CSCI 332 Database Concepts
Fall 2020
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Laboratory 1 Database Queries using MySQLWorkbench

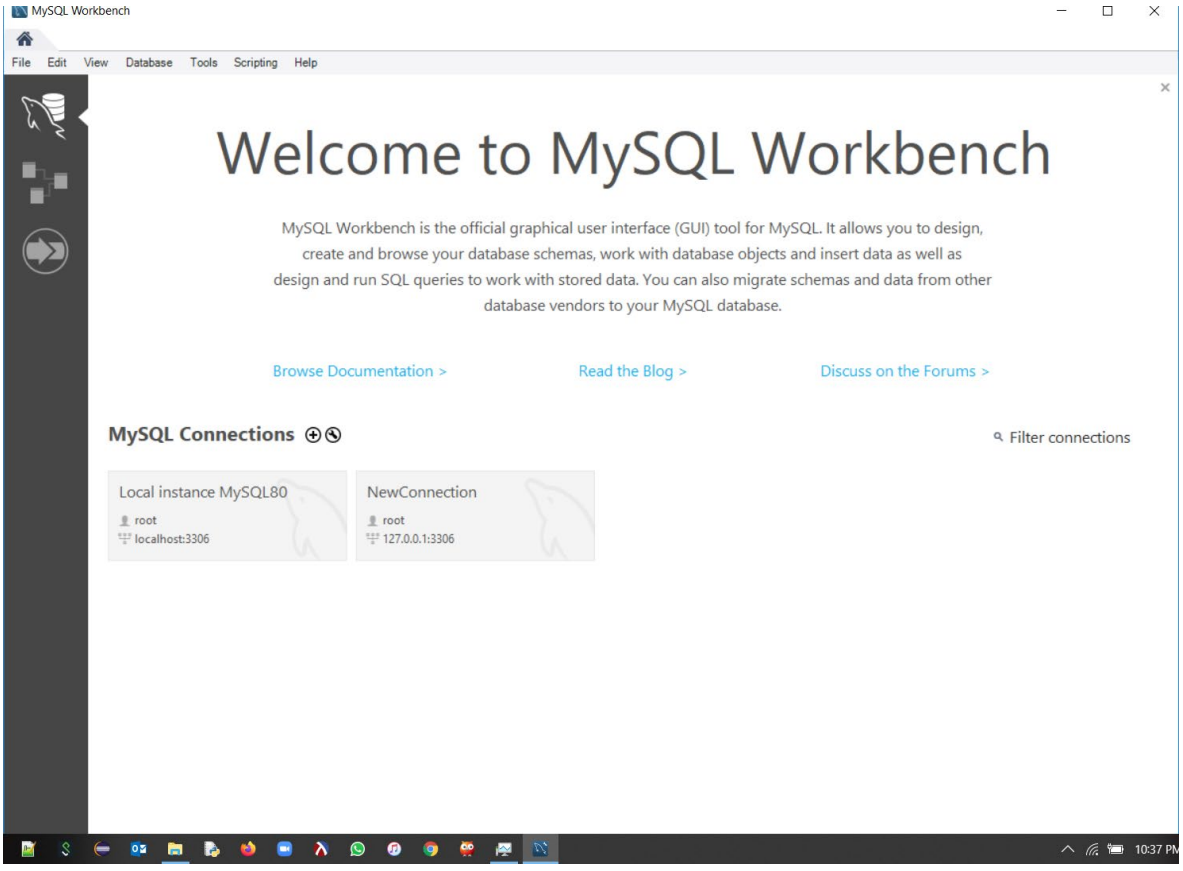
In this lab we discuss how to perform database queries in SQL using MySQL Workbench. In order to do so, however, we must first have a database with which to perform the queries, so we begin with how to install a database in on a running mysql system using MySQL Workbench and a backup of the database.

Database installation is normally not a task performed by a general user of a database that is intended for concurrent use by multiple users. Rather, it is an administrative task carried out by a database administrator. With MySQL running on your system, you are that administrator.

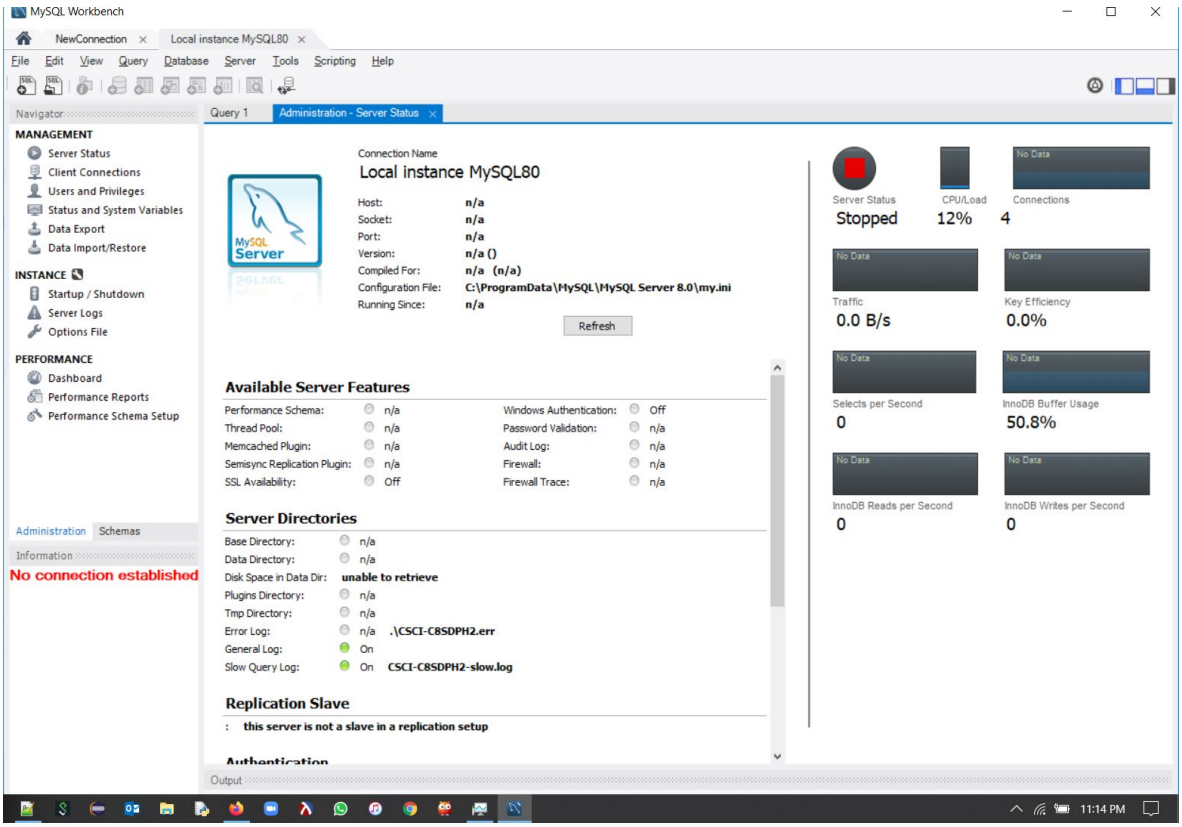
Starting MySQL Server on Your System

Before we begin this task we must have an instance of an MySQL Server instance process running on our system. This is accomplished by starting an instance of the process mysqld on your system. For this lab we will accomplish this through MySQL.

1. Start MySQL Workbench on your system via Launchpad (for macOS systems) via the Start menu or a taskbar item on Windows. When this has been done you should see a window similar to the following:

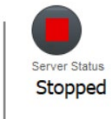


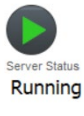
2. Click on the Local Instance item in this interface. You will most likely see one of the following two windows. Either the Administration - Server Status Window:



or the Schemas window.

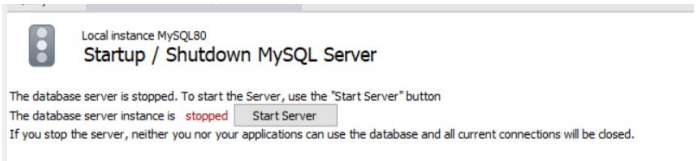
If you see the **Schemas** window, then find the **Administration** tab on the left side of the window and click it, and then click the Server Status entry on the upper left hand side, right under the **Management** heading.

3. Look to the right to see whether your server is stopped 

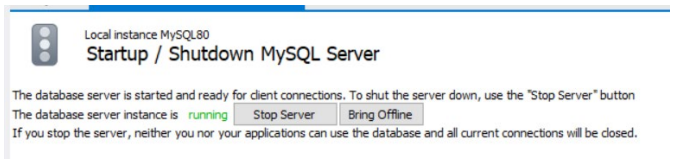
or 

running

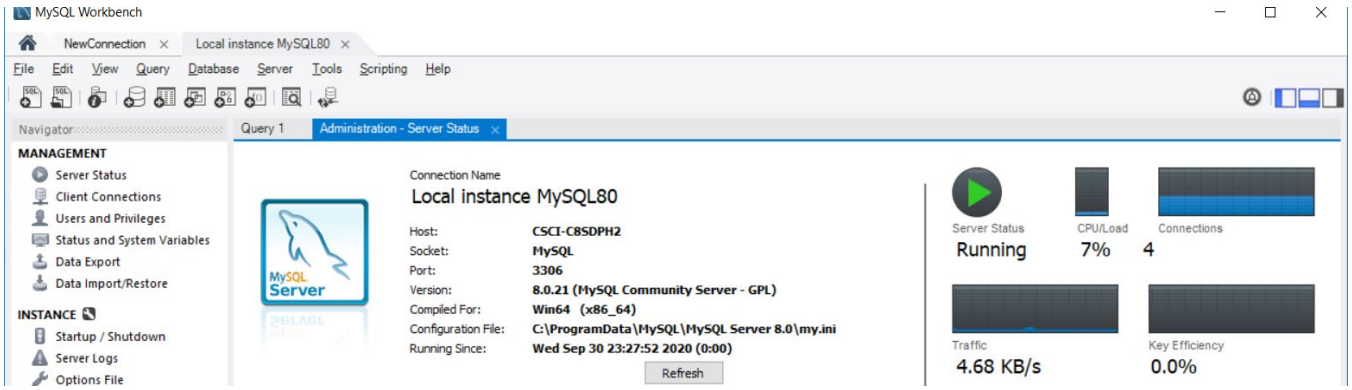
4. If the server is running, there is nothing to do. If the server is stopped, however, we must start it.
   a. On the far left side of the interface, under the **Instance** heading, click on the **Startup/Shutdown** entry.
   b. Near the top middle of the ensuing window you will find an entry similar to the following



   c. Click on the Start/Server button. You may be asked to enter your root password. Once this has been entered you should see that the database server instance is now running



and if you click on the Server Status entry (under Management) near the upper left of the window you should see the following

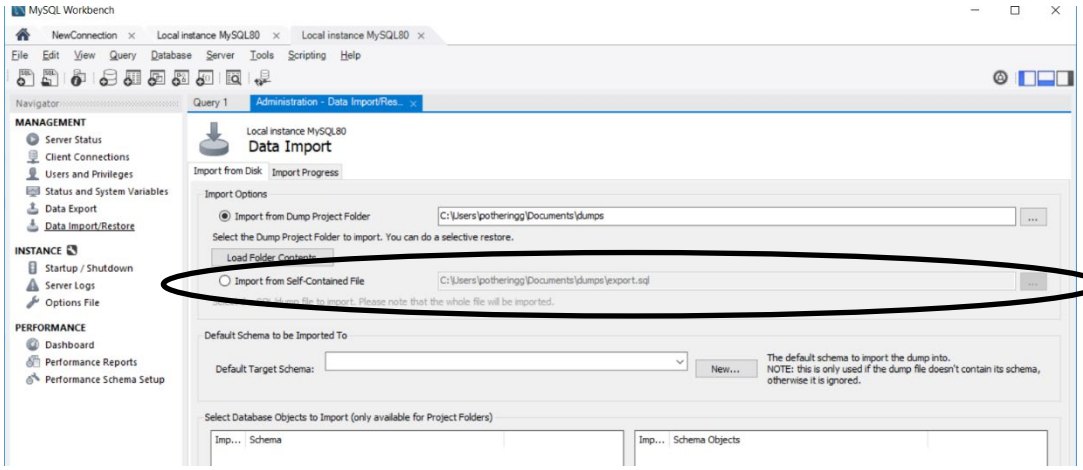


Importing a Database

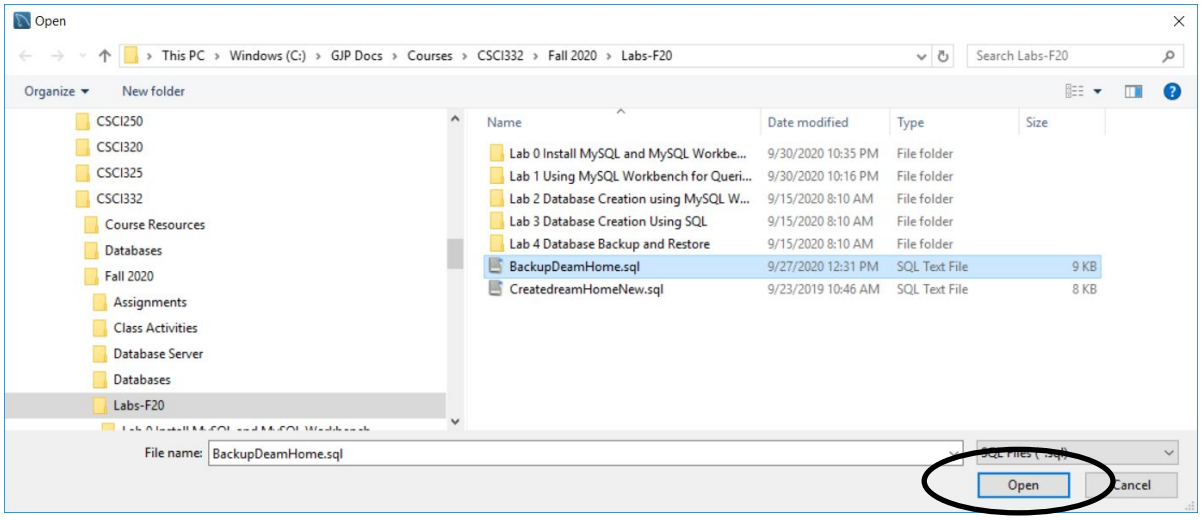
One can use a backup of a database file either to create a new database from it or to restore data to an existing database. The steps are essentially the same for both, so we shall focus on the former for now. The database we are going to create is based on the backup file **CreateDreamHomeDB.sql** on OAKS. You should download this file to a directory of your choice.

First we create a database instance for the database you want to create from a backup. We are going to create one called **dreamhome** based on the database being used in our textbook. We are also assuming Workbench shows the Administrative/Server status window from the previous section.

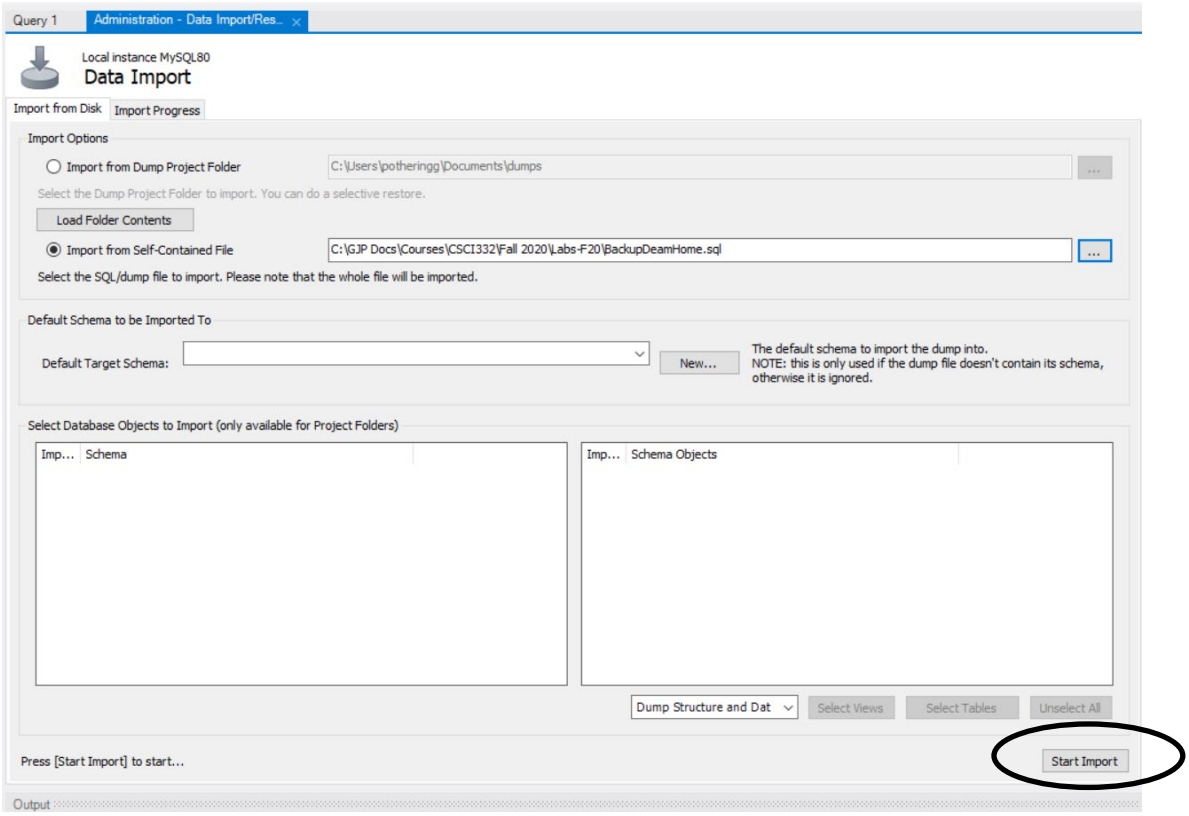
1. On the far left of the window, click the **Data Import/Restore** entry, which is the last one under **Management**. This should change your window to the following.



2. Now click in the Import From self-Contained File entry (just under the Load Folder Contents button, circled above), and then click on the far-right button showing the ellipsis … and then navigate to the folder where you stored the BackupDreamHome.sql backup file you were given.

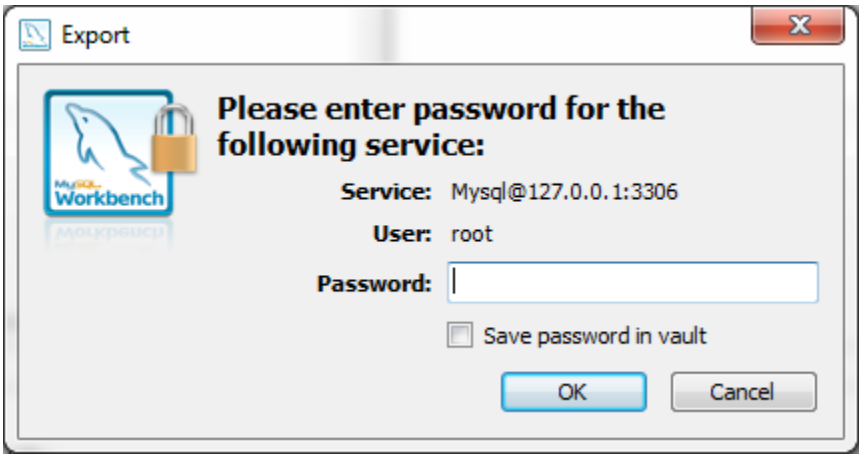


3. Click on the filename to select it, then click on the Open button to return to the Data Import window.

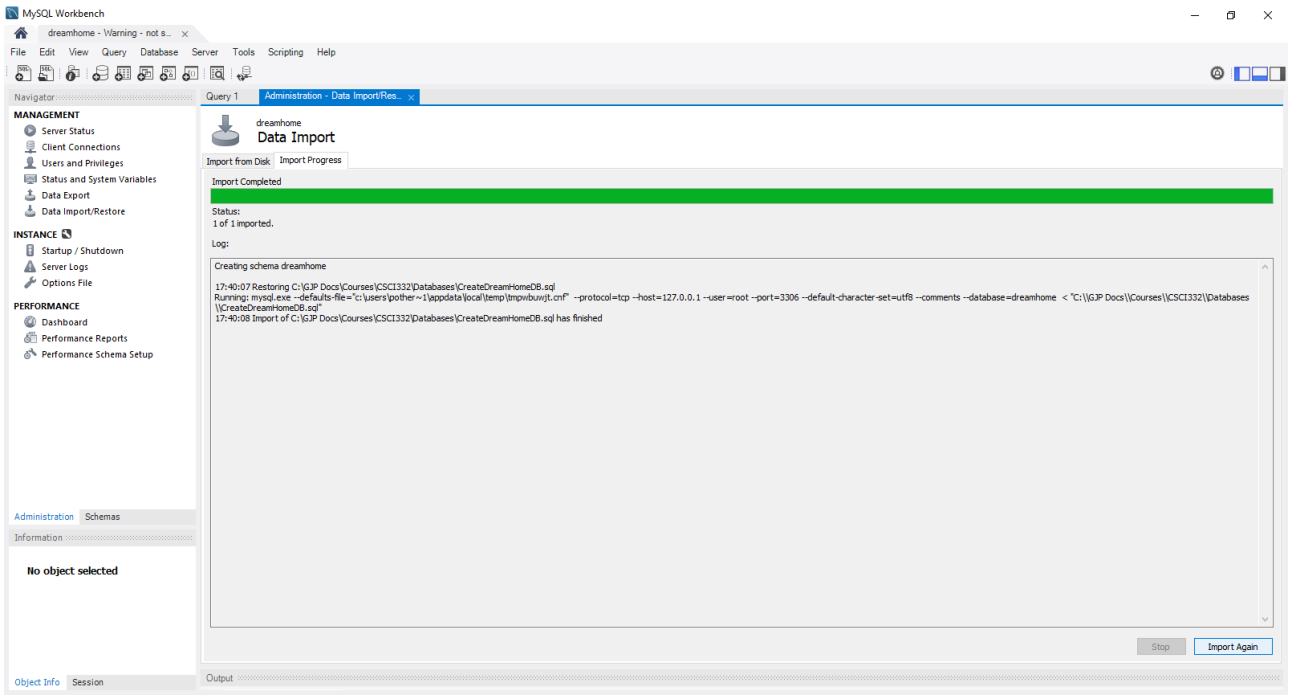


4. Click the **Start Import** button. **Note:** Some of you may see a window where you will be asked to enter a password for user root (the default name for the administrator). If so, then enter the password you specified when you installed MySQL in Lab 0. (if you check the **Save password in vault** entry

you may be able to avoid this step in the future, although it may depend on the computer on which you are working)/

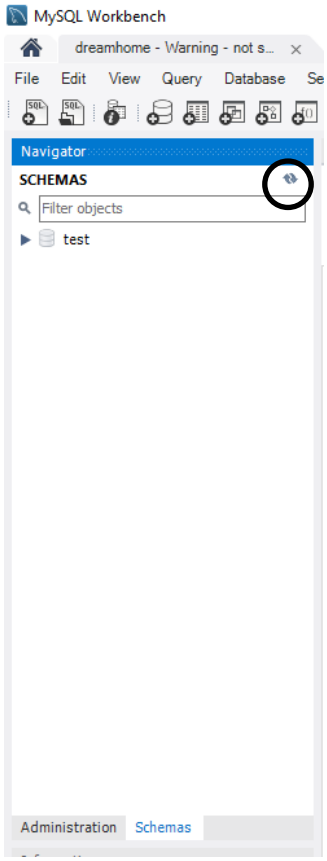


You should then see a progress window such as the following, with a green progress marker moving across the top component. You will then be in an **Import Progress** tab. When the import completes you will see a message to that effect in the **Import Progress** tab.

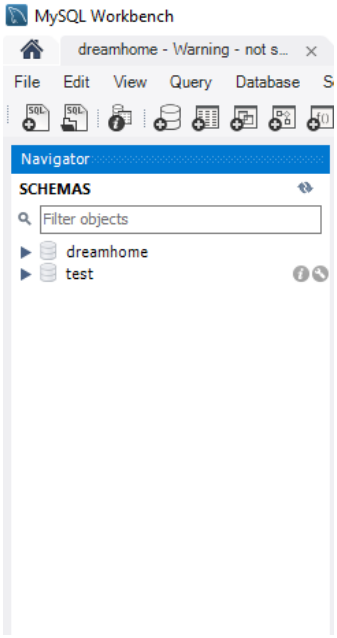


You can now close the **Administration tab** by clicking on the x on the tab (circled above).

3. Activate the Schemas subpanel by clicking on that tab in the left-hand panel, then click on, the Refresh icon in the **Schemas** subpanel in the leftmost panel (circled on the next page)



As a result the **dreamhome** database/schema should now appear in this panel (again, see below).

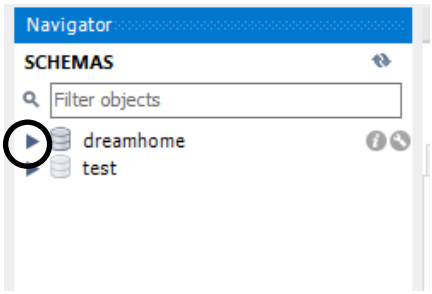


It is now ready to receive SQL requests from a Workbench user,

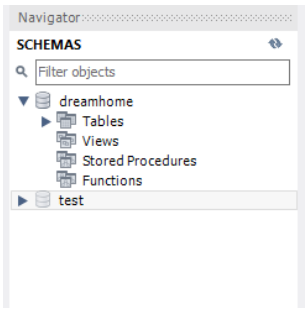
Seeing the Structure of Given Table (Two Ways)

Here we will see how we can discern the structure of a given table in a database. We will see how to do this using Workbench and then via SQL.

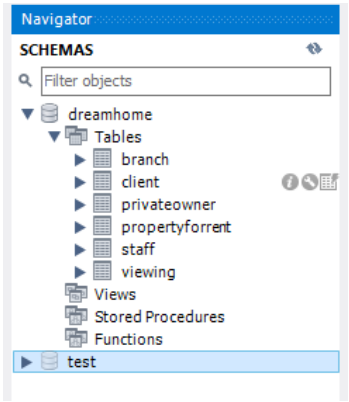
1. In the Schemas panel click small arrow to the left the the name dreamhome (circled below),



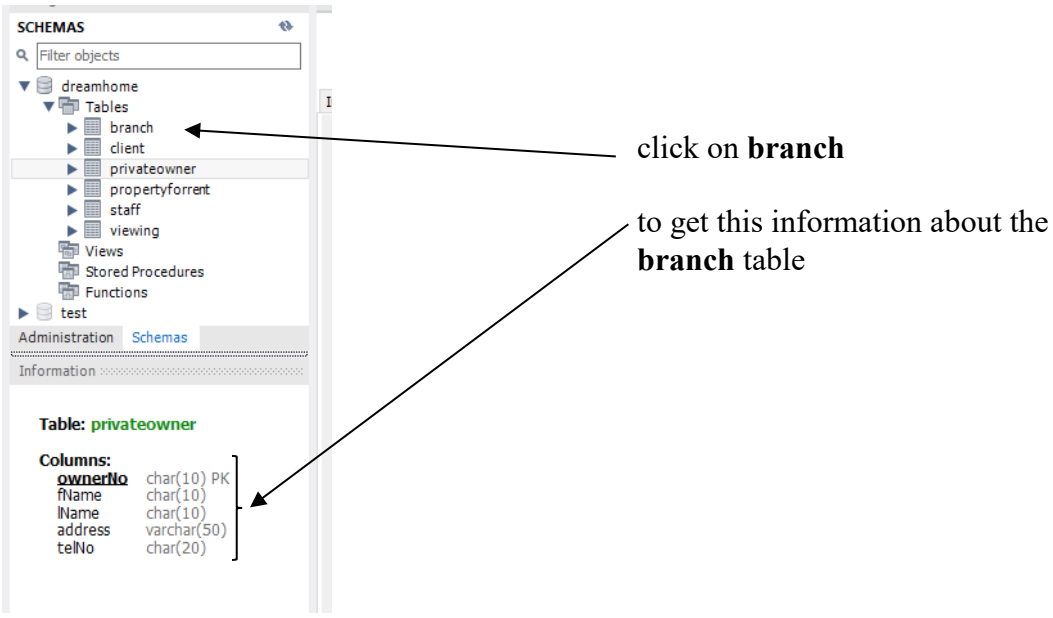
This will expand the dreamhome entry as shown here



2. Now do the same with the Tables entry. This will exand this entry to reveal all of dreamhome's relations.



3. If you now click on the ***branch*** table under the **dreamhomes** schema you will notice the content of the **Information** panel immediately below the **Navigation** panel reveals information about the structure of the ***branch*** table

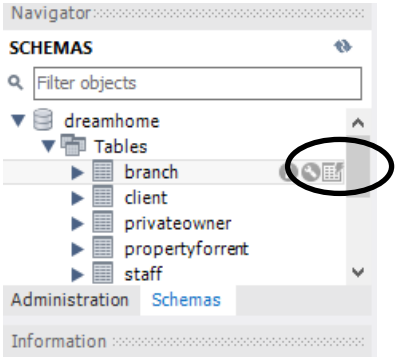


A few more points about the Inforrmation panel:

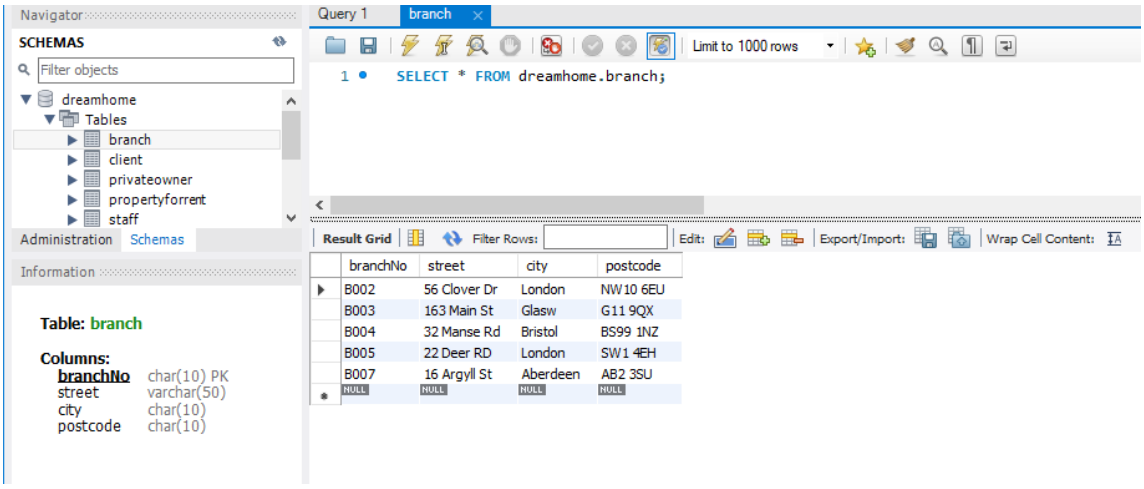
- The attribute names that are **bold underlined** are (part of) the primary key.
- Any attribute names simply in **bold** are foreign key attributes.

Viewing Tuples in a Table

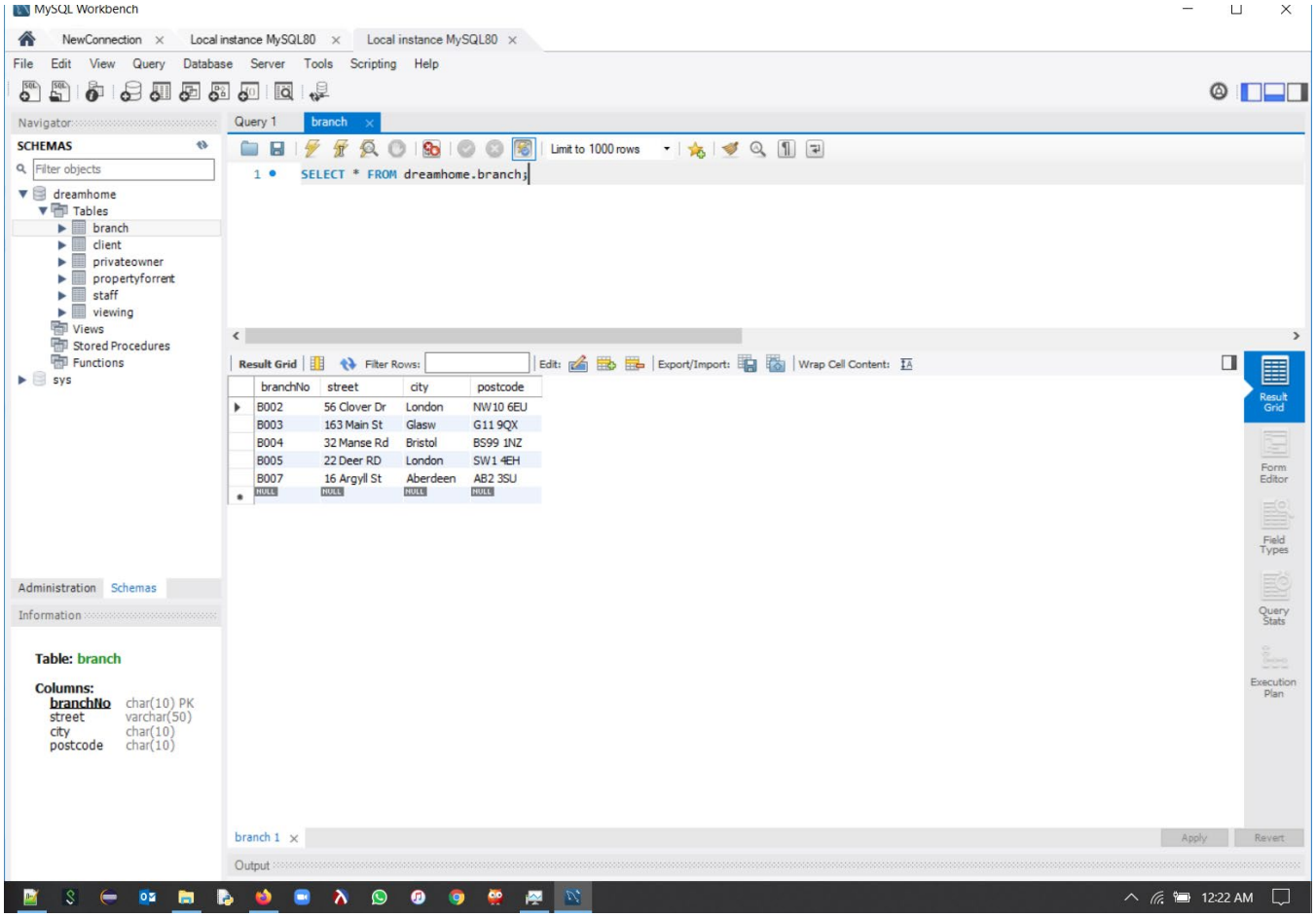
1. Place the cursor over the **branches** table in the Schema panel and let it hover there. You will see the image change to the following.



2. If you now click on the spreadsheet-like icon to the far right of the table name (see circled item above) you will see the information on the next page in the panels to the right.



Alternatively you could right-click on **branch** in the Schemas panel and then in the resulting pop-up listchoose Select Rows-Limit 1000 and see the same thing.

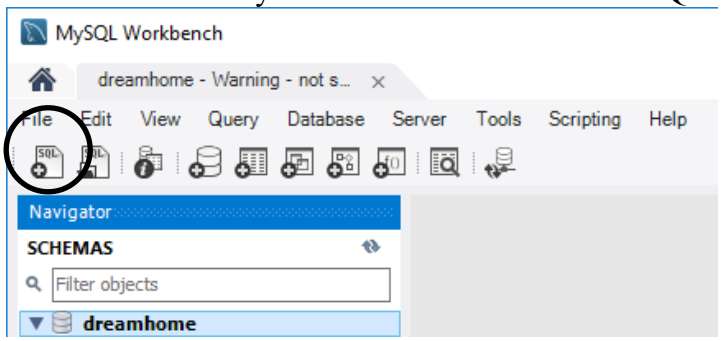


You should repeat steps 1 and 2 above for the remaining tables in **dreamhome** to get a good sense for the structure of the database as a whole. In the next part of this lab we will be using SQL commands to insert, delete, and update tuples in the database, so having a stromg grasp of the structure of the database is essential for carrying out these tasks correctly and effectively.

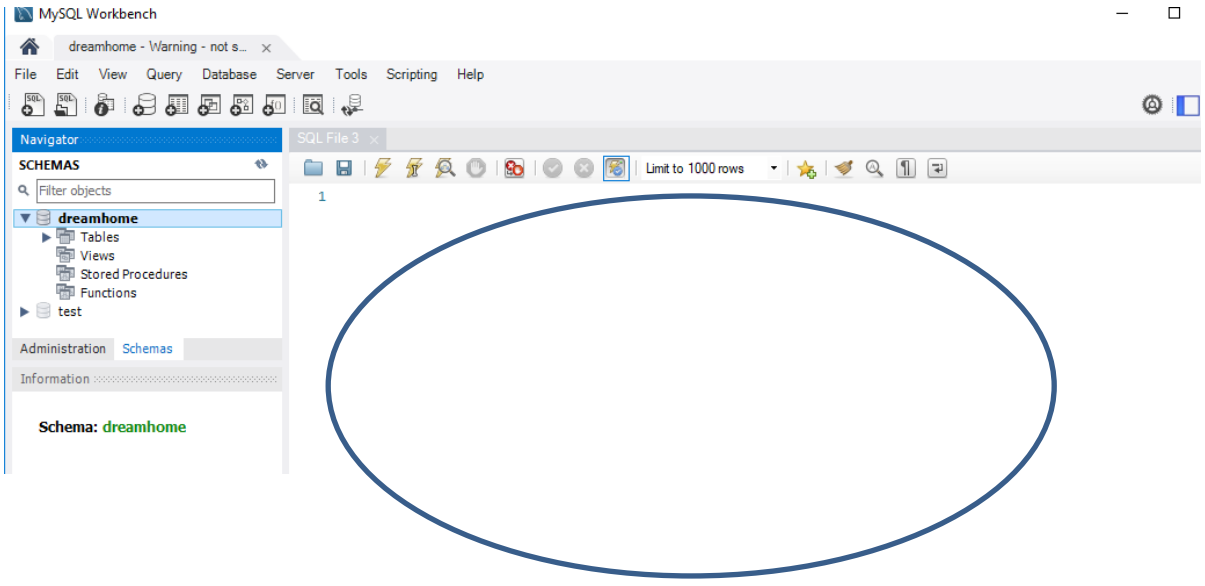
Running Data Queries in SQL

We conclude this lab by showing you how you can enter and run SQL queries on a database.

1. Near the top of the Workbench window you will see an icon labelled +SQL as shown circled below.



2. If you click on this it will open a query tab in the panel to the right of the Navigator panel (see below)



This is where you can type in SQL queries.

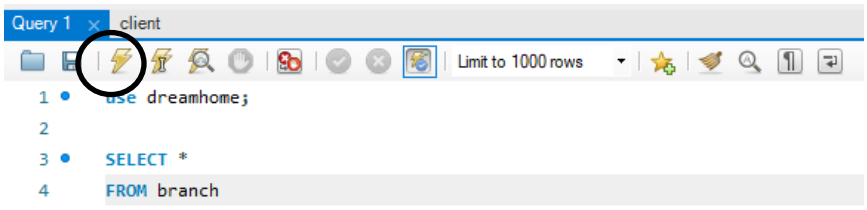
3. We'll begin with the simplest of queries "Give details of all branches." which, of course translates into SQL as

```
Select *
FROM branch;
```

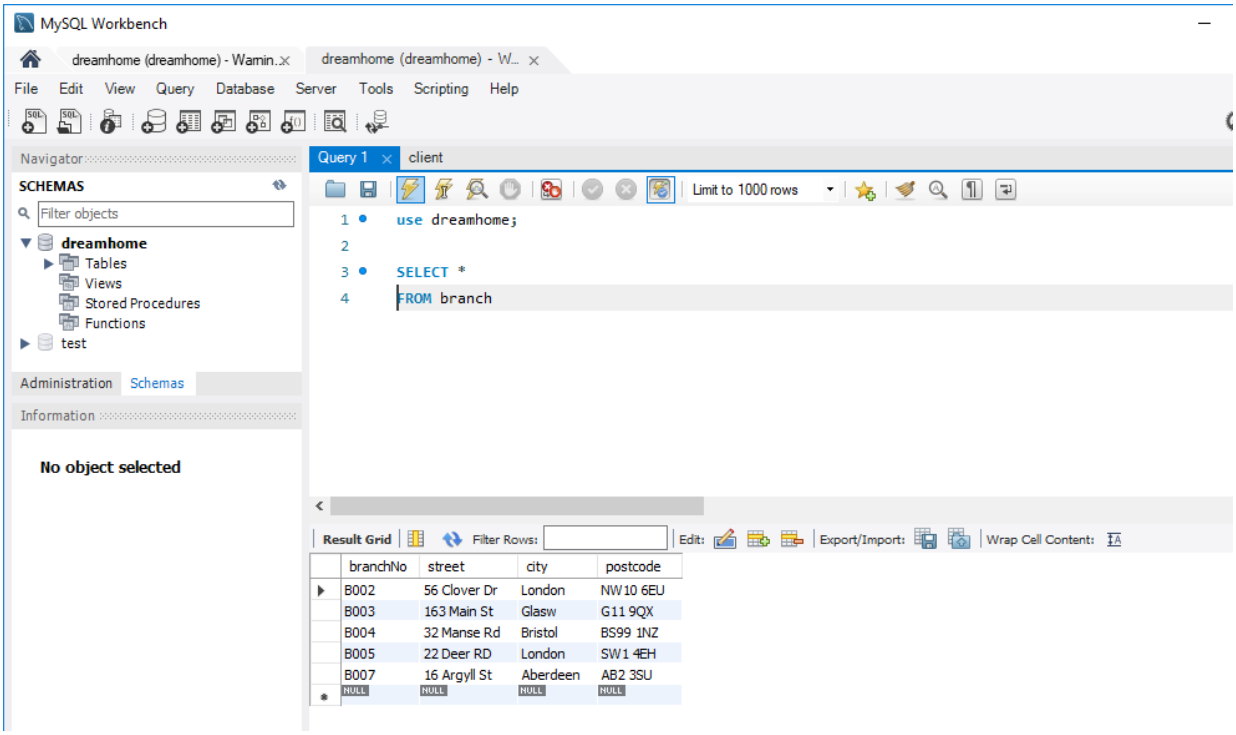
Before typing this in the query panel, however, we need to let SQL know that we want to work with the **dreamhome** database, so for the first line in the query panel enter

```
use dreamhome;
```

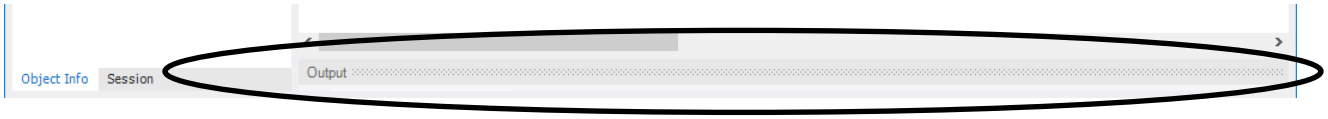
and then type the above query. This is shown in the following screen capture



4. Now click on the lightning bolt icon (circled above) to process your query. If you have no syntax or spelling errors you should get the following response



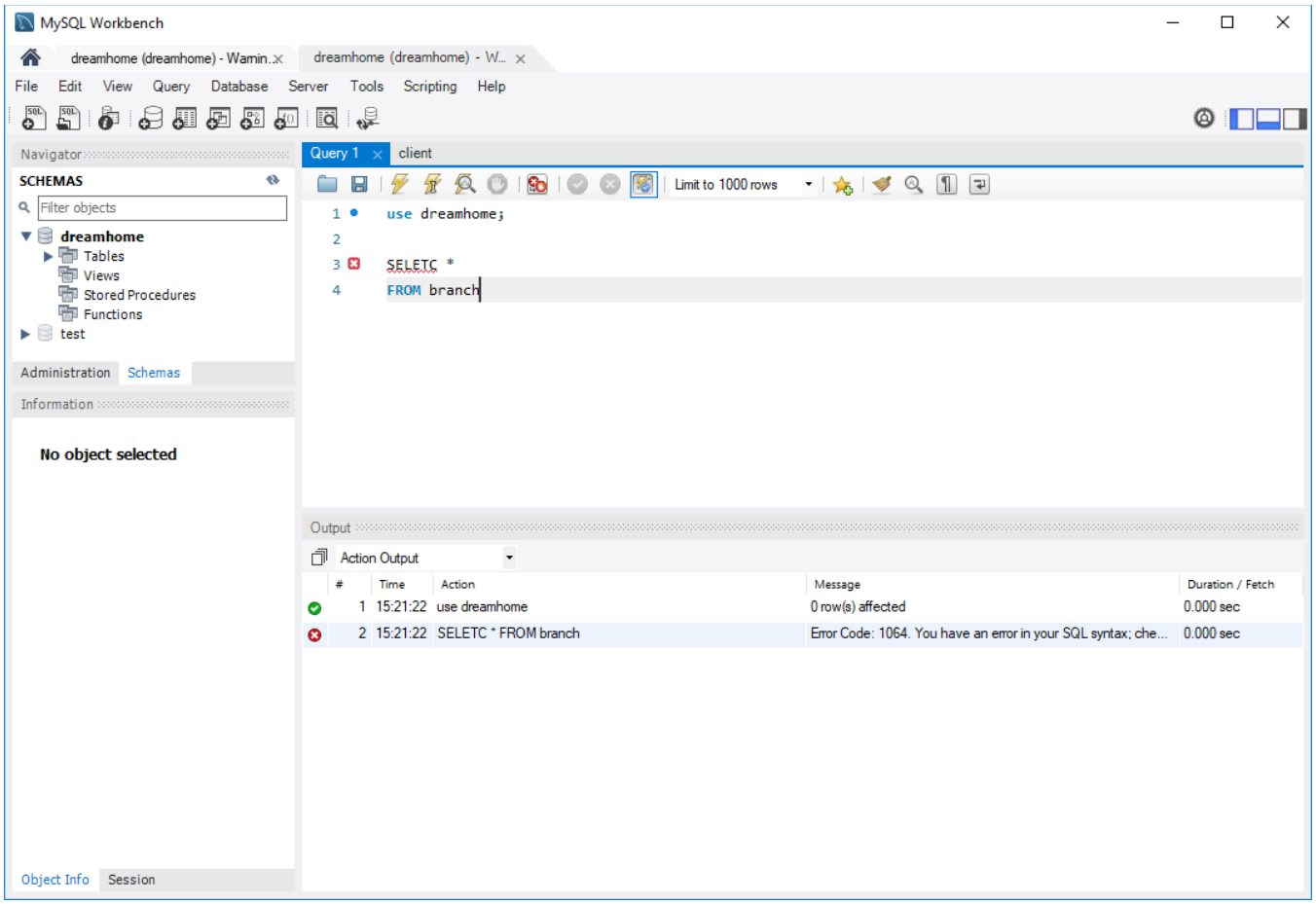
Note, if you do not see the Action Panel it may be because it was shrunk to where it is not visible. You can tell if this was the case by looking for the following at the bottom of the Workbench window (note the three lines of tiny x's).



If you slowly move the cursor near this boundary you'll see the cursor change shape to appear like a horizontal line with an up-down arrow near it center (I couldn't capture this image). If you now left-click and-hold and drag upwards you should reveal the contents of the Action Output panel, and can make it appear as seen at the top of this page

Syntax Errors

If you do have a syntax or spelling error (for example SELECT is misspelled in the query below) you will see this reflected in the Action Output panel, as seen below.



You now have seen the basics steps needed for entering and executing SQL queries. I encourage you to explore more by entering some of the queries given in Chapter 6 of your textbook.

Before exiting MySQL Workbench you should stop the server running so you do not have an unnecessary process running in the background.