights (recommended in our case), run the following command:

```
GRANT ALL PRIVILEGES ON *.* to demouser@localhost;
FLUSH PRIVILEGES;
```

3 MySQL Setup for K/Ubuntu Linux

This is a brief tutorial/guide that explains how to install the two main professional packages to use a MySQL database server: the MySQL-server 8.0, community edition, and the MySQL Workbench.

Note: Please, make sure that you install the community editions (CE) of the software; these are the only ones we have legal permission to use.

For Linux users, I recommend you to use the apt-get command to install the server:

1. Open a terminal and type down the following commands:

```
sudo apt update
sudo apt install mysql-server
```

   If your repositories are up-to-date, that should go through with the installation of the MySQL server and dependencies quite painlessly. If the secure installation does not start right away, you may run the following command on the terminal:

```
sudo mysql_secure_installation utility
```

   At this point you will have to add the level of security you require. We recommend using Strong Password Encryption to prevent the risk of your server being hacked.

2. Configure MySQL to use a password for the root user.

```
sudo mysql
```

```
ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'new_password';
FLUSH PRIVILEGES;
```

3. Once the installation is done, you need to keep in mind that the server can be started and shutdown at your convenience with the following commands:

```
sudo systemctl start/stop/restart mysql
```

4. If you want the server to be up and running at computer start up, you may also execute the following command (that is indeed recommended):

```
sudo systemctl enable mysql
```

I am adding a couple youtube tutorials for you to check and explore. I very much recommend this owner, step-by-step, it provides a safe explanation of how to get the server and client running right away:

https://support.rackspace.com/how-to/install-mysql-server-on-the-ubuntu-operating-system/

Another Tutorial/Guide:

https://websiteforstudents.com/install-mysql-8-0-on-ubuntu-16-04-17-10-18-04/

Installing MySQL Workbench

On the other hand, to install the MySQL Workbench for Ubuntu, you can execute:

```
sudo apt update
sudo apt install mysql-workbench-community
```

If the package is not available in your repository, you can download it from https://dev.mysql.com/downloads/ and install it manual using the `dpkg` command.

Accessing the Databases

To access the Dbs, you will have to create a password to access the DBs. To that end, once both programmes have been installed, follow the next steps:

1. Open a terminal and connect to the server by calling the mysql-client (or just mysql command):

   ```
   /usr/bin/mysql -u root -p
   ```

   you will have to provide the password you defined during the installation process.

2. At this point you should see the prompt from the server on the shell:

   ```
   mysql>
   ```

How to create a new user

1. Open a terminal and connect to the server as root:

   ```
   mysql -u root -p
   ```

2. Insert the name and password of the new user:

   ```
   CREATE USER 'demouser'@'localhost' IDENTIFIED BY 'password';
   FLUSH PRIVILEGES;
   ```

3. If you want the user to have superuser rights (recommended in our case), run the following command:

   ```
   GRANT ALL PRIVILEGES ON *.* to demouser@localhost;
   FLUSH PRIVILEGES;
   ```

4 MySQL Setup for Microsoft Windows

This is a brief tutorial/guide that explains how to install the two main professional packages to use a MySQL database server: the MySQL-server 8.0, community edition, and the MySQL Workbench.

Note: Please, make sure that you install the community editions (CE) of the software; these are the only ones we have legal permission to use.

Open a browser and connect to the following url:

https://dev.mysql.com/downloads/mysql/

Select your Operating System (Microsoft Windows) and download the appropriate file: Windows (x86, 32-bit), MSI Installer or Windows (x86, 64-bit), ZIP Archive.

Note that in both cases, a light and a heavy version are available. In the former, internet connection is needed to download the appropriate packages. This tutorial covers heavy version installation that is the recommended one.

Once you select the file to download, you will be asked to login onto your account, but this is not strictly required and can be skipped.

When downloading is finished you will get an executable installation file at your browser's download folder. Double click the icon to execute.

During the installation (at least in the heavy version), if you use the "Developer Default" option, the MySQL Workbench will be installed at the same time than the MySQL-server. You can follow the following url to guide you during the installation process:

https://www.youtube.com/watch?v=hhswRLo4NTI

Note that the password for the superuser (i.e. root) will be introduced during this process. Also, the MySQL server can be configured to start automatically when starting the PC. The MySQL Notifier at the notification area will allow you to start/stop/restart the MySQL server.

Installation Steps

Then follow these steps to set it up. Keep Developer Default option selected and click Next. Then keep default folder paths and click Next.

You will be shown a list of products that are about to be installed. Click Execute and the installation will start. It will take some minutes.

Keep default Type and Networking options and click Next. Select Legacy MySQL 5.x Authentication Method and click Next.

The default root user of the Database must be created. If installer allows it check to use no password and click Next, otherwise choose a password and store it in a safe place (do not forget it). Blank or easy passwords must be highly discouraged for any professional DB use. Keep standard Windows Service options and click Next.

MySQL Server Configurations are ready to be applied, click Execute button and Finish when all ticks are shown.

Next step is MySQL router configuration. It should be checked that such a configuration is shown as "Configuration not needed". After that, it's necessary to configure the server connection. The user name to be checked is `root`, and password the one you created some steps before for your account (blank if allowed).

When completing the configuration of the server, the connection should be made. If connection succeeds, it will be shown as a green label as status of the server.

At this point, the SQL server is almost installed and already functional. Workbench tool is installed too as DB client interface application to work with your SQL server. Last step is running some script to include some sample databases on your MySQL Server (however, at this point we are not ready yet to write SQL code, we will go back to this in future sessions).

Now you can open workbench and get start to get used to the environment.

5 Introduction to MySQL (v.1.0)

The Management of the MySQL Server depends on correctly modifying a DB called `mysql`, which is first installed onto the MySQL data server. Therefore, to manage the DB you must first connect to the 'mysql' DB.

How to create a connection to the DB

- Open mysqlworkbench
- Click on the + symbol by "MySQL Connections" to create a new connection profile, adapted to the DB. Enter the fields:
  - Connection Name with a name representative of the DB you are accessing.
  - Enter the right username (root, guest...)
  - Fill in the Default Schema Field with the name of the DB you want to access. **IMPORTANT**: the schema should exist in advance. If no schemas have been created, leave this field blank.
  - Check your connection by clicking on the button 'Test Connection' to check that all parameters are correct.
  - Click on the button 'OK' to save it and on.

How to create a new DB user with all rights (superuser)?

1. First connect to the mysql DB.
2. Enter the following commands on the script editor:

```
create user 'username'@'localhost' identified by '';
grant all privileges on *.* to 'username'@'localhost';
flush privileges;
```

Change from one DB to another one

Command: `use 'dbname';`

Show the list of tables

Command: `show tables;`

Import Data into DB

In order to import an existing DB in the MySQL workbench, go to Server→Data Import→Import from Self-Contained File (Import from Disk tab), and enter the `sql` file containing the DB backup or DB definition. Currently, we do not have any `sql` file available, but we will work with some soon.