MIS2502:
Data Analytics
MySQL and SQL Workbench

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MySQL

- MySQL is a database management system (DBMS)
- Implemented as a **server**

What is a server?

- Software specifically built to provide services to other applications

Examples

- File server
- Print server
- Web server
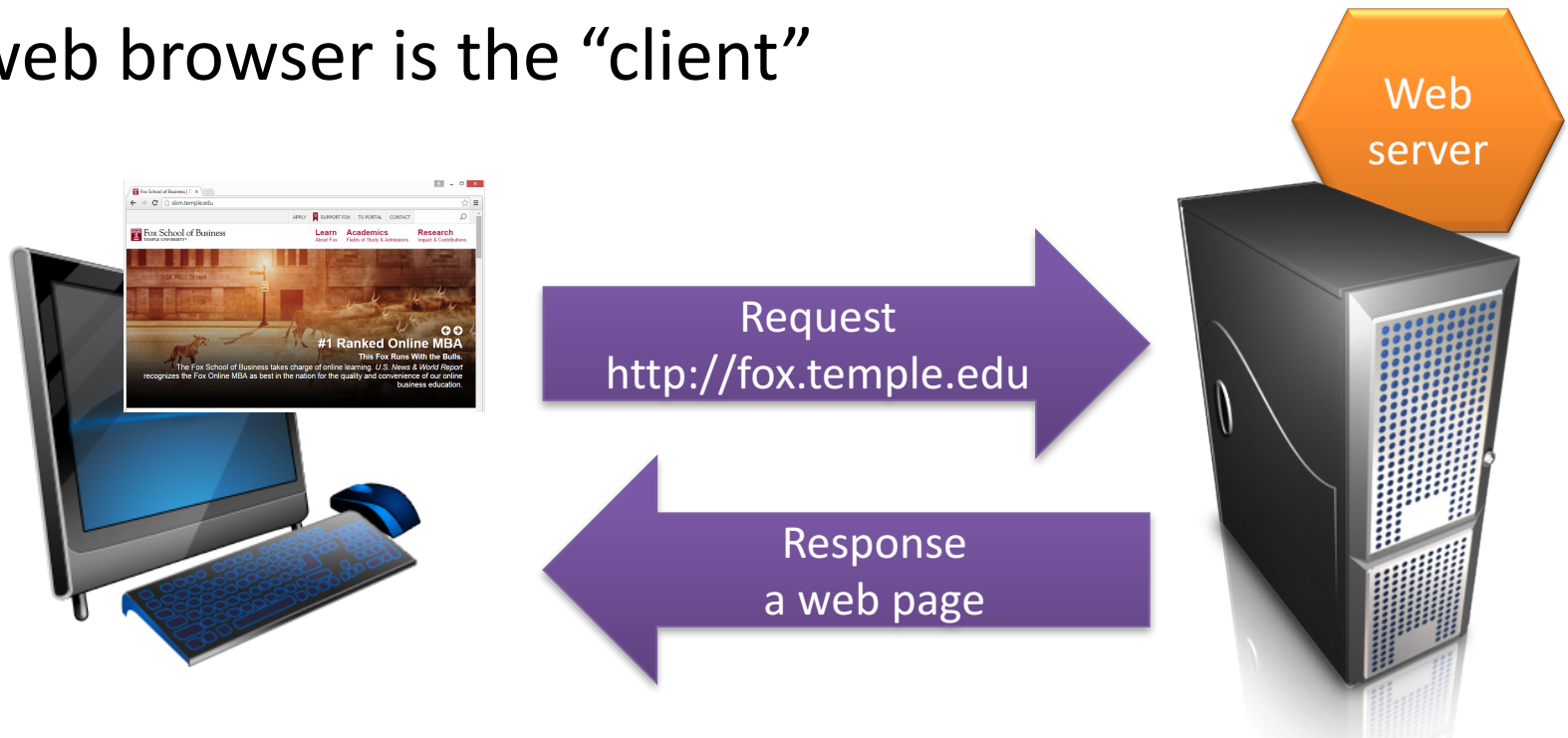- Database server

MySQL Database

Example: The web server

The web server "serves" web pages to the web browser

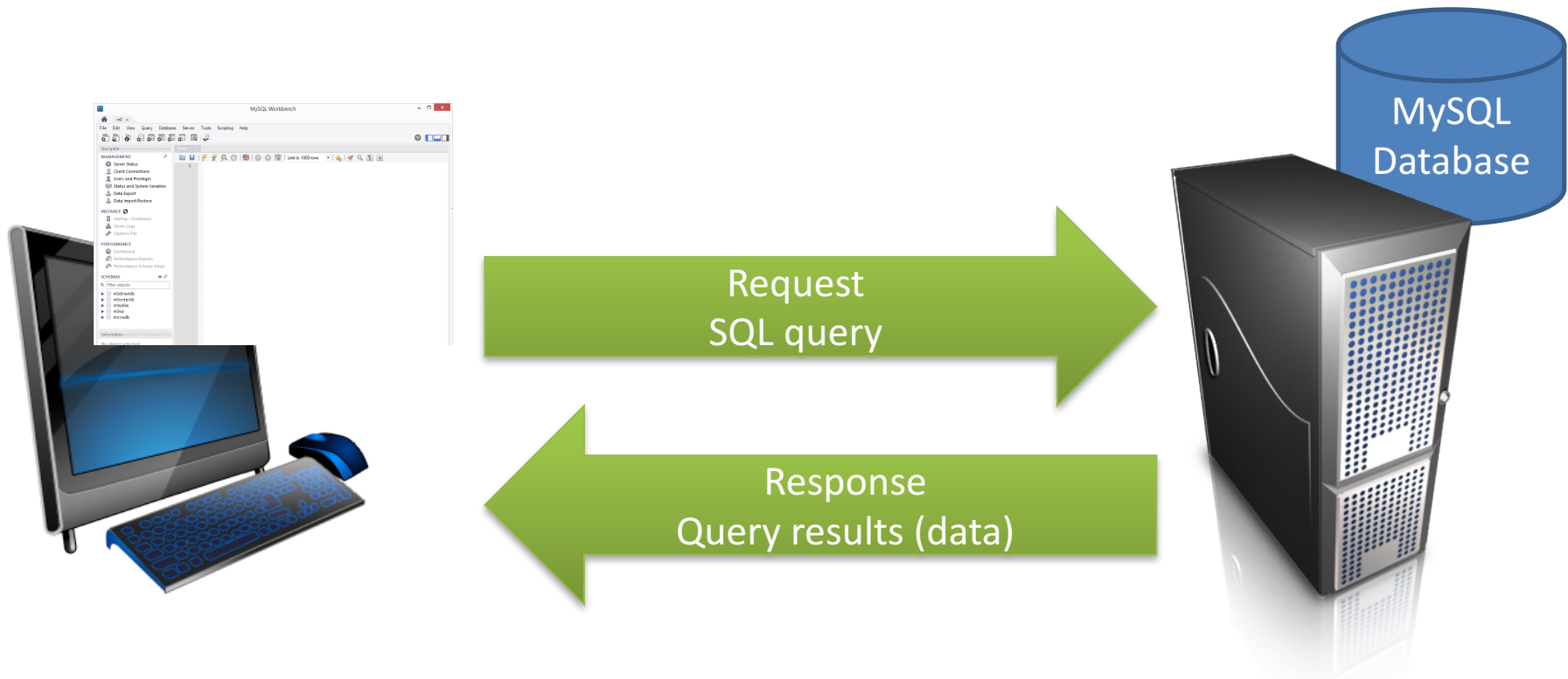The web browser allows the user to interact with the server

The web browser is the "client"

Request
http://fox.temple.edu

Response
a web page

Web server

Interacting with MySQL

The **client** can either be a business application or a utility

We're going to use the **MySQL Workbench** utility

Request
SQL query

Response
Query results (data)

MySQL
Database

MySQL Workbench

Enables the user to interact directly with the database

- Create and make changes to tables
- Extract information from tables
- Provide help creating SQL statements
- Create ERDs

We'll use SQL workbench to

- Create and execute SQL commands
- View query results

But we won't use it for modeling

- We want to do some things ourselves!

Limits of MySQL Workbench

It isn't meant for business users

For that, we'd construct an application

Why do we create applications for users, instead of allowing direct database interaction?

Placing an order at Amazon
- You don't interact with Amazon's database directly
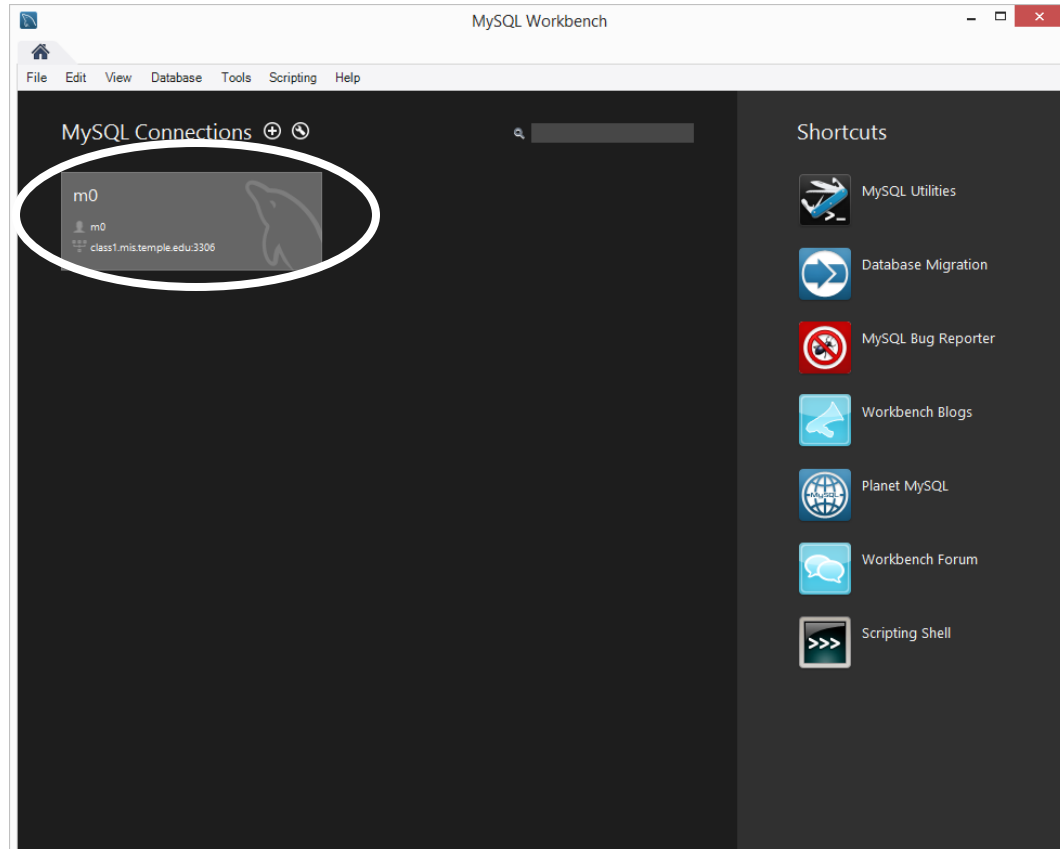- You do it through Amazon.com

Registering for a course
- You don't interact with Temple's database directly
- You do it through Owlnet
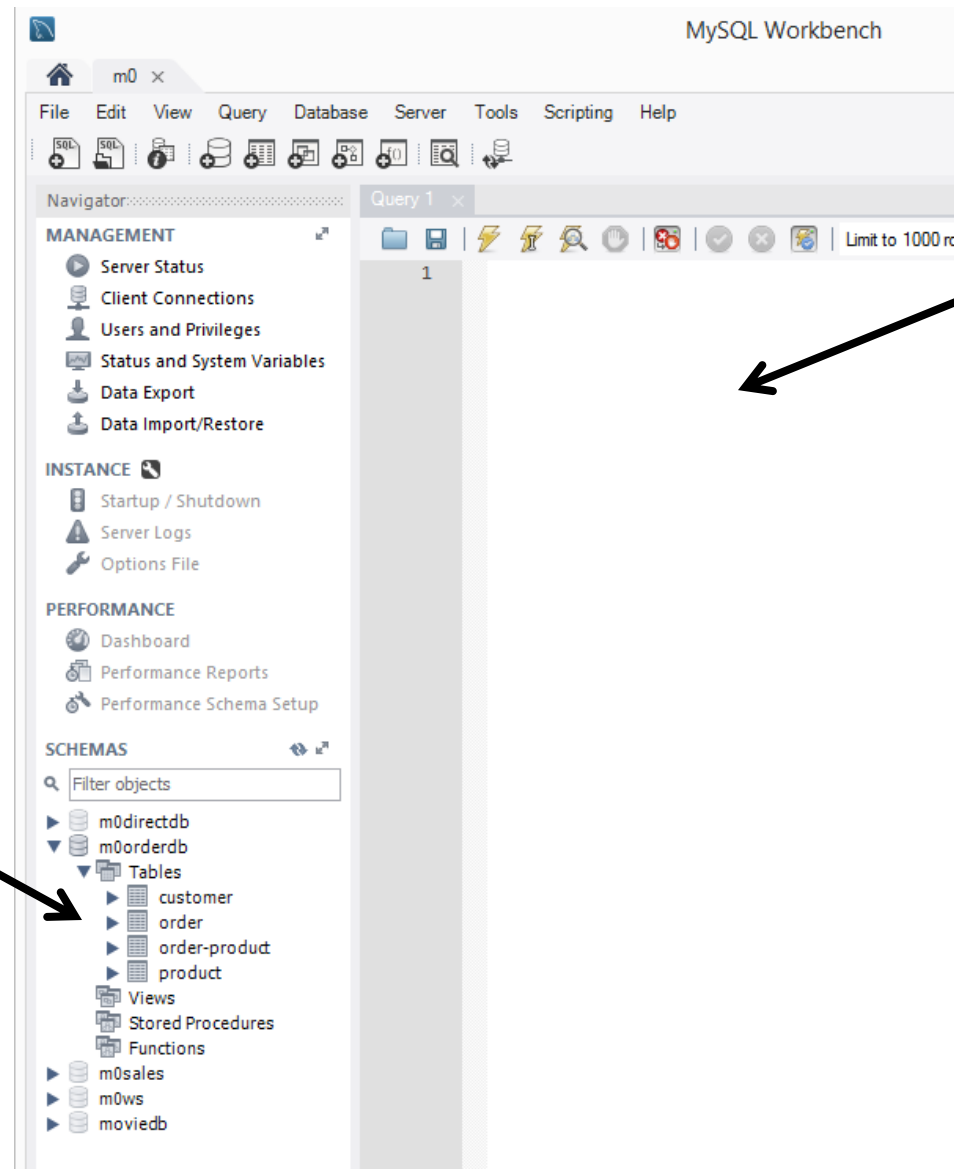
Connecting to a MySQL server

This is the opening screen

You click on a connection to connect to a server

You'll have access to your schemas on that server

We'll give you instructions explaining how to set up your connection to the class server, based on your username and password.
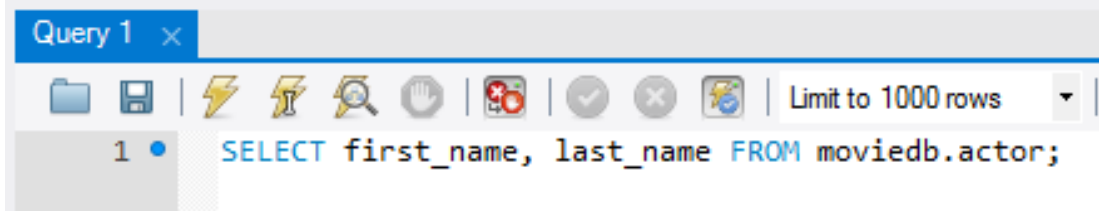
The MySQL Workbench interface

SQL Query panel

Overview tabsheet (the database schemas)

How many tables are in the m0orderdb schema?

Composing a SQL statement

- Let's just type this into the query panel

Don't worry about the syntax itself yet. We'll get to that soon…

- Notice how the words SELECT and FROM are highlighted in blue.
  - Those are the keywords (part of the SQL language)
  - The black indicates it isn't part of SQL
    - So they are part of the database itself, like schemas, tables, and fields
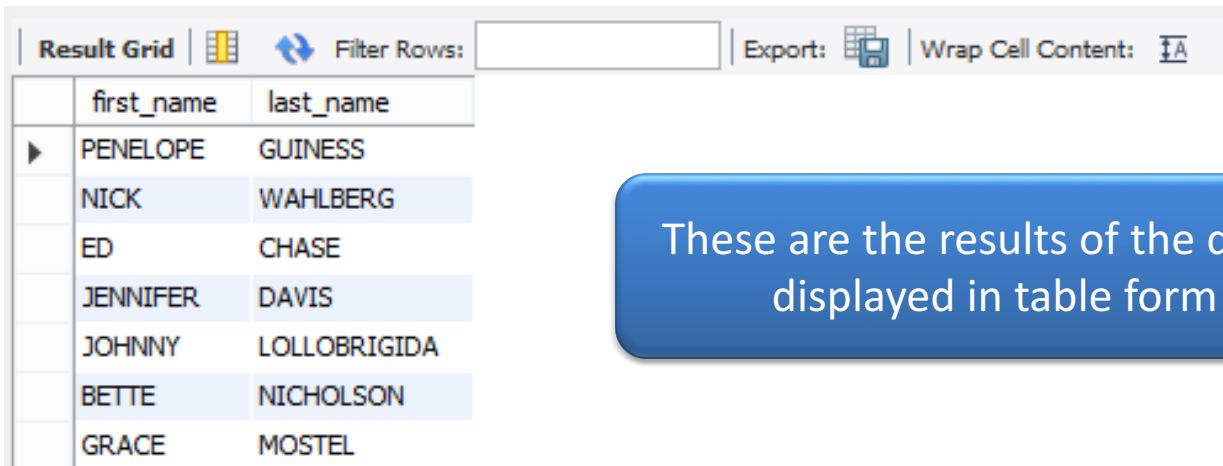
To execute the query

Click on the lightening bolt icon…
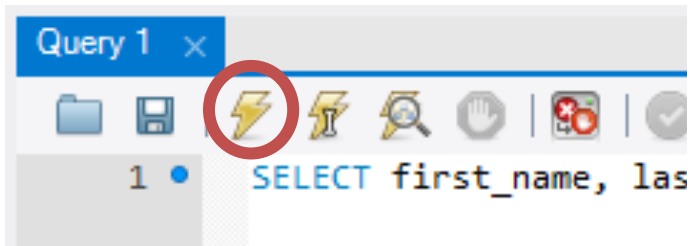
…or select "Execute Current Statement" from the Query menu
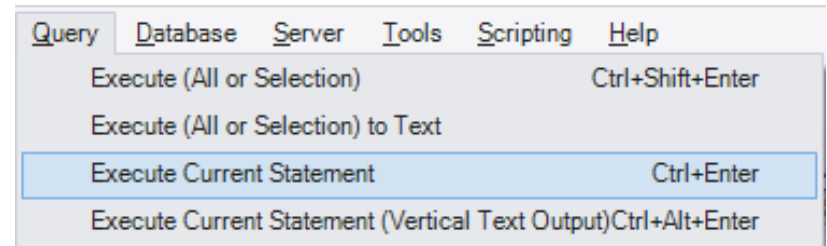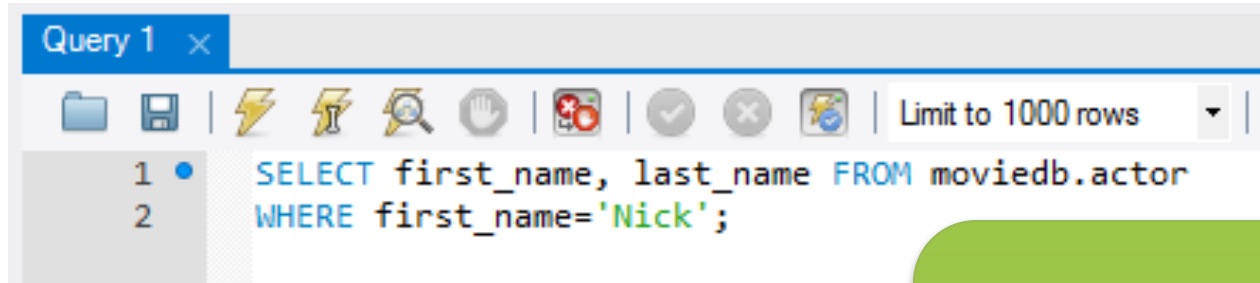

…and you'll wind up with this result

These are the results of the query, displayed in table form
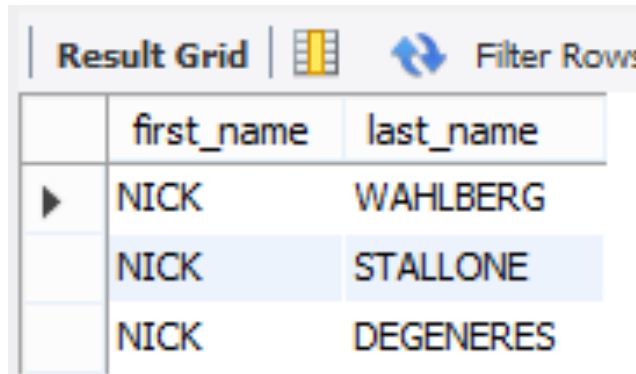
Another example

- This query
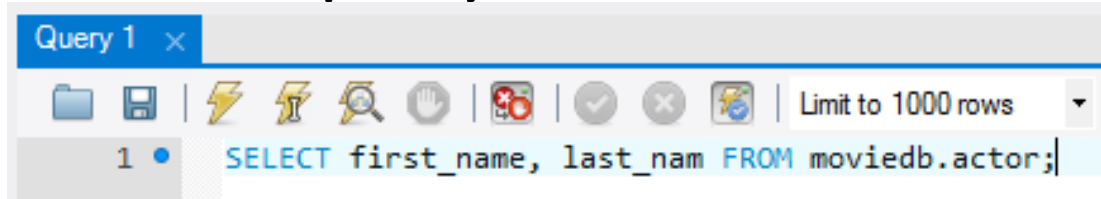
- gives us this

The green highlighting indicates this is a string literal, or a set of letters a numbers.

In other words, what's between the quotes isn't a SQL command OR an element in the database
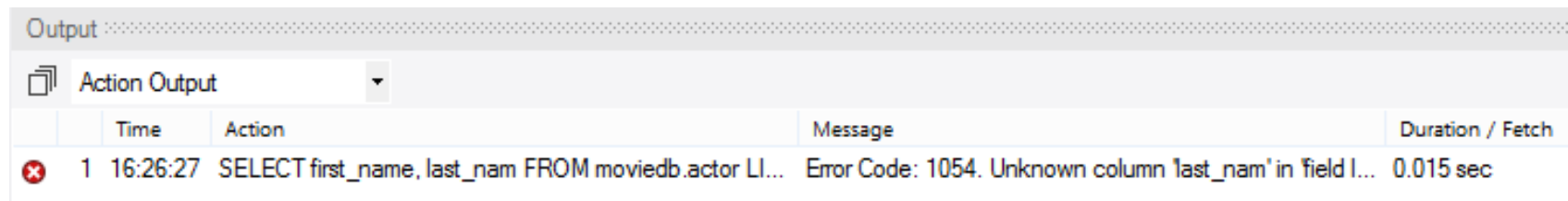
The editor will catch mistakes

- This is a query with no answer

  because "last_nam" isn't a field in the table

- Instead of query results, we now get this
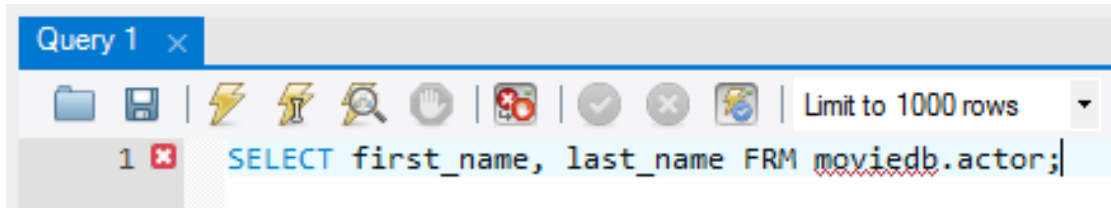
indicating the source of the error

If the syntax is wrong…
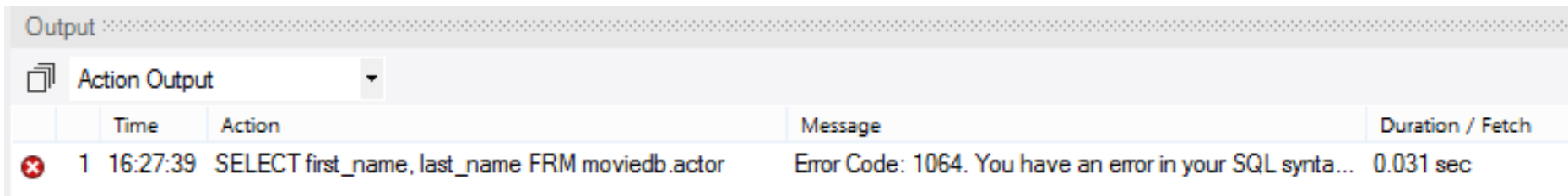
- We've spelled "FROM" wrong

FRM isn't green because it is not recognized as a SQL keyword!

- And now we get this error

- MySQL Workbench can't tell quite what's wrong, but it knows it isn't a correctly formatted SQL command
- It thinks "moviedb" is the source of the problem, but really it's a misspelled keyword

Automatically generated SQL

MySQL Workbench can generate the more complex queries for you

Right-click on the customer table in mxorderdb and Select Rows...
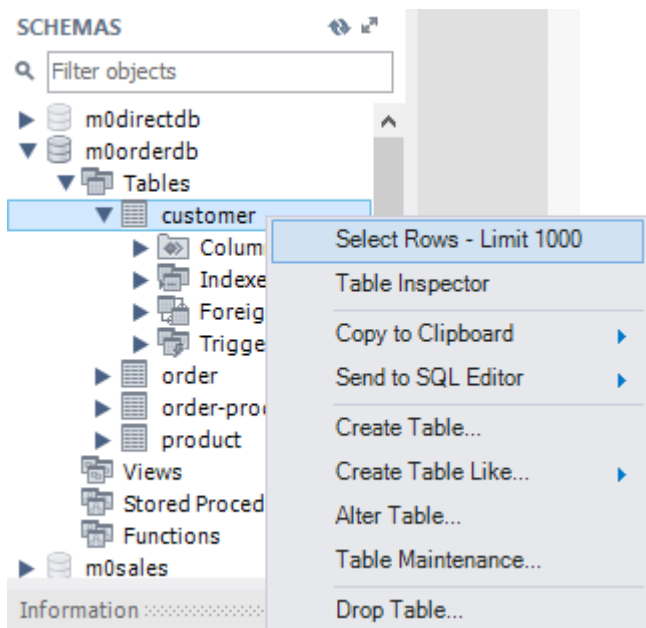
...and you'll see an editable table that you can work with.

Instead of m0orderdb, you'll have your own number (i.e., m33orderdb). That's ok.
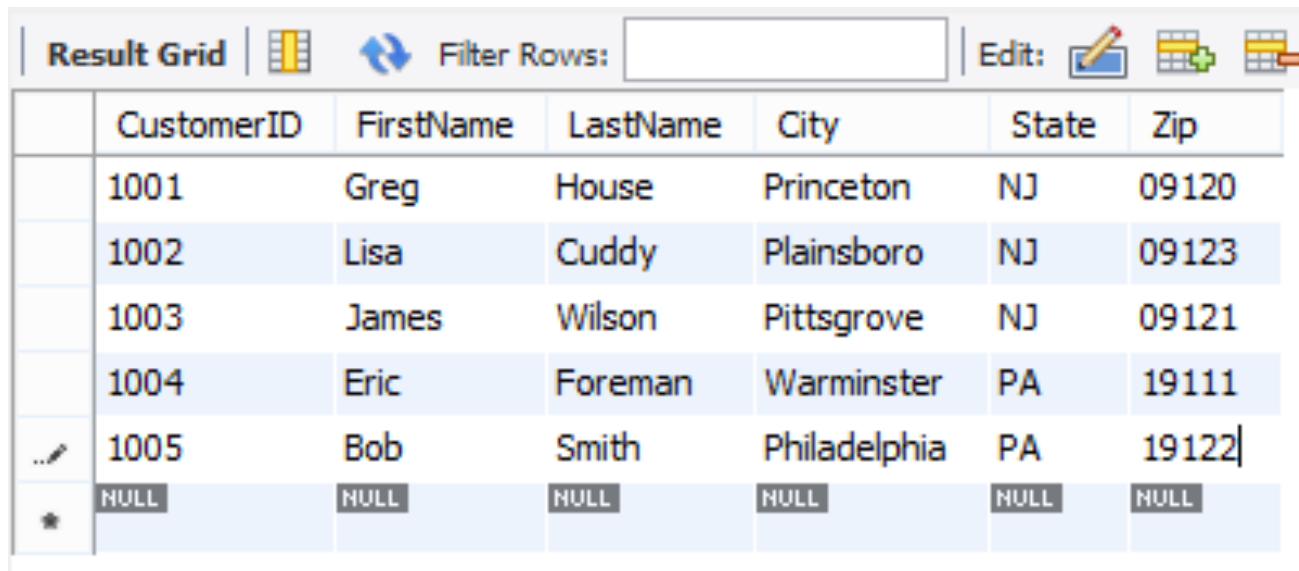
Example: Adding a row

Now we'll add another row to the table, just like we're filling in a spreadsheet

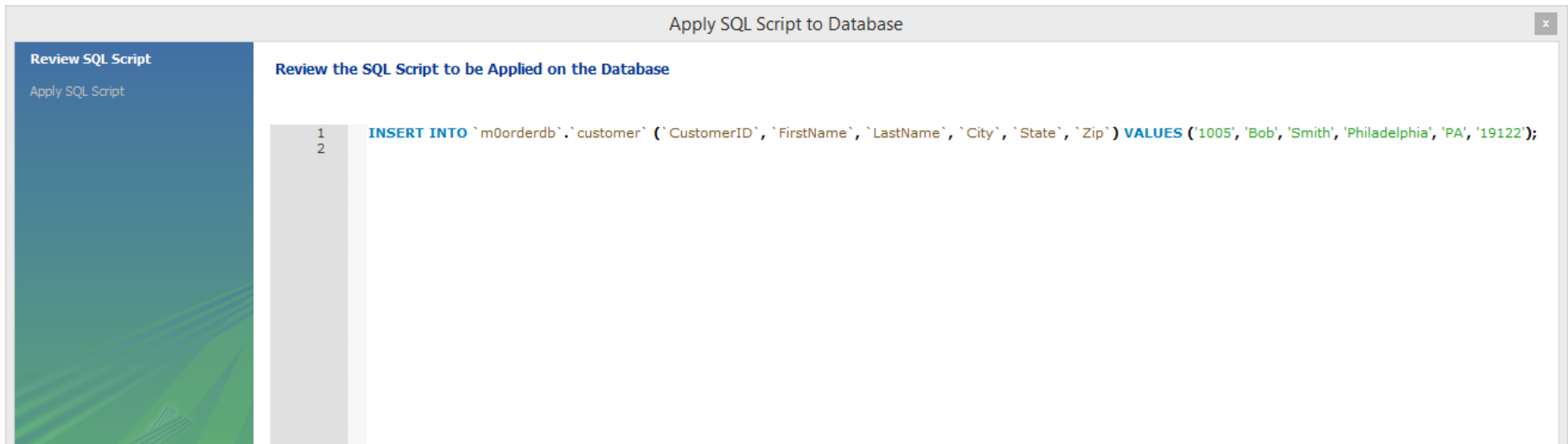|	CustomerID	FirstName	LastName	City	State	Zip
	1001	Greg	House	Princeton	NJ	09120
	1002	Lisa	Cuddy	Plainsboro	NJ	09123
	1003	James	Wilson	Pittsgrove	NJ	09121
	1004	Eric	Foreman	Warminster	PA	19111
	1005	Bob	Smith	Philadelphia	PA	19122
*	NULL	NULL	NULL	NULL	NULL	NULL

Result Grid | Filter Rows: | Edit:

Click on the "Apply" button in the bottom right corner of the window

Apply   Revert

The generated SQL statement

This is the SQL statement that will add the row to the database

You can make changes to the SQL, or just click "Apply"
- That will send the SQL statement to the MySQL database server for processing

Adding a table

- In the Object Browser, right-click on Tables under m*x*orderdb

- Then select "Create Table" from the menu
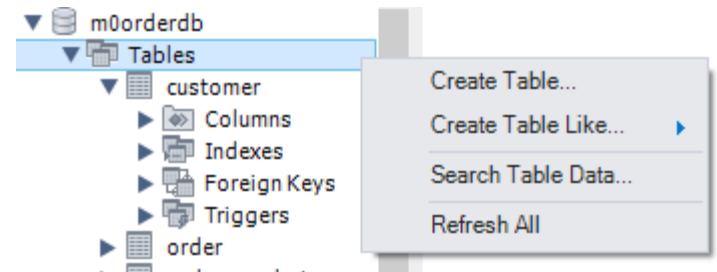
- Give the table a name, then enter column names and data types

- Then click the "Apply" button

We'll learn what the data types mean a little later...

And the result is this…

Apply SQL Script to Database

Review SQL Script
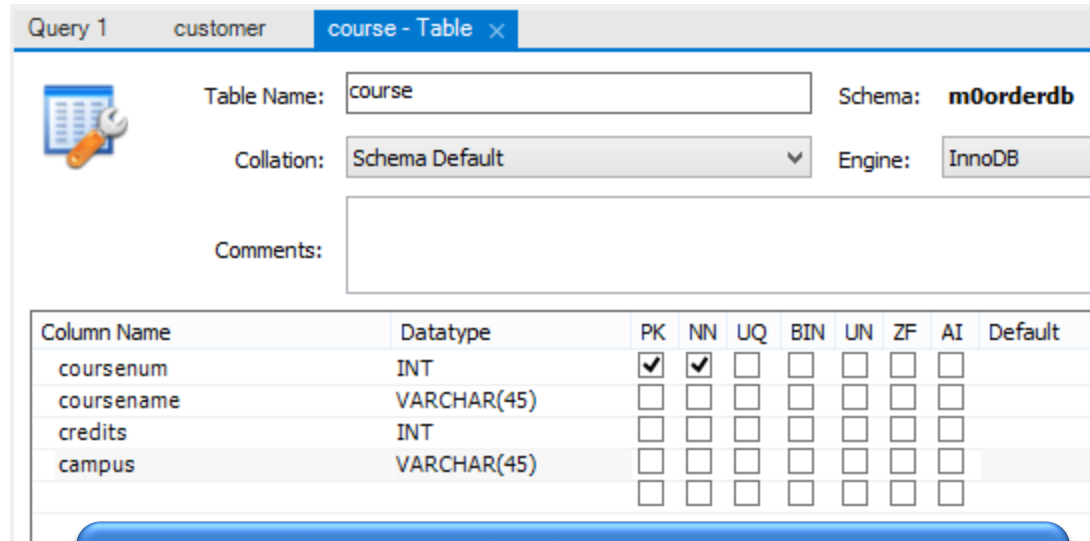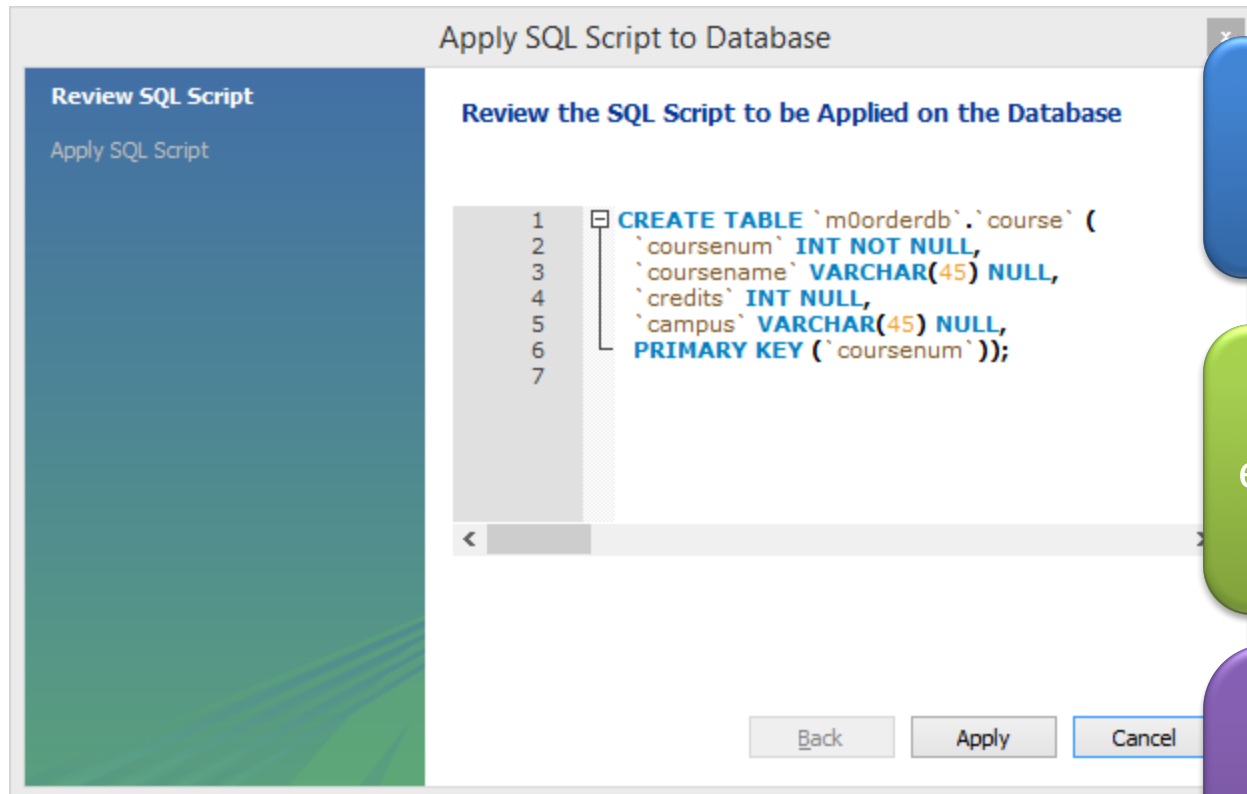
Apply SQL Script

Review the SQL Script to be Applied on the Database

```
1  CREATE TABLE `m0orderdb`.`course` (
2    `coursenum` INT NOT NULL,
3    `coursename` VARCHAR(45) NULL,
4    `credits` INT NULL,
5    `campus` VARCHAR(45) NULL,
6  PRIMARY KEY (`coursenum`));
7
```

Back   Apply   Cancel

We'll learn the syntax for all of these statements.

But every query can be entered directly through the query panel.

You'll need to know how to create the SQL yourself, even if you use MySQL Workbench for help.

It will also generate statements for…

- Deleting a row from the table (SQL DELETE)
  - Right-click on a field in the row and select "Delete Row(s)"

- Changing a row in a table (SQL UPDATE)

- Delete an entire table (SQL DROP)
  - Right-click on the table name and select "Drop Table…"
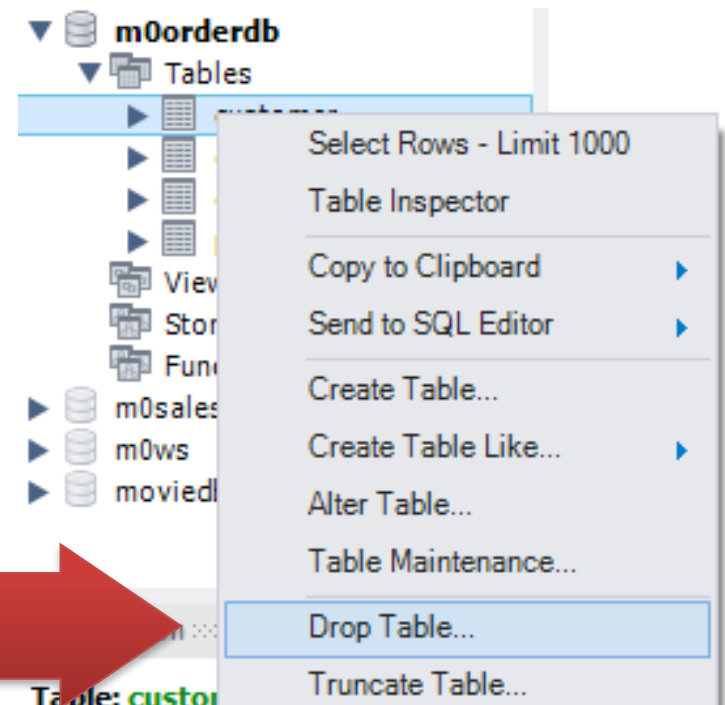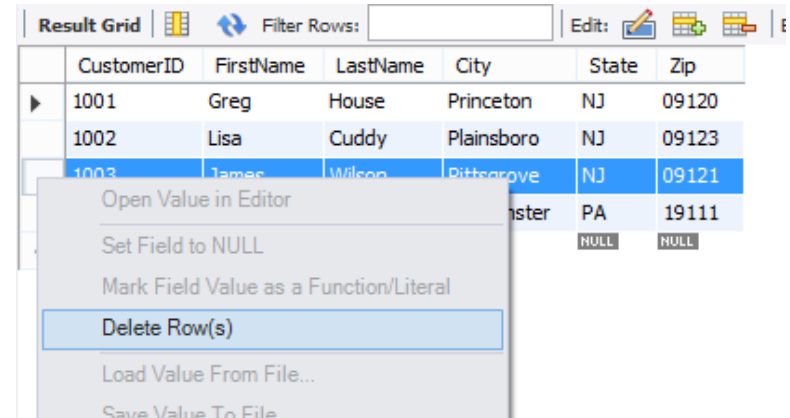
By the way…DON'T DO THIS!!

The bottom line

SQL Workbench makes it easy to interact with a MySQL database

It can help you compose queries through highlighting, syntax checking, and the automated query functions

In reality, a database administrator would use a combination of automated query generation and manual entry

The more complex the query, the more likely it will have to be entered manually