COP 4710: Database Systems
Fall 2011

Introduction To MySQL

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http://www.cs.ucf.edu/courses/cop4710/fall2011

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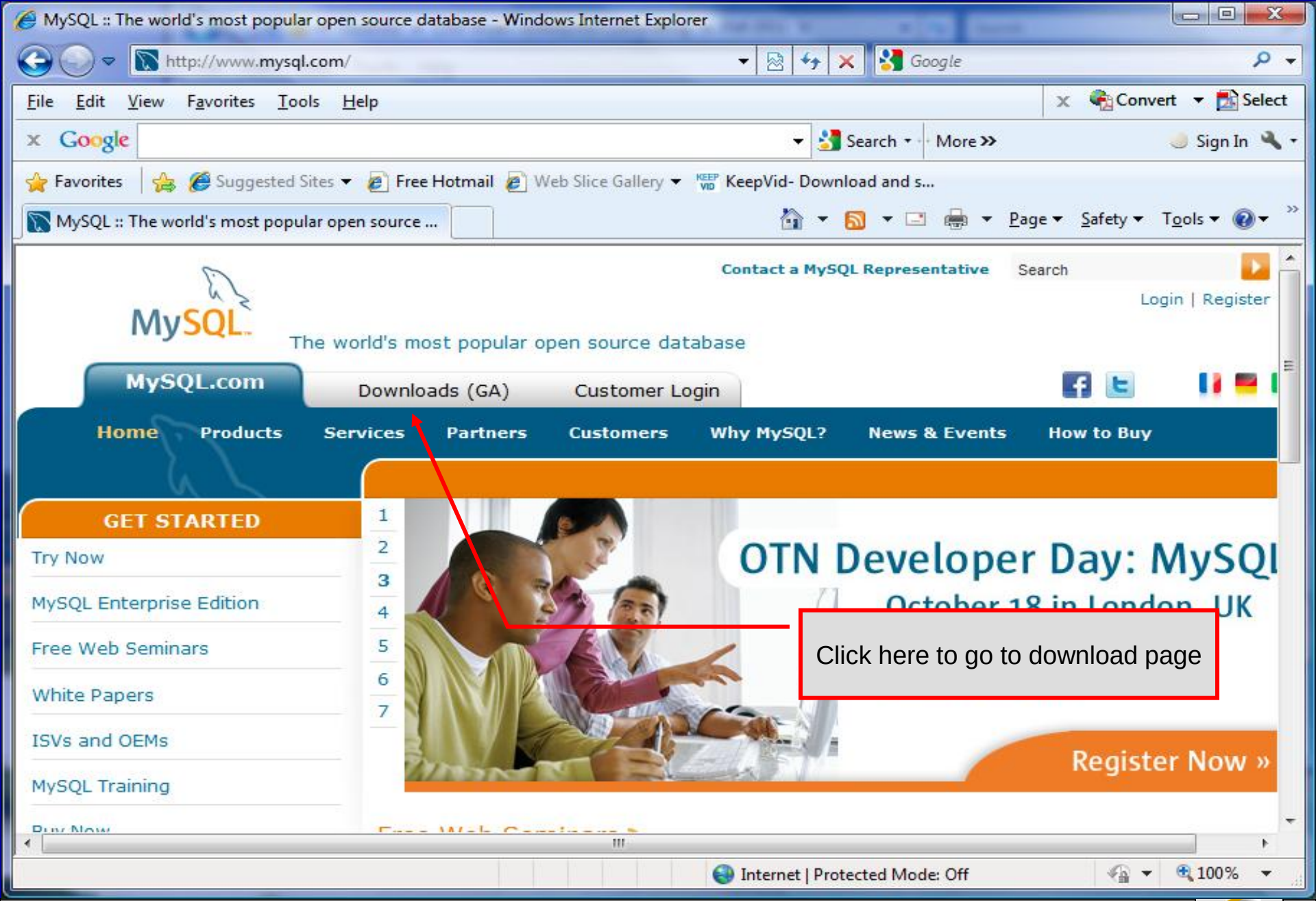
Computer Science Division
University of Central Florida

MySQL RDBMS

- MySQL is a database server (although it does come with a set of simple client programs). The current stable version is 5.5.16 and can be downloaded from www.mysql.com. I'm illustrating version 5.5.15 which I downloaded last week. (Any of the versions of MySQL 5.1.32 or greater will be fine for our purposes.)

- It is typically used in thin client environments. In other words, it is used in client-server systems where the bulk of the processing and storage takes place on the server, and the client is little more than a dumb terminal.

- MySQL performs multithreaded processing, which means that multiple clients are allowed to connect to it and run transactions simultaneously. This makes MySQL extremely fast and well suited to client-server environments such as Web sites and other environments that process numerous transactions for multiple users.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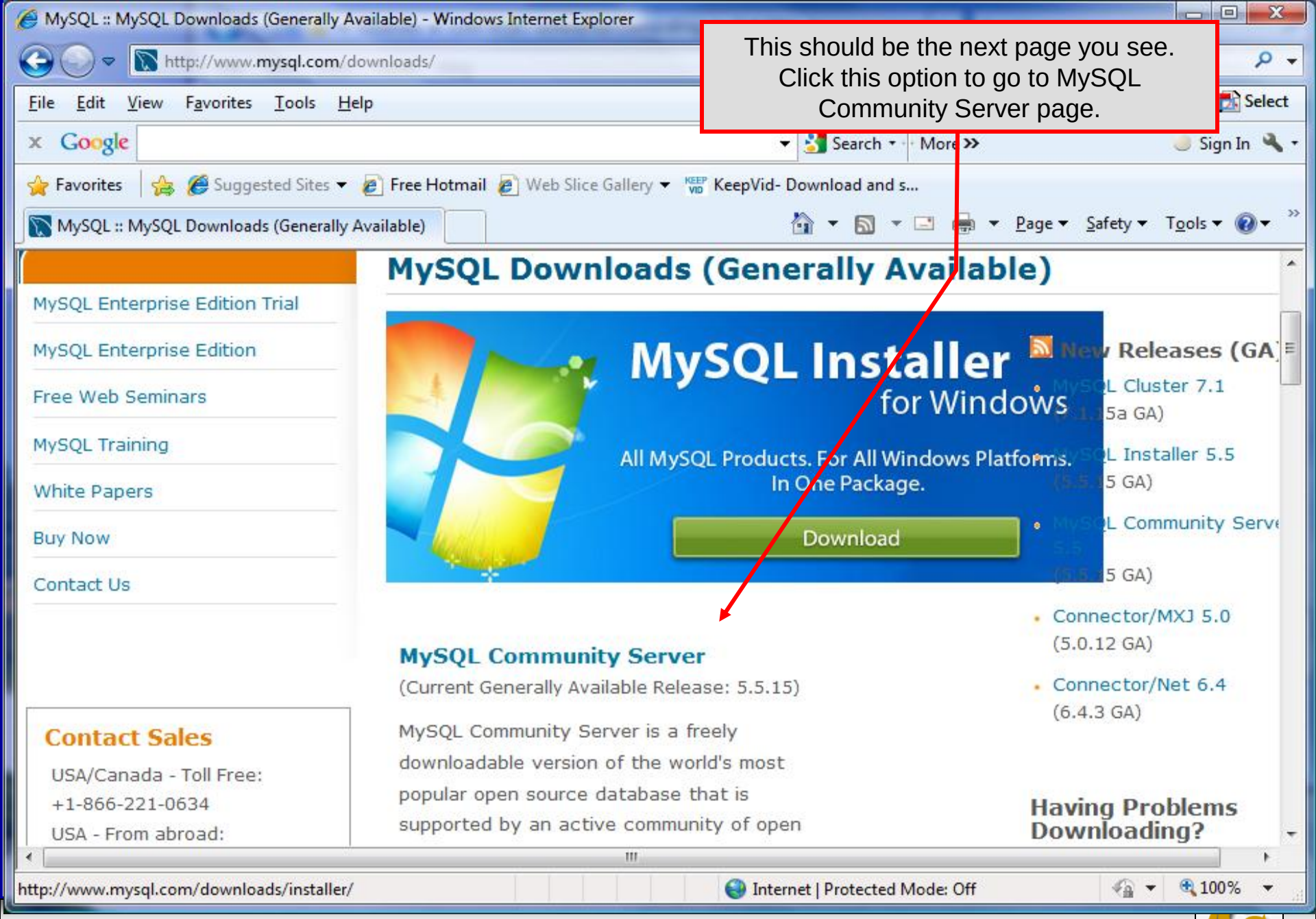
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(6.4.3 GA)
MySQL Community Server
(Current Generally Available Release: 5.5.15)
MySQL Community Server is a freely downloadable version of the world's most popular open source database that is supported by an active community of open
Having Problems Downloading?
Contact Sales
USA/Canada - Toll Free:
+1-866-221-0634
USA - From abroad:
http://www.mysql.com/downloads/installer/
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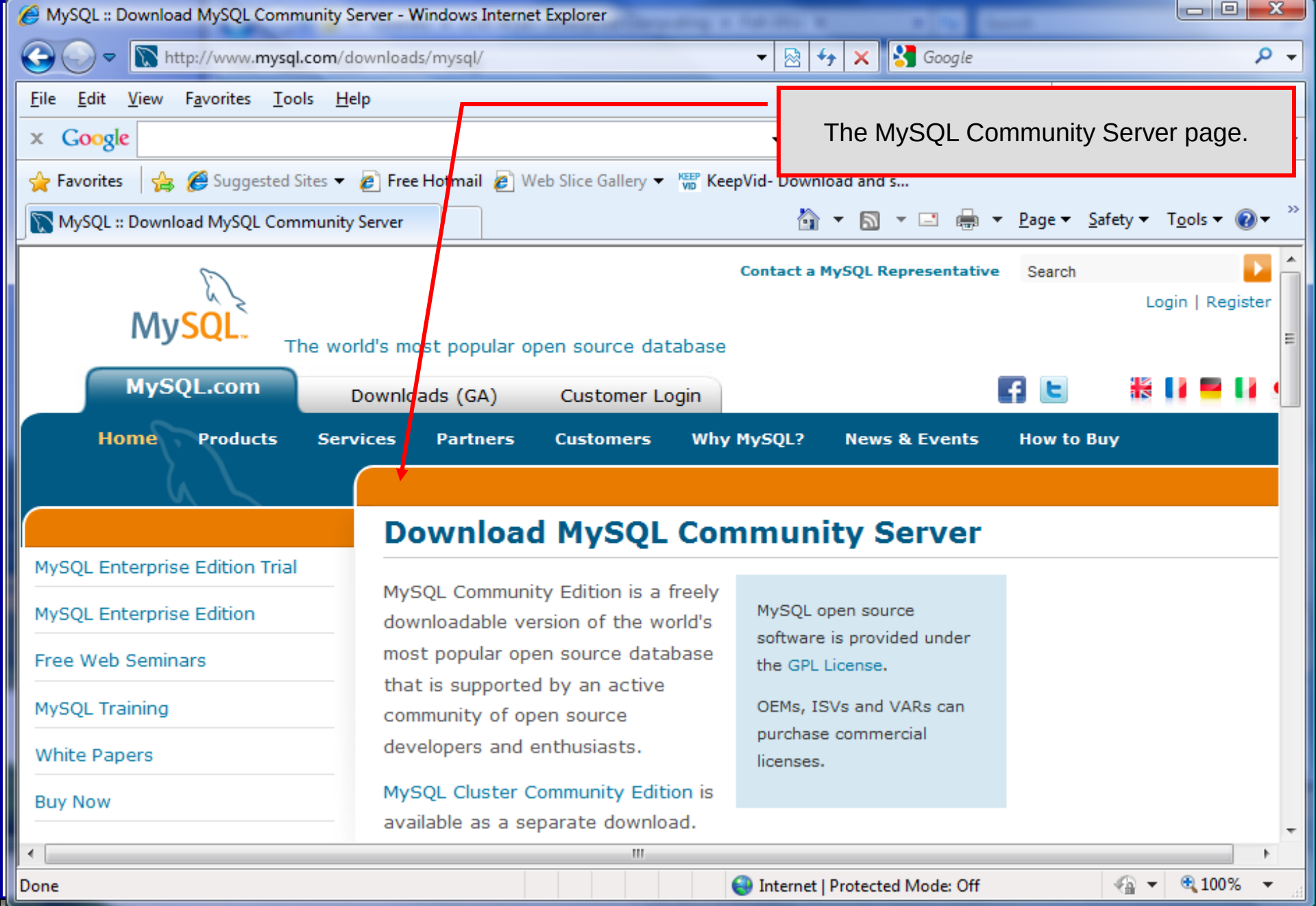
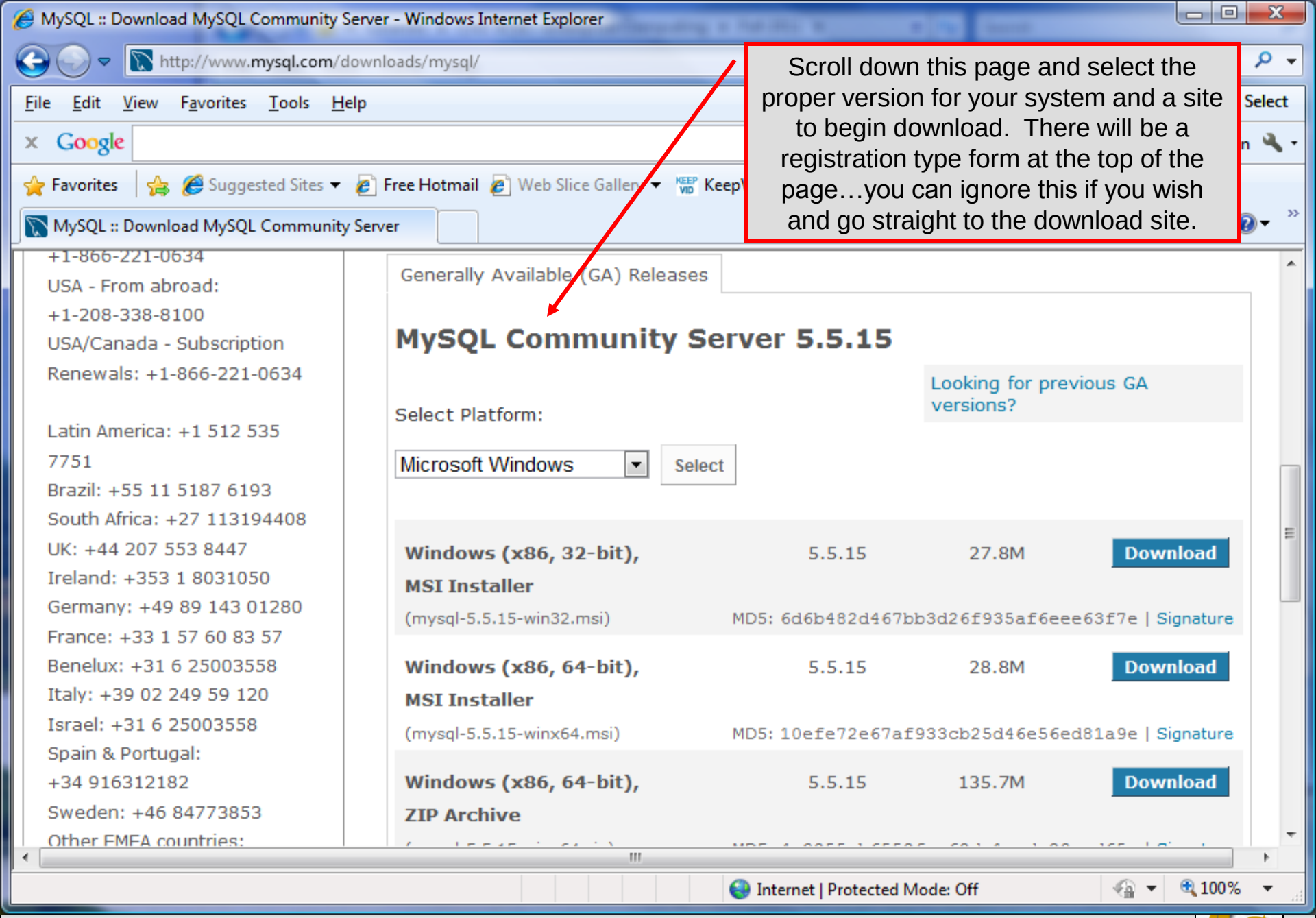
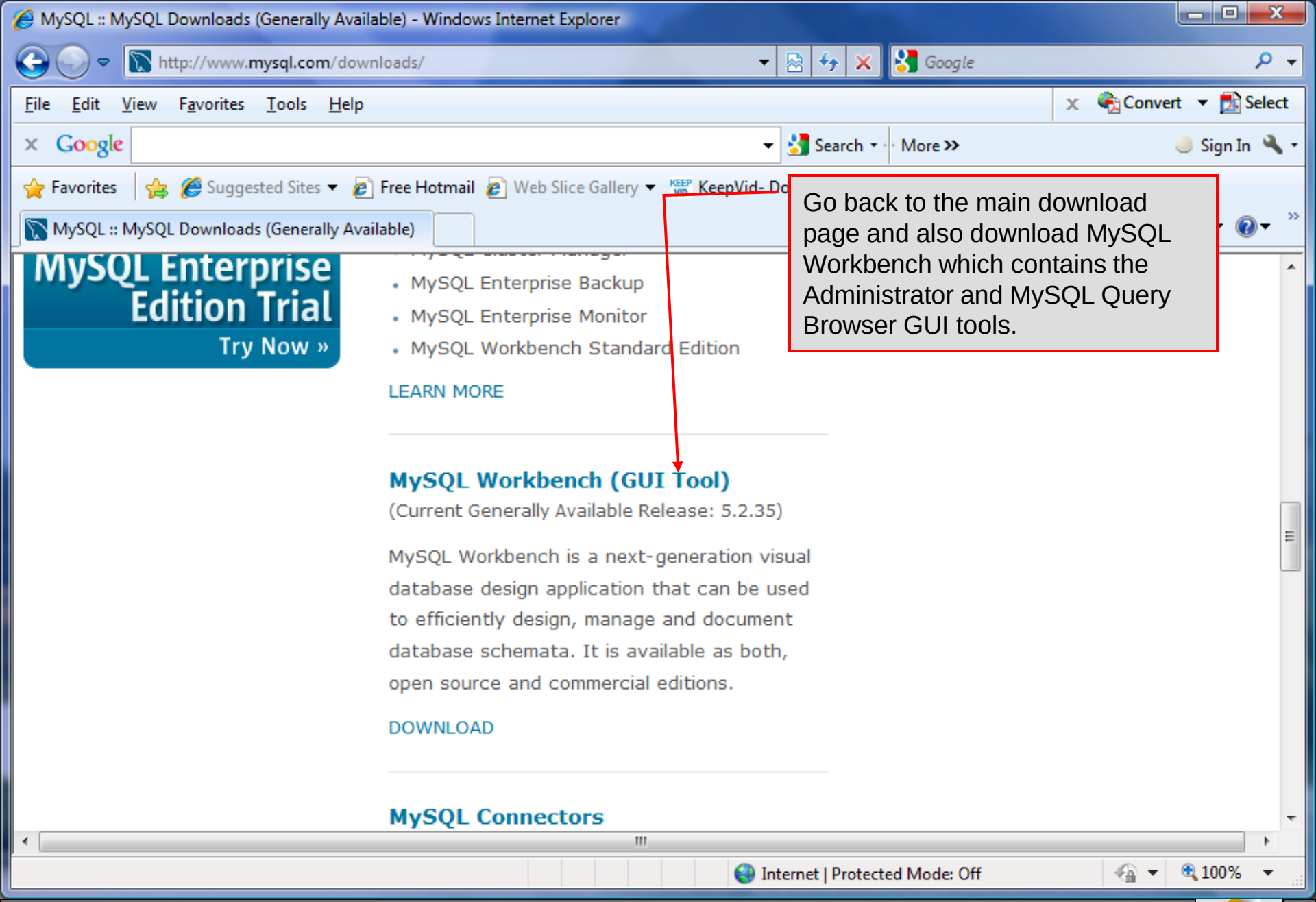


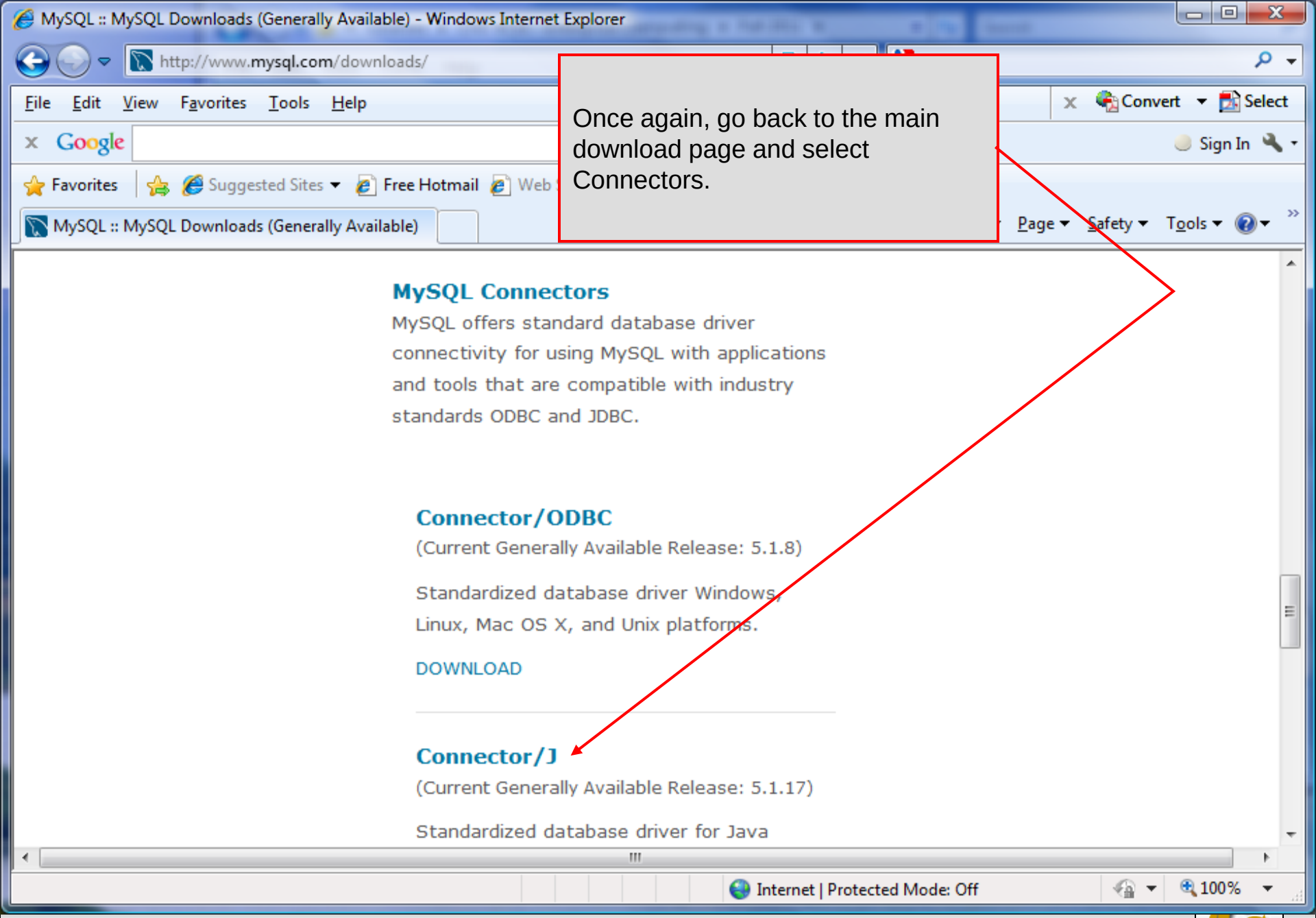
The MySQL Community Server page.



Scroll down this page and select the proper version for your system and a site to begin download. There will be a registration type form at the top of the page…you can ignore this if you wish and go straight to the download site.



Go back to the main download page and also download MySQL Workbench which contains the Administrator and MySQL Query Browser GUI tools.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MySQL Connectors
MySQL offers standard database driver connectivity for using MySQL with applications and tools that are compatible with industry standards ODBC and JDBC.
Connector/ODBC
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(Current Generally Available Release: 5.1.17)
Standardized database driver for Java
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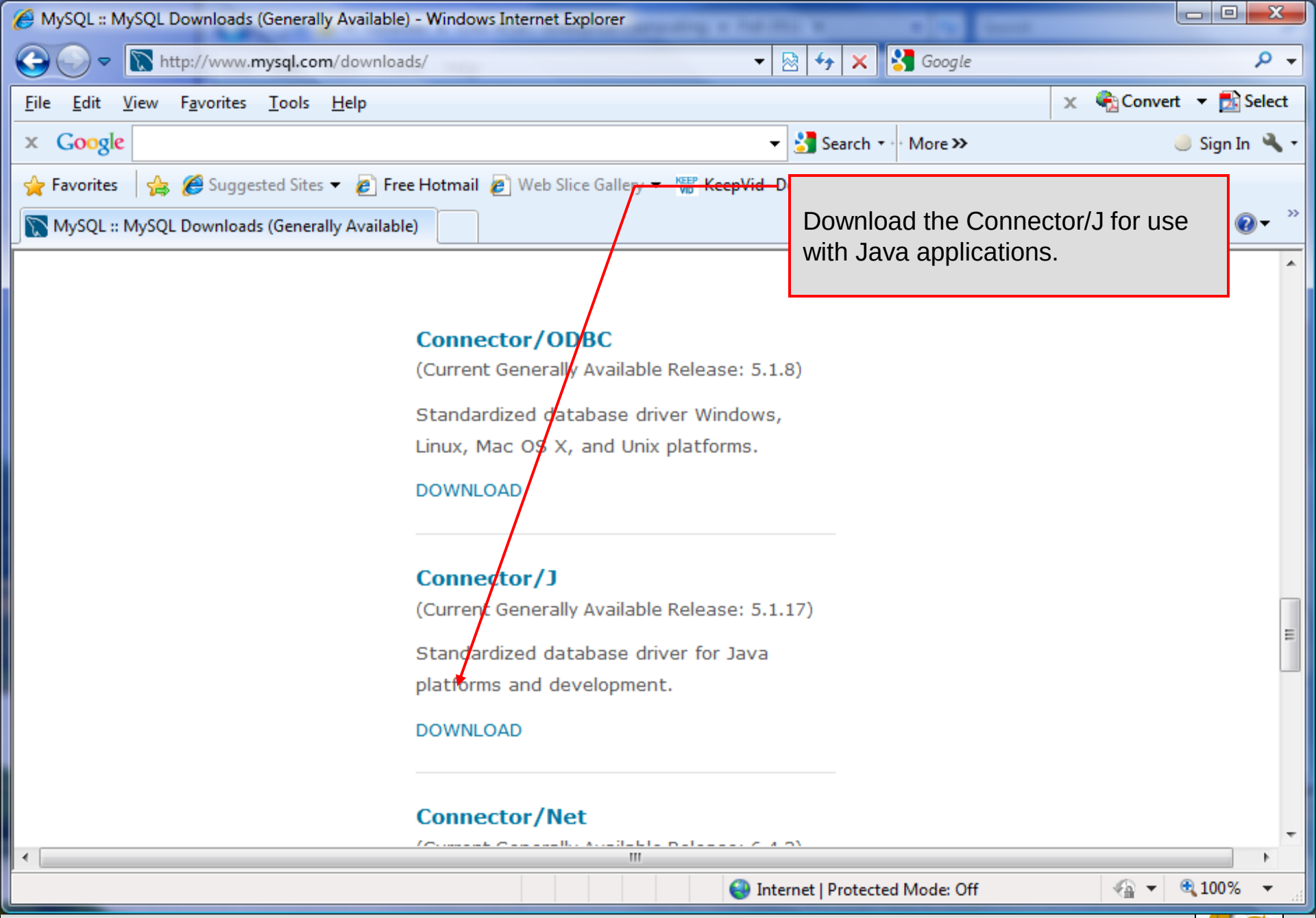
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Installing MySQL 5.5.15

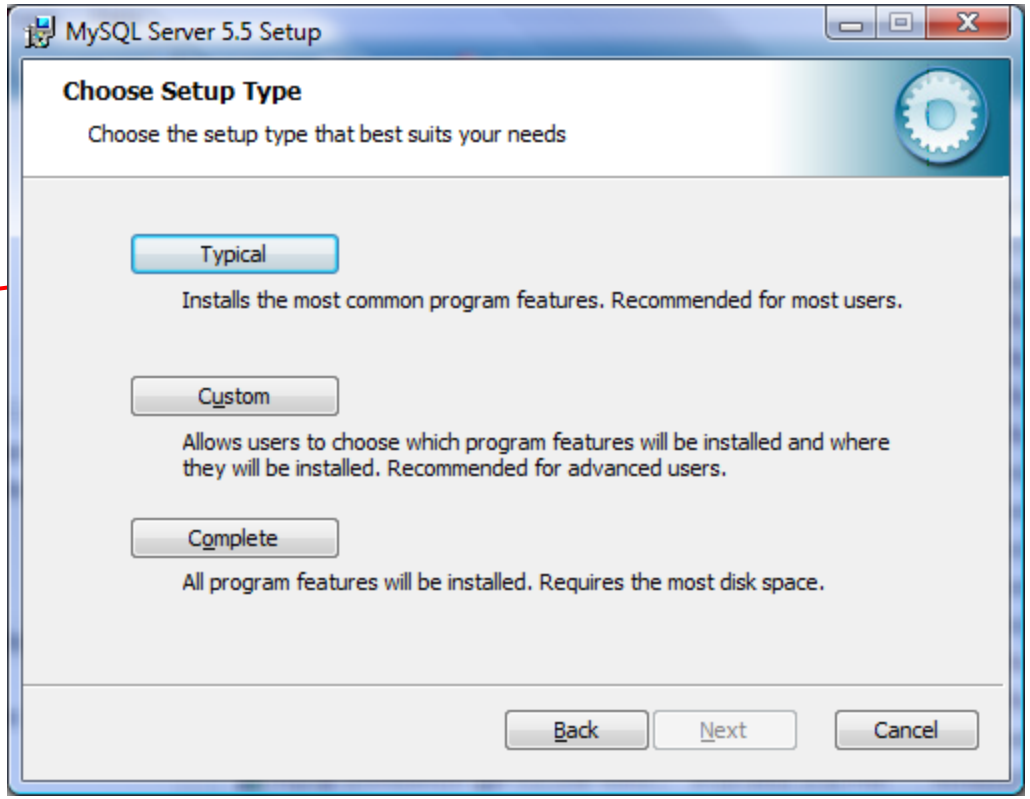
- Once you've got MySQL downloaded, go through the installation process. It may vary somewhat depending on platform.
- I've illustrated the basic install on Windows XP over the next few pages, just to give you an idea of what you should be seeing.

Installing MySQL 5.5.15

- Once you've got MySQL downloaded, go through the installation process. It may vary somewhat depending on platform.
- I've illustrated the basic install on Windows XP over the next few pages, just to give you an idea of what you should be seeing.
- Once the Window installer is running you should see the following window appear:
- Click Next and accept the terms on the next window.

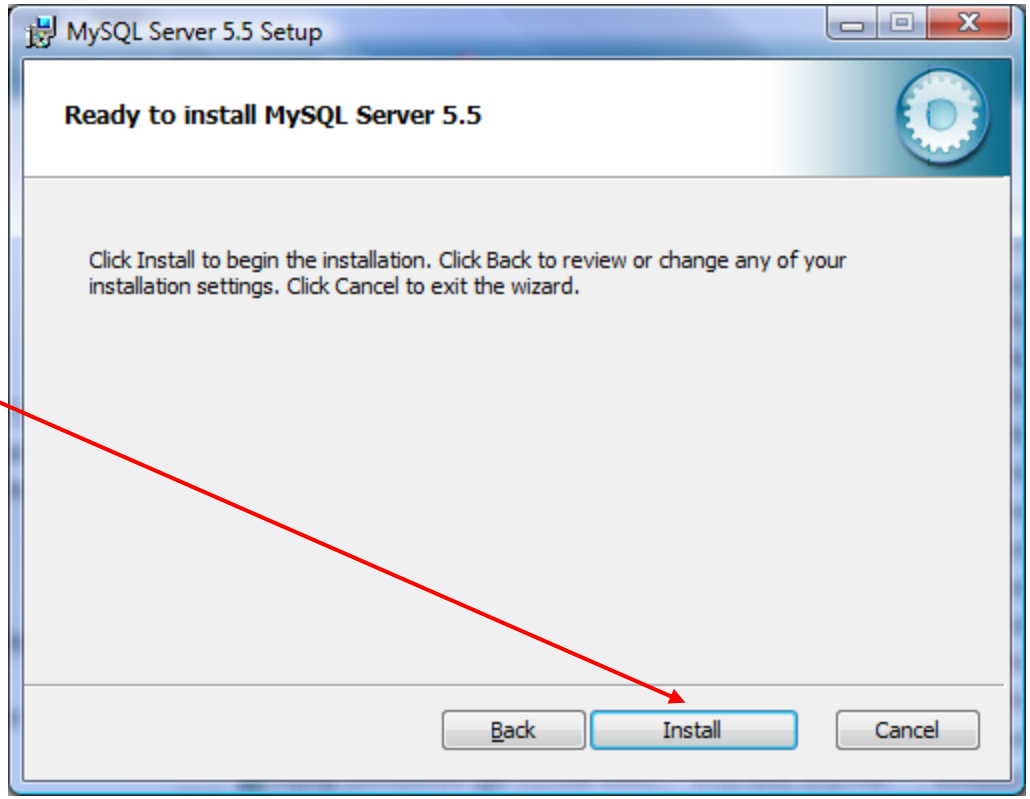
Installing MySQL 5.5.15 (cont.)

Your choice here. For this course, a typical set-up will be fine.

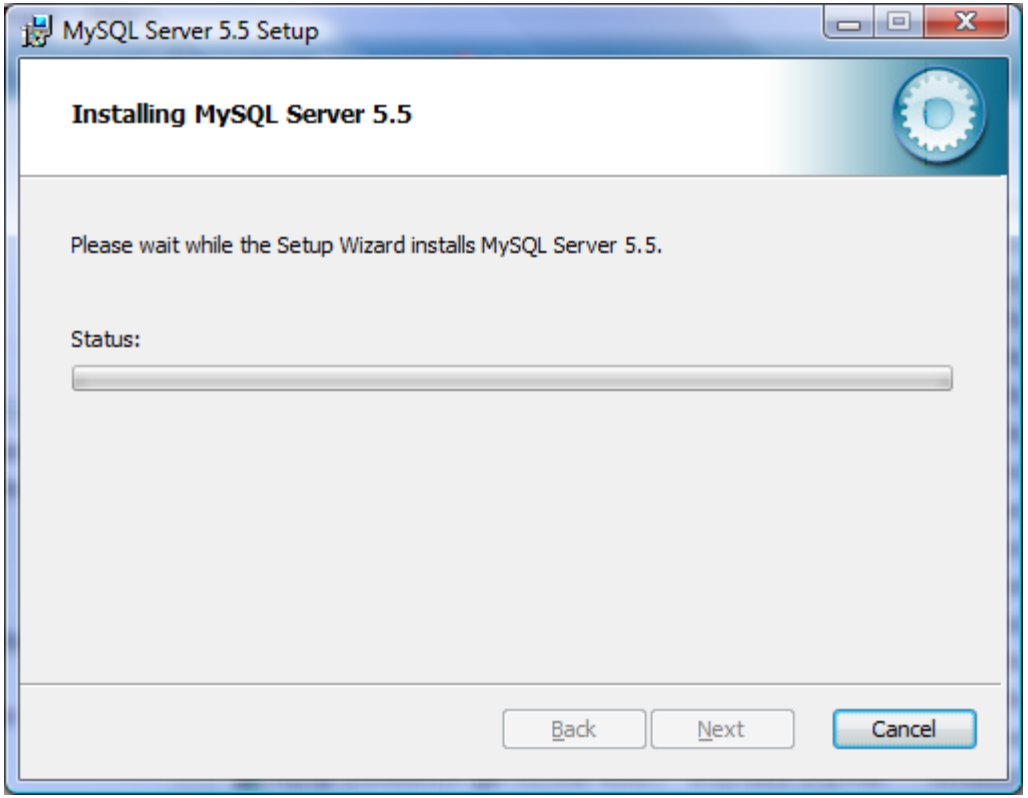


Installing MySQL 5.5.15 (cont.)

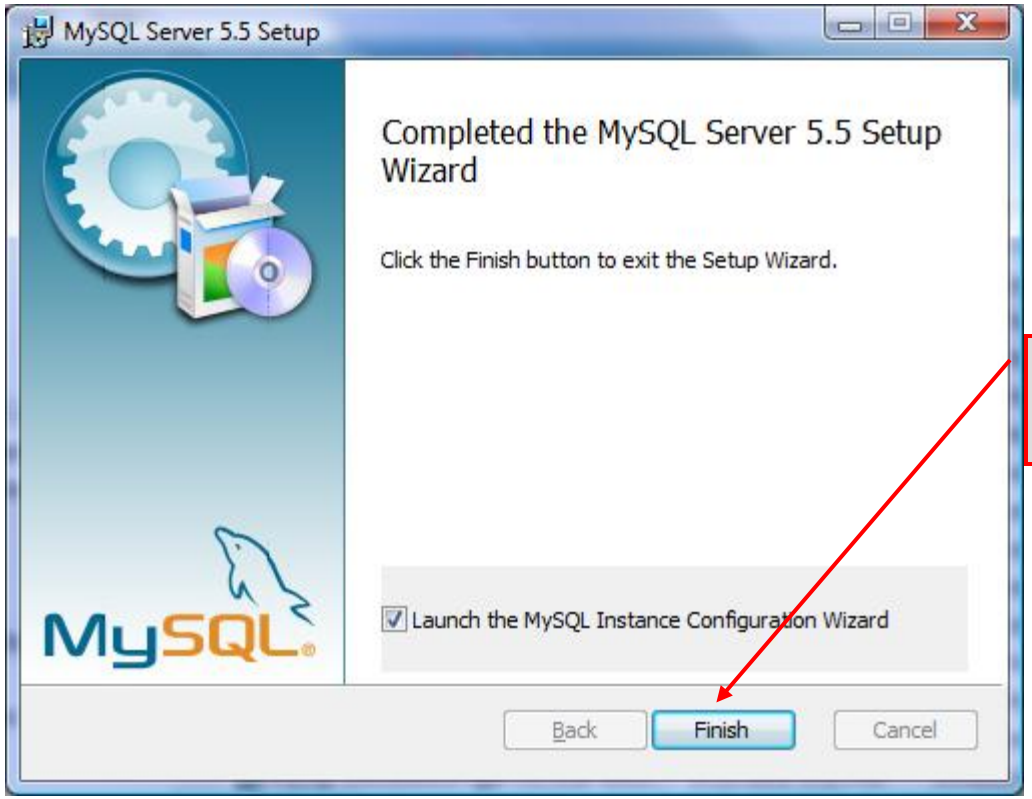
Click Install



Installing MySQL 5.5.15 (cont.)



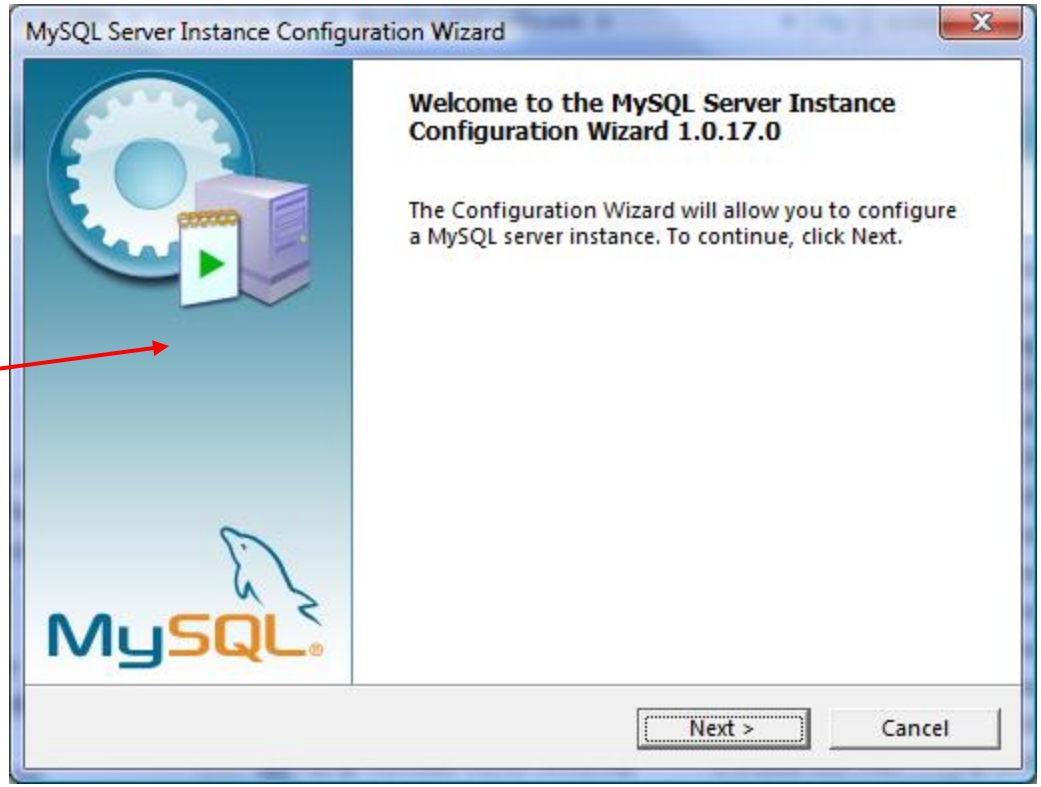
Installing MySQL 5.5.15 (cont.)



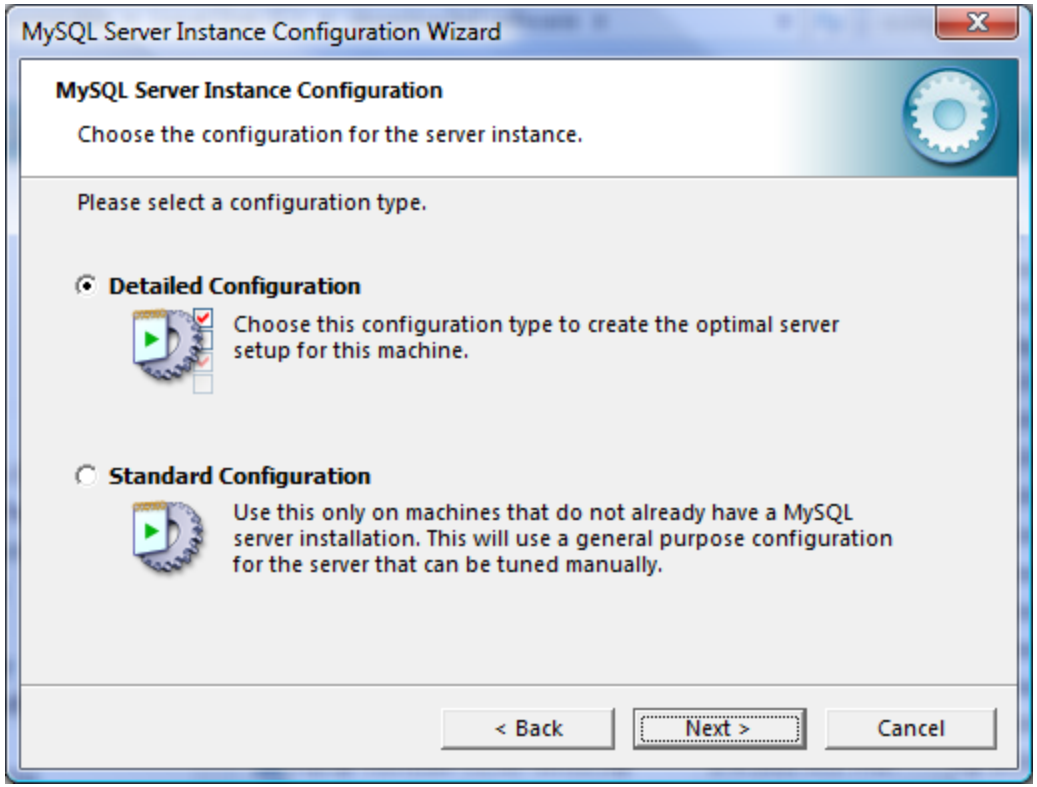
Click Finish

Installing MySQL 5.5.15 (cont.)

Initial server configuration window



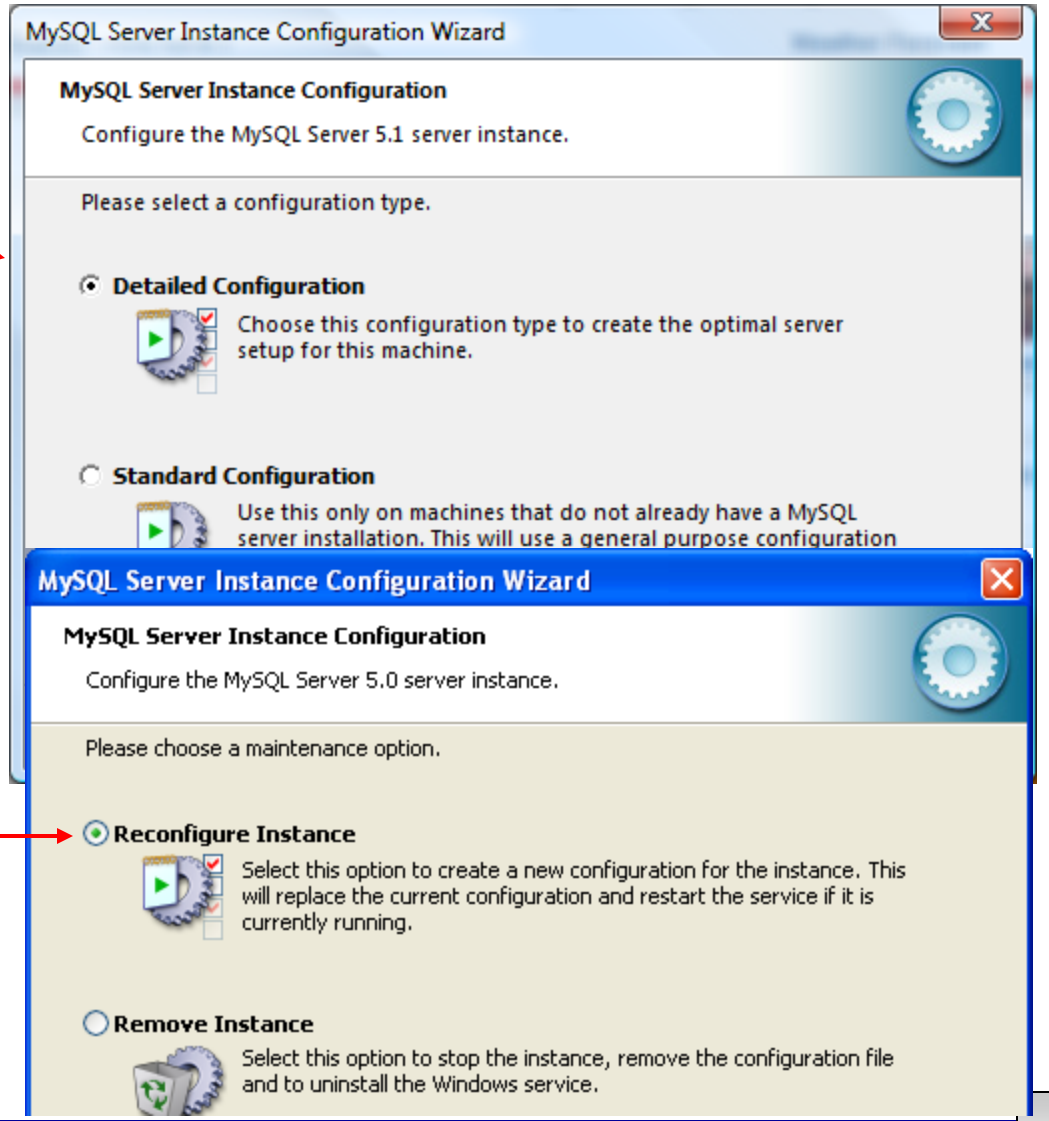
Installing MySQL 5.5.15 (cont.)



Installing MySQL 5.5.15 (cont.)

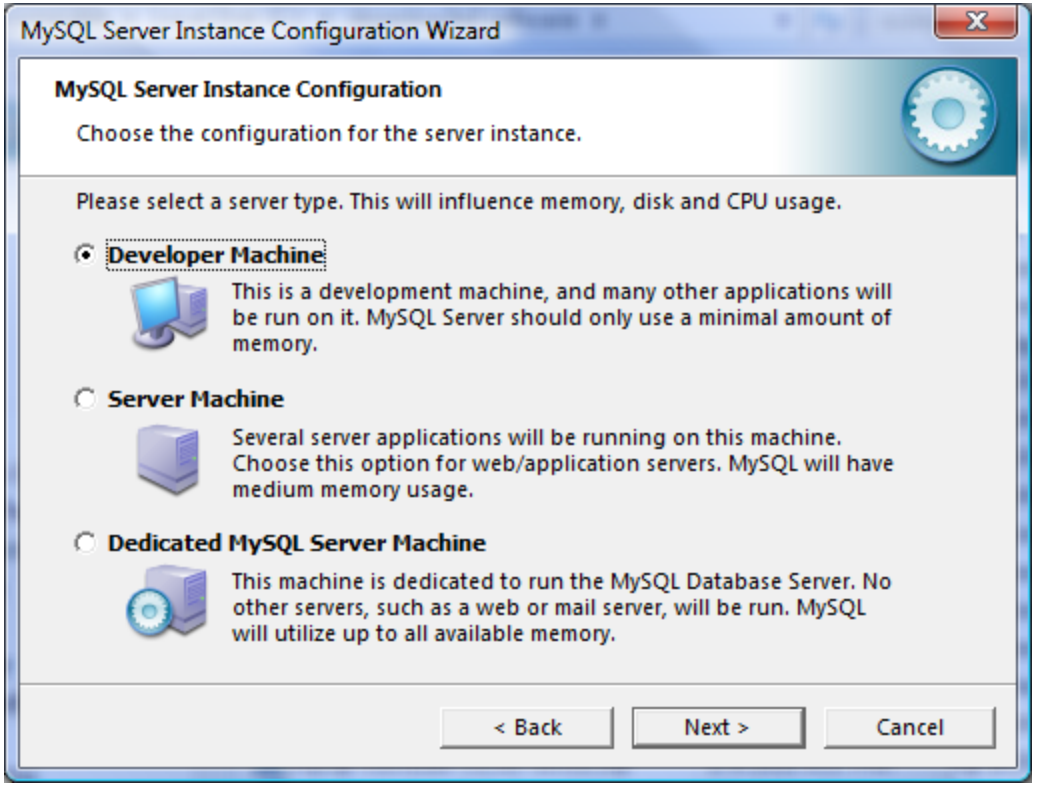
Your choice here. If you are not sure if there is already a MySQL server on your machine, choose the detailed configuration setting.

If you already have an instance of a MySQL server on your machine, you'll see this screen first, followed by the one above. Select reconfigure instance.



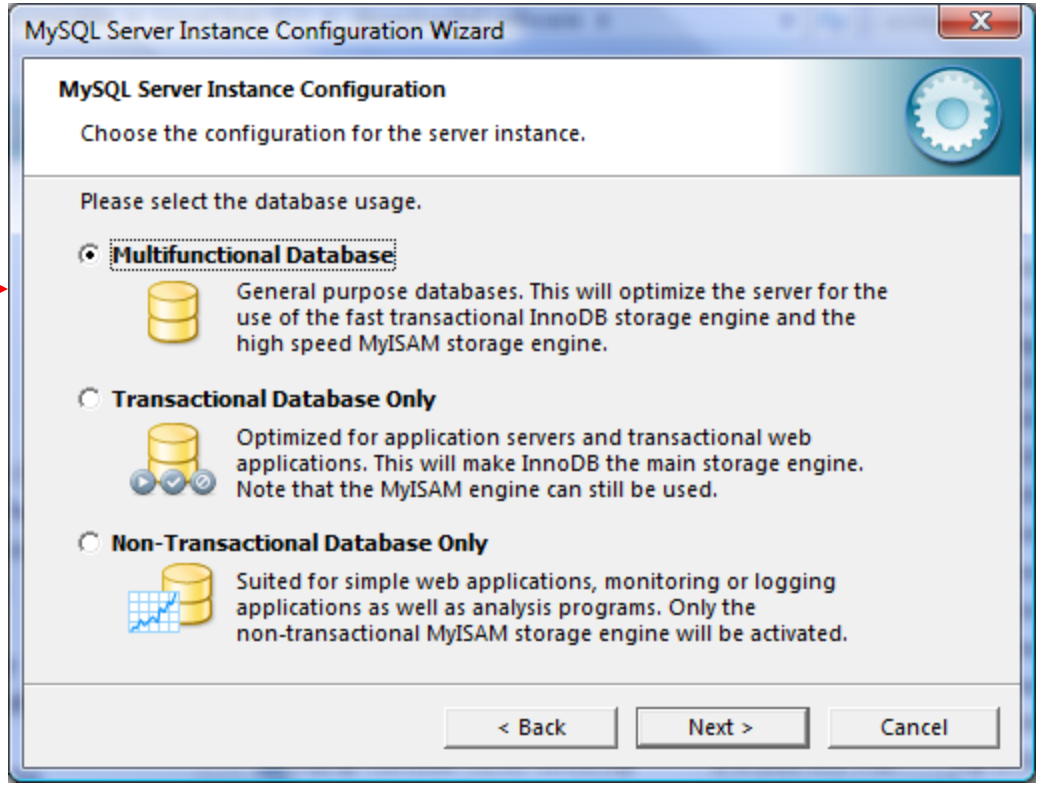
Installing MySQL 5.5.15 (cont.)

Choose the developer machine option



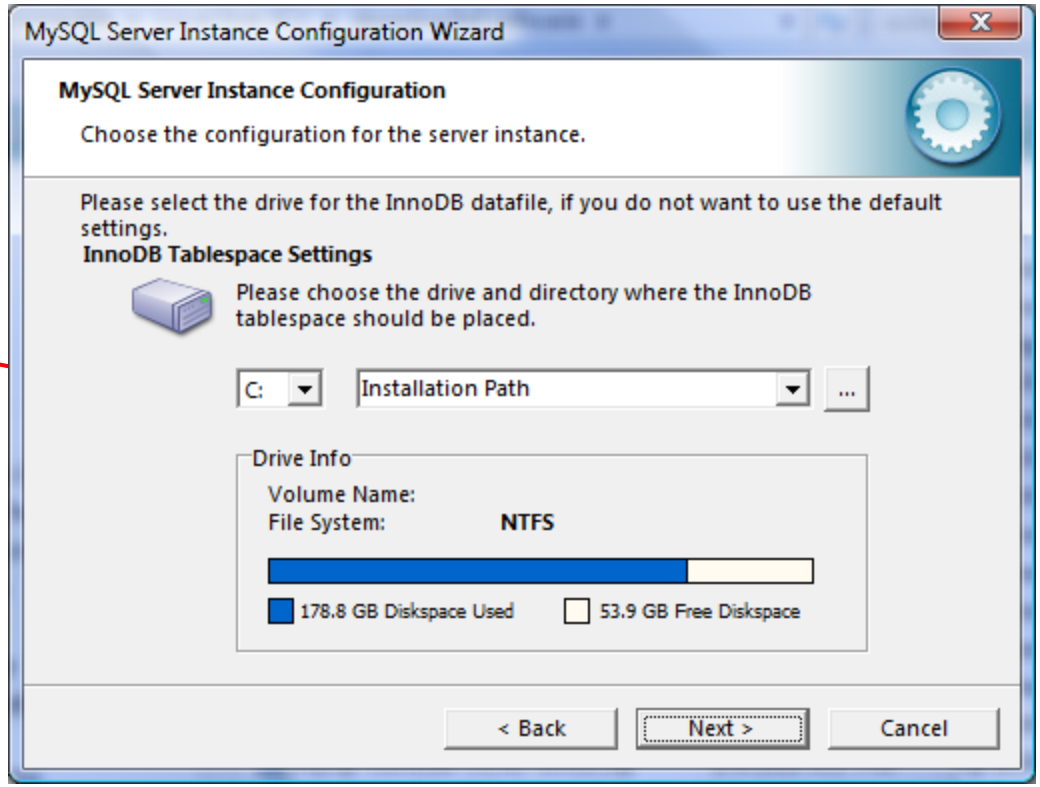
Installing MySQL 5.5.15 (cont.)

Choose the multifunctional database option



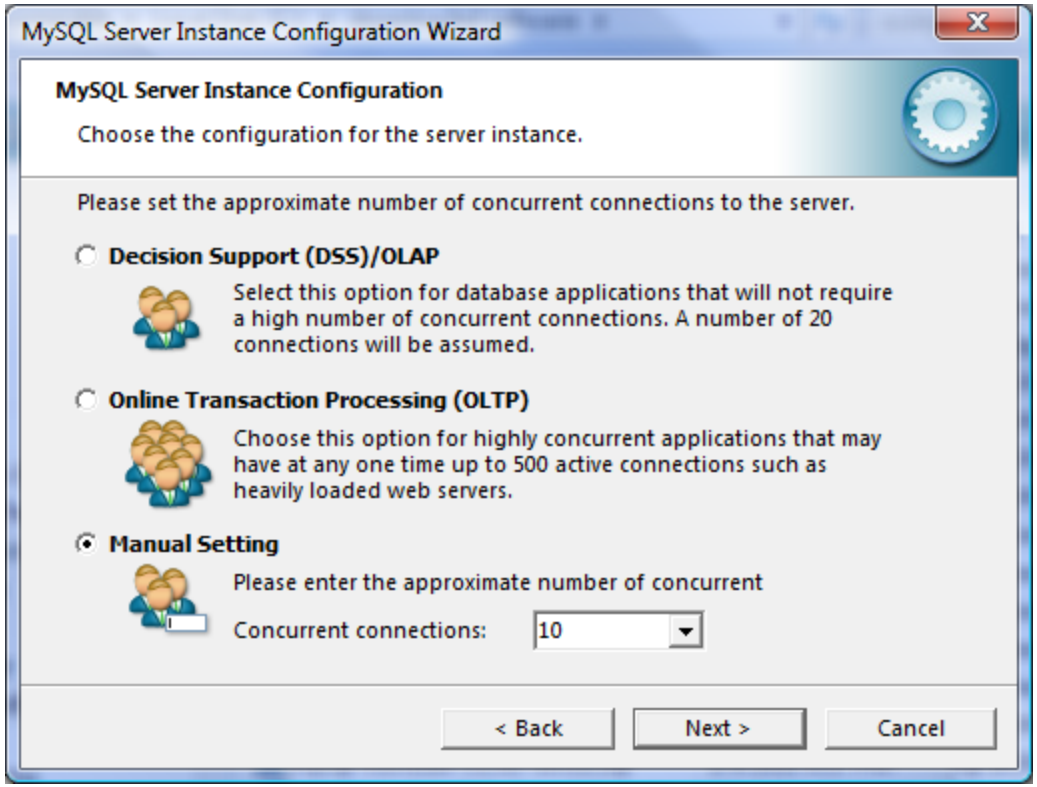
Installing MySQL 5.5.15 (cont.)

Choose the installation path to keep InnoDB tables in same area as other MySQL files



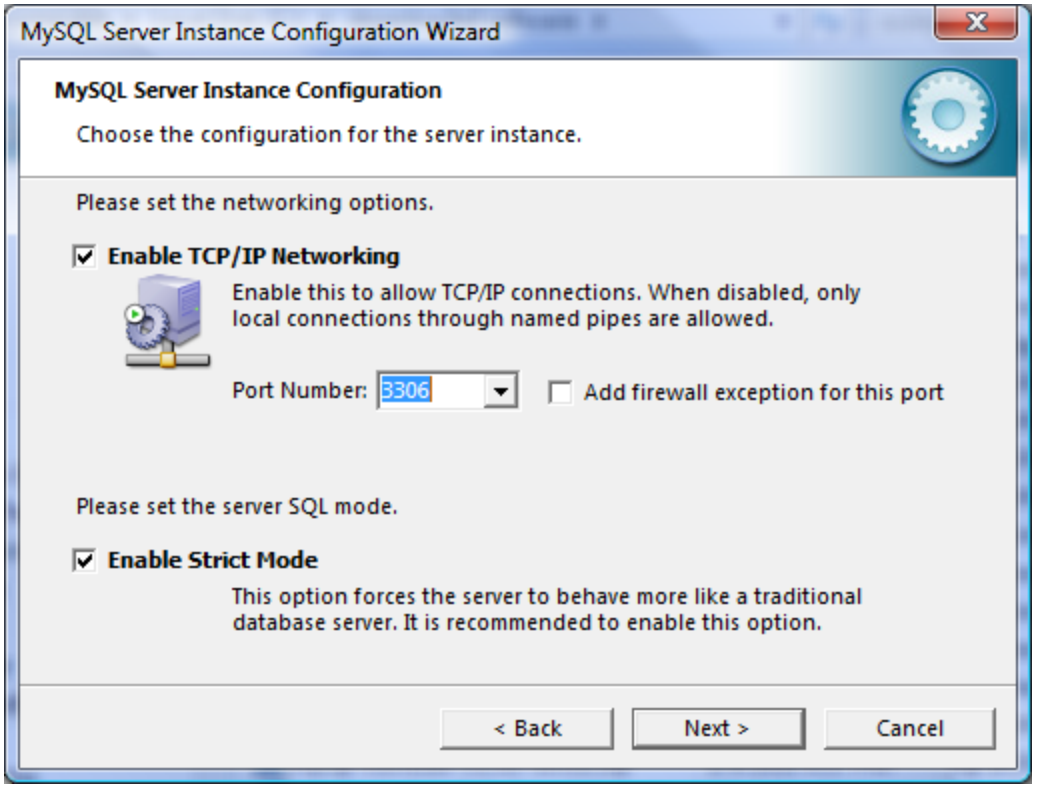
Installing MySQL 5.5.15 (cont.)

Select manual setting for this option. The default is 15, I set mine to 10, but you can use any number you would like, but pick something greater than 3 or 4.



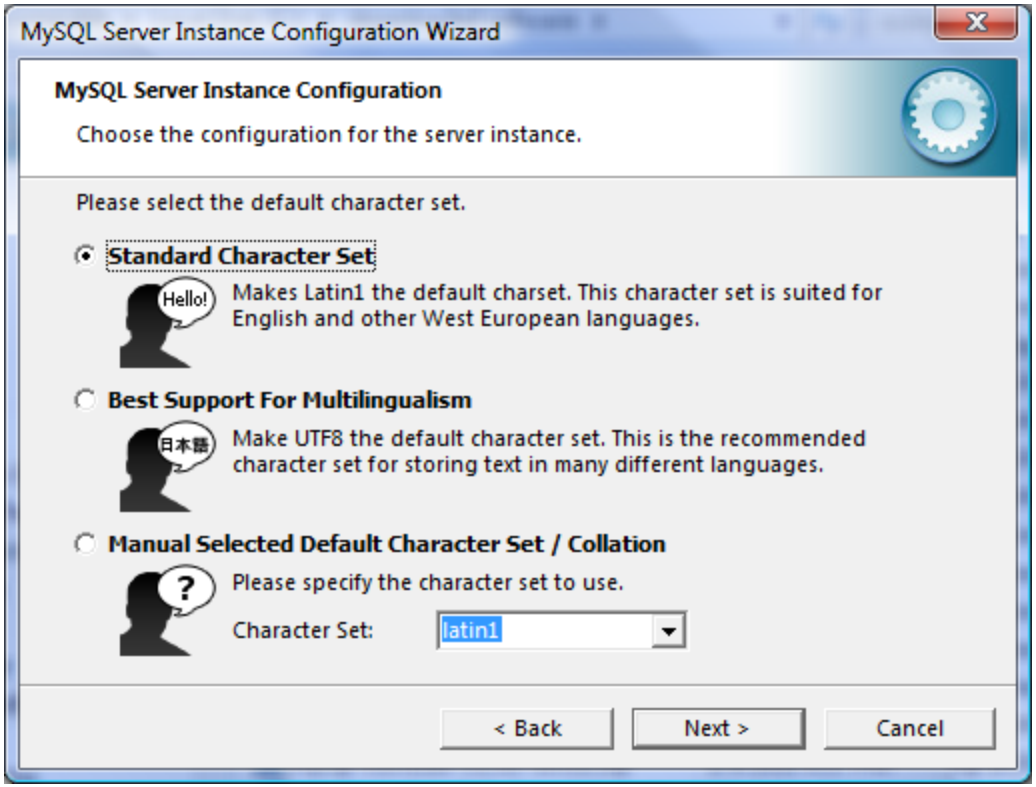
Installing MySQL 5.5.15 (cont.)

Accept all defaults in this window



Installing MySQL 5.5.15 (cont.)

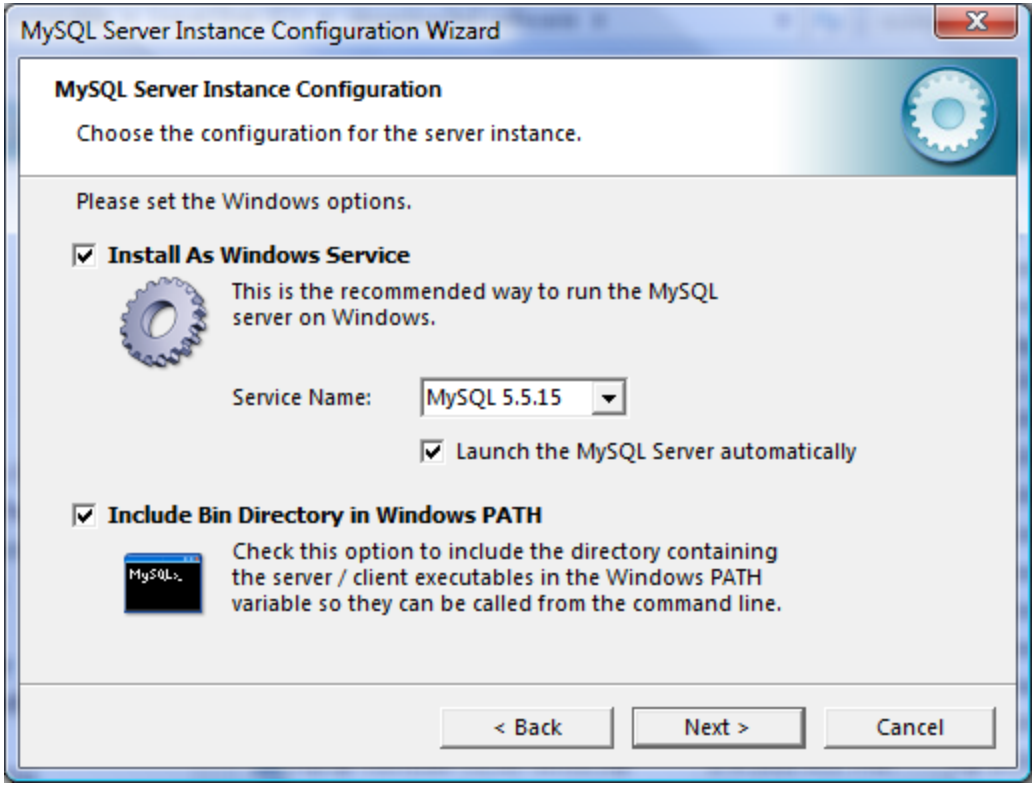
Your choice again



Installing MySQL 5.5.15 (cont.)

Accept default options

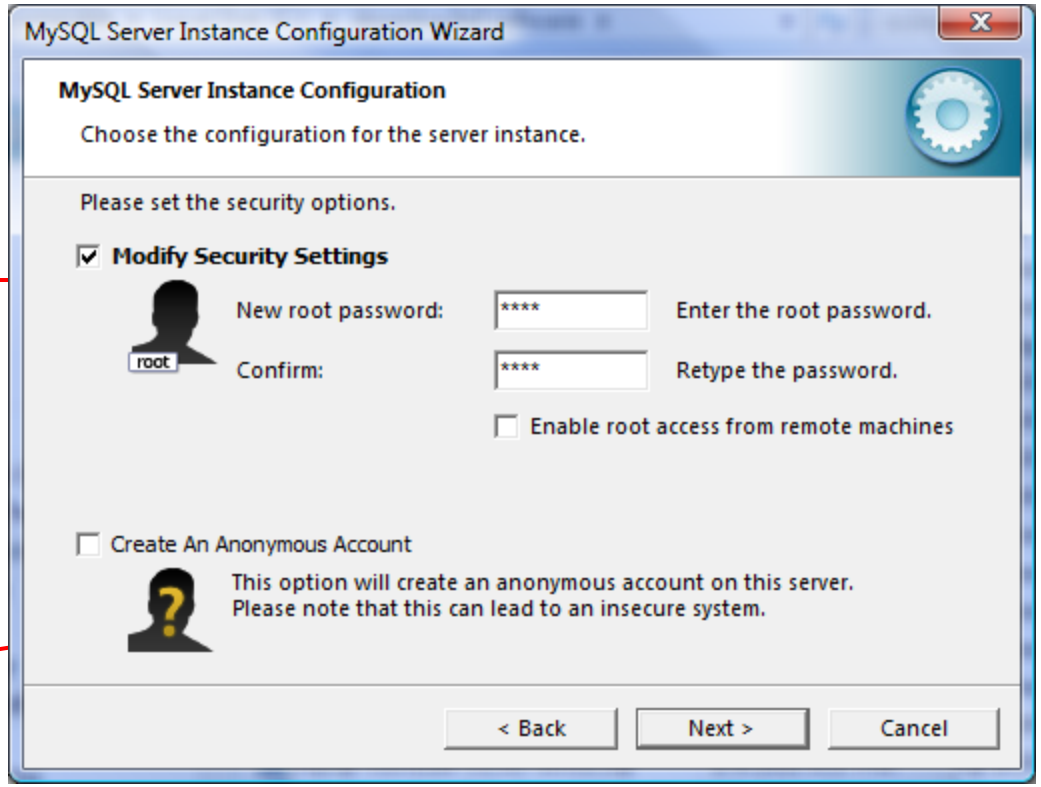
This option is not marked by default, but you can mark and accept it if you want to include MySQL file locations in your PATH statement.



Installing MySQL 5.5.15 (cont.)

Accept default setting and enter a password for the root (superuser with all privileges by default). Enabling root access from remote machines is only necessary if you will be accessing the DB as the root user from a remote machine – we will not be doing this in this course.

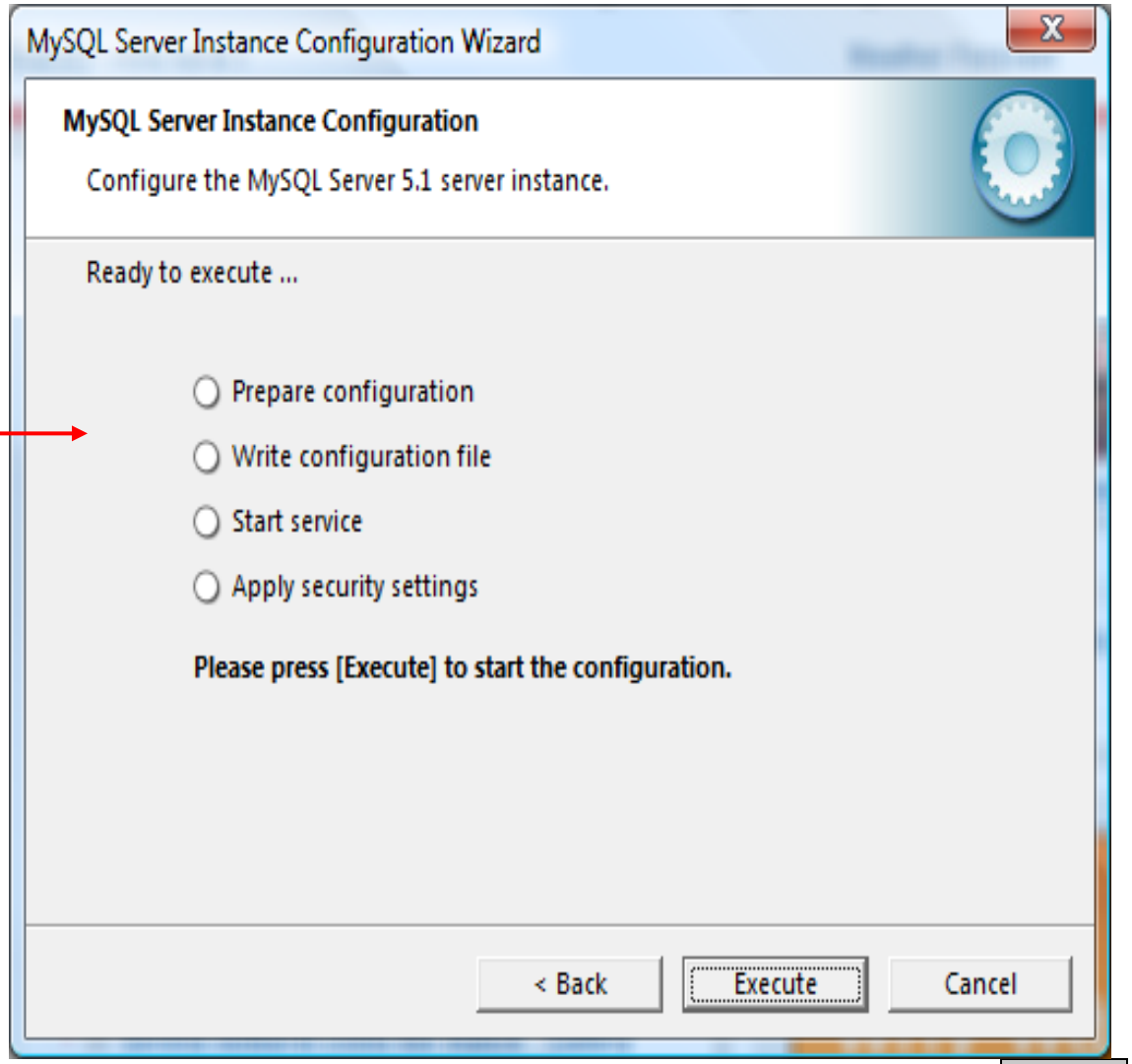
Do not enable this option



Installing MySQL 5.5.15 (cont.)

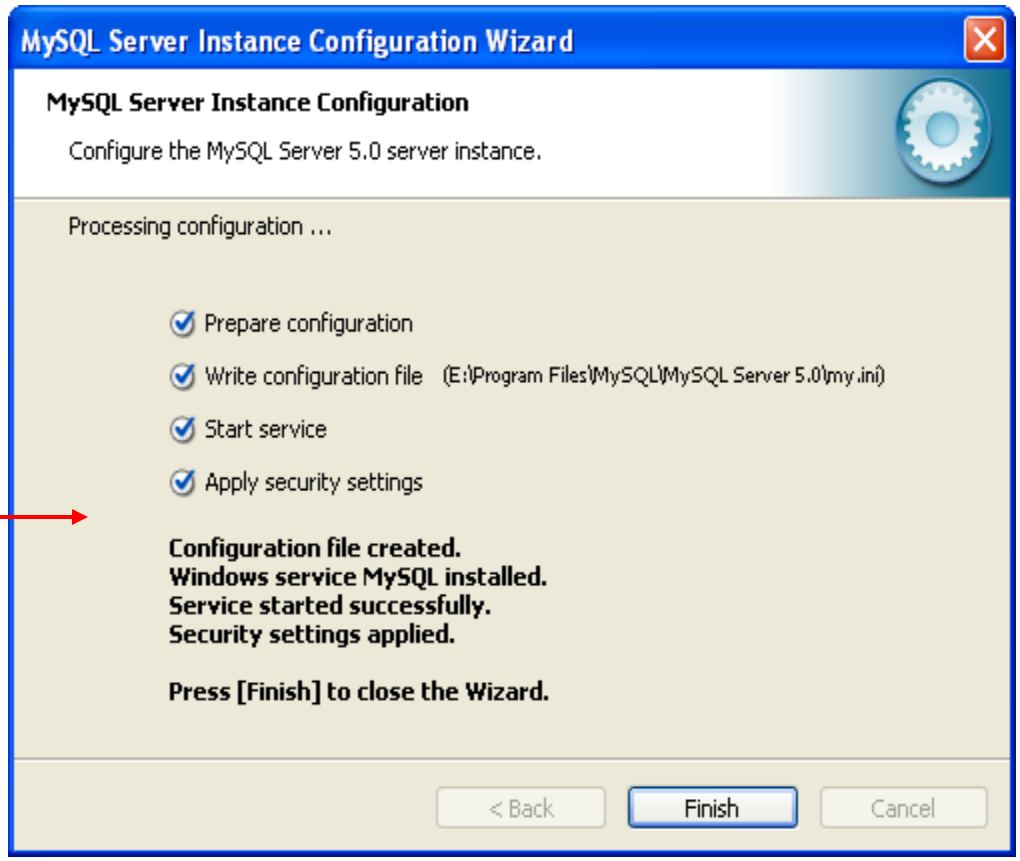
Configuration is about to begin. Now cross your fingers, toes, and anything else you have, take a deep breath, click the Execute button and close your eyes for a few seconds.

When they all have green check marks in them – you're good to go!



Installing MySQL 5.5.15 (cont.)

You've successfully installed MySQL!!



Installing/Configuring MySQL Workbench 5.2.35

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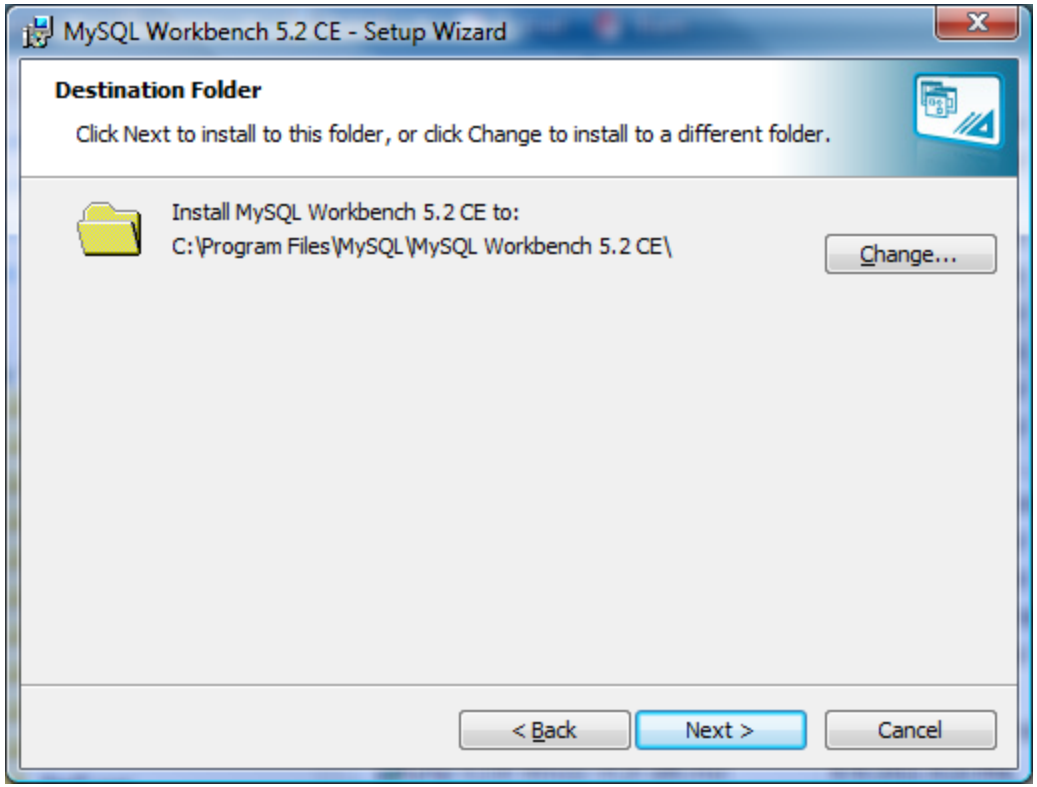
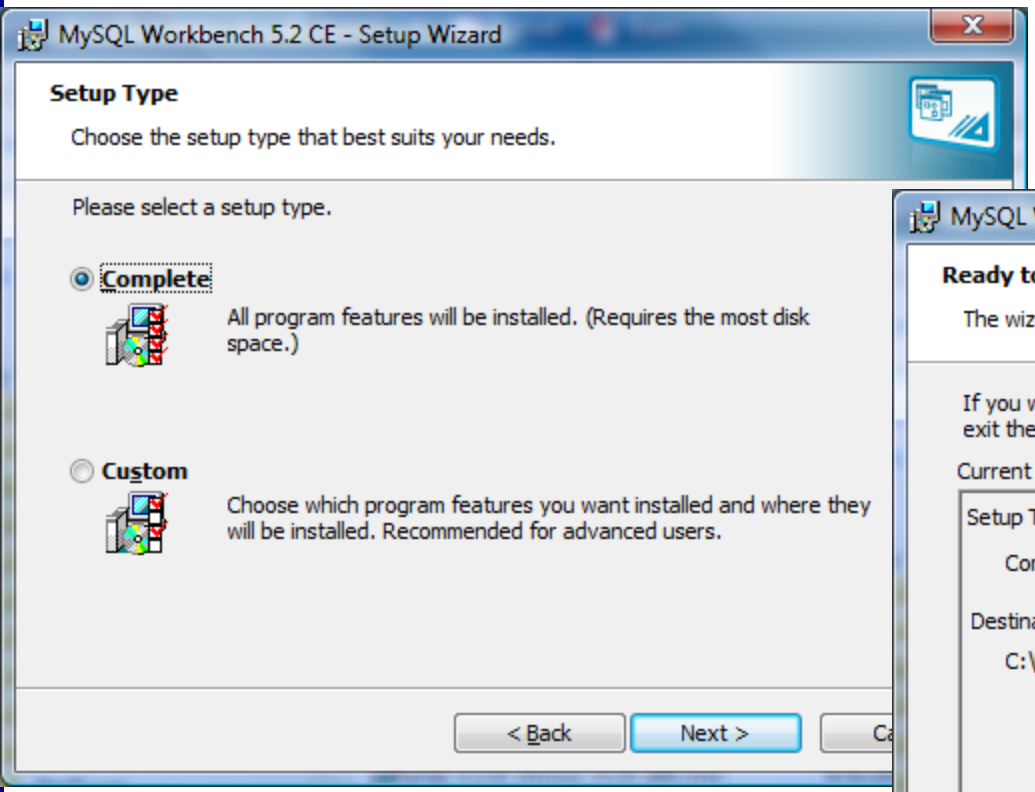
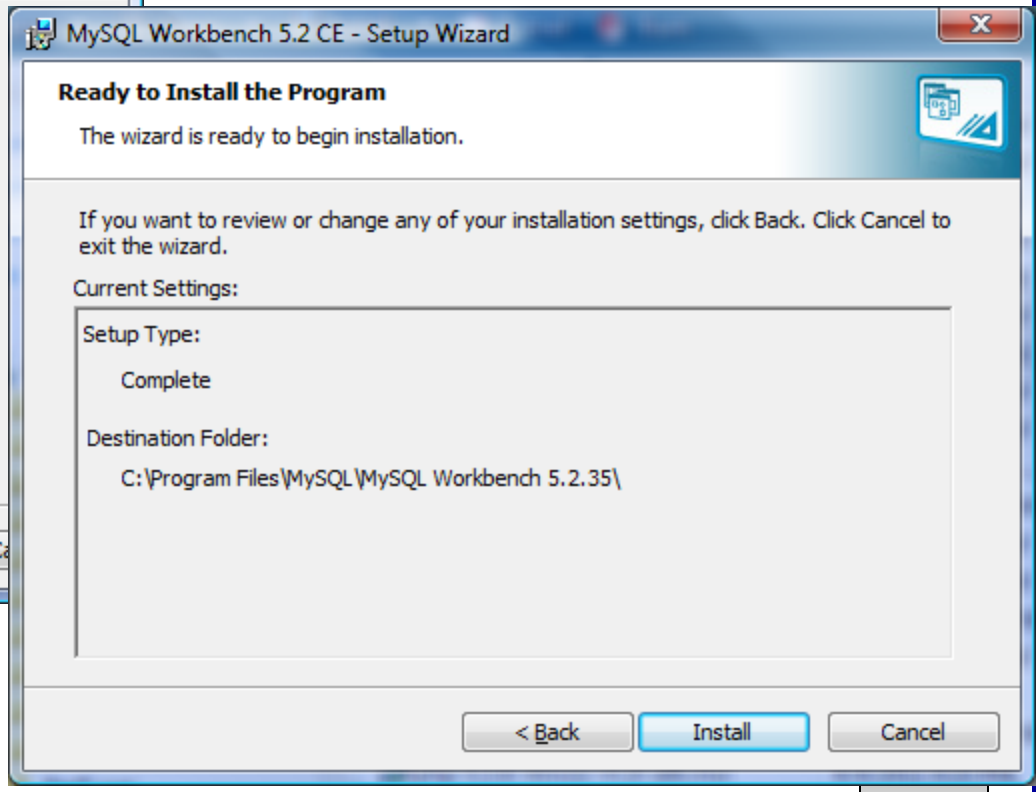
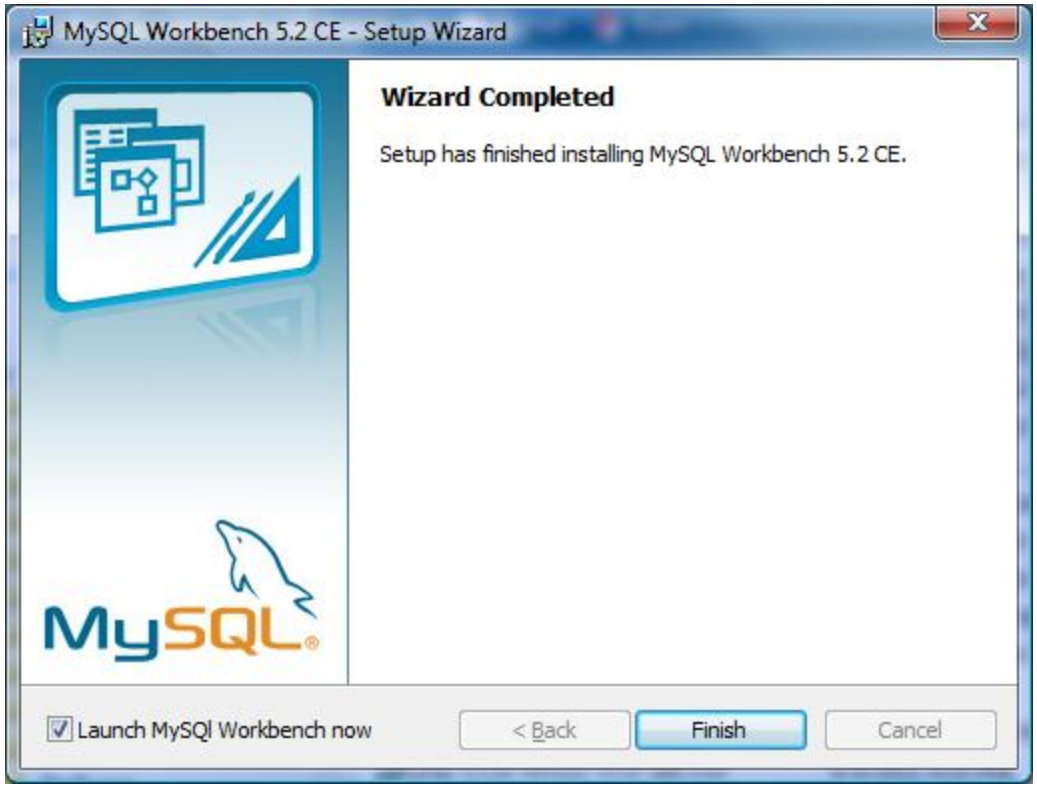


Installing/Configuring MySQL Workbench 5.2.35



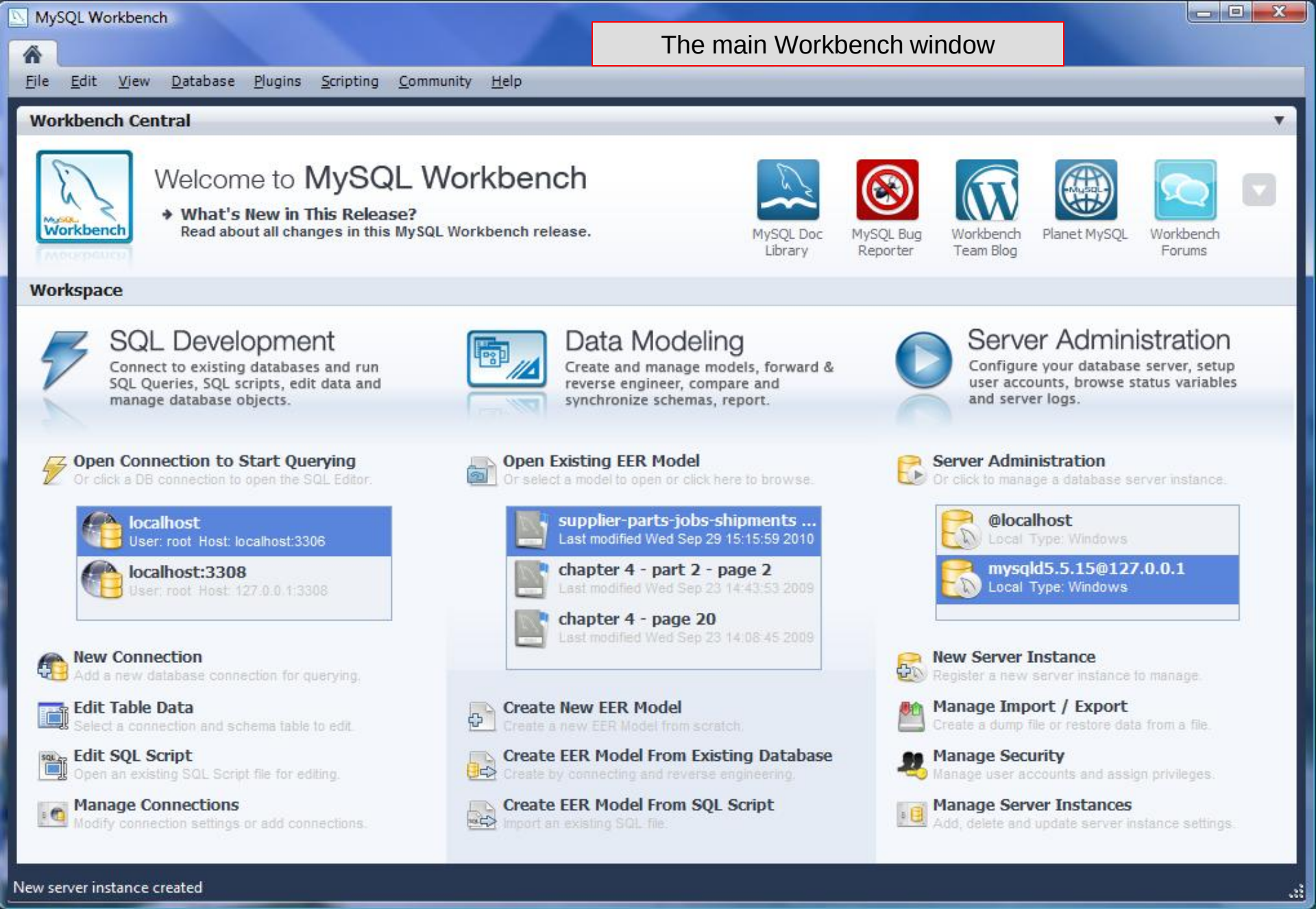


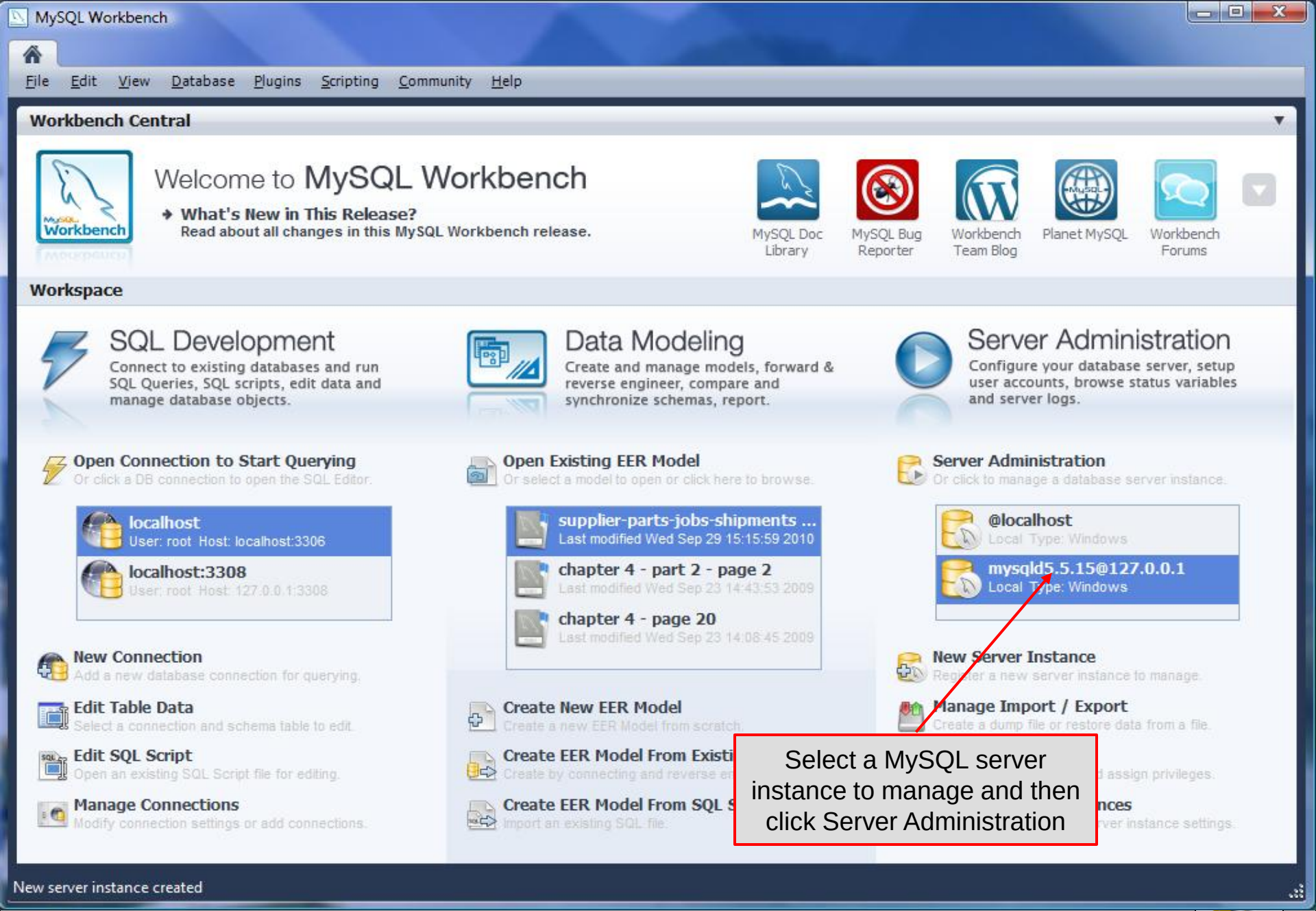
Installing/Configuring MySQL Workbench 5.2.35

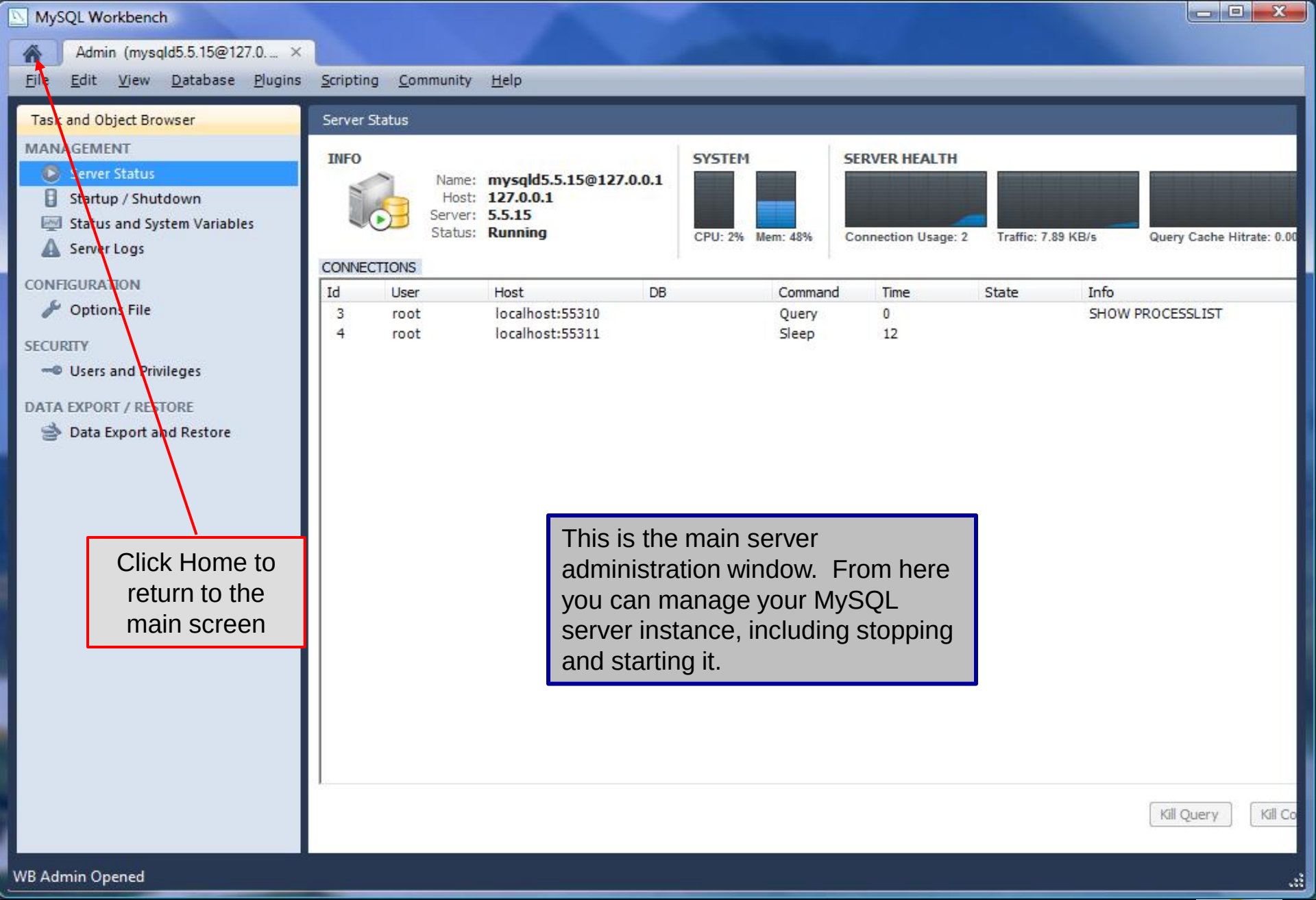


Installing/Configuring MySQL Workbench 5.2.35

The main Workbench window

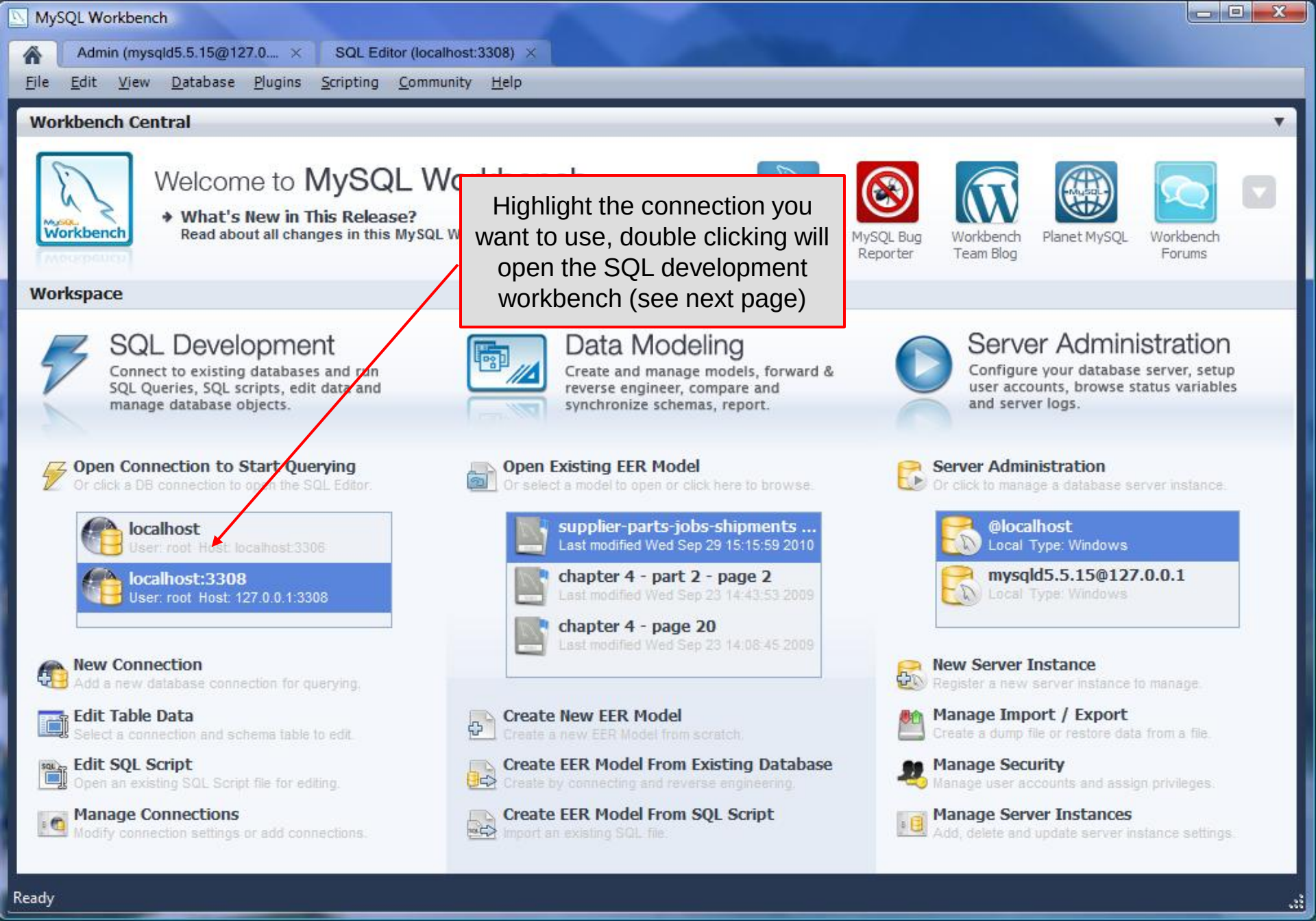



MySQL Workbench
File Edit View Database Plugins Scripting Community Help
Workbench Central
Welcome to MySQL Workbench
What's New in This Release?
Read about all changes in this MySQL Workbench release.
MySQL Doc Library
MySQL Bug Reporter
Workbench Team Blog
Planet MySQL
Workbench Forums
Workspace
SQL Development
Connect to existing databases and run SQL Queries, SQL scripts, edit data and manage database objects.
Data Modeling
Create and manage models, forward & reverse engineer, compare and synchronize schemas, report.
Server Administration
Configure your database server, setup user accounts, browse status variables and server logs.
Open Connection to Start Querying
Or click a DB connection to open the SQL Editor.
localhost
User: root Host: localhost:3306
localhost:3308
User: root Host: 127.0.0.1:3308
Open Existing EER Model
Or select a model to open or click here to browse.
supplier-parts-jobs-shipments ...
Last modified Wed Sep 29 15:15:59 2010
chapter 4 - part 2 - page 2
Last modified Wed Sep 23 14:43:53 2009
chapter 4 - page 20
Last modified Wed Sep 23 14:08:45 2009
Server Administration
Or click to manage a database server instance.
@localhost
Local Type: Windows
mysqld5.5.15@127.0.0.1
Local Type: Windows
New Connection
Add a new database connection for querying.
Edit Table Data
Select a connection and schema table to edit.
Edit SQL Script
Open an existing SQL Script file for editing.
Manage Connections
Modify connection settings or add connections.
Create New EER Model
Create a new EER Model from scratch.
New Server Instance
Manage Import / Export
Create a dump file or restore data from a file.
Select a MySQL server instance to manage and then click Server Administration
New server instance created

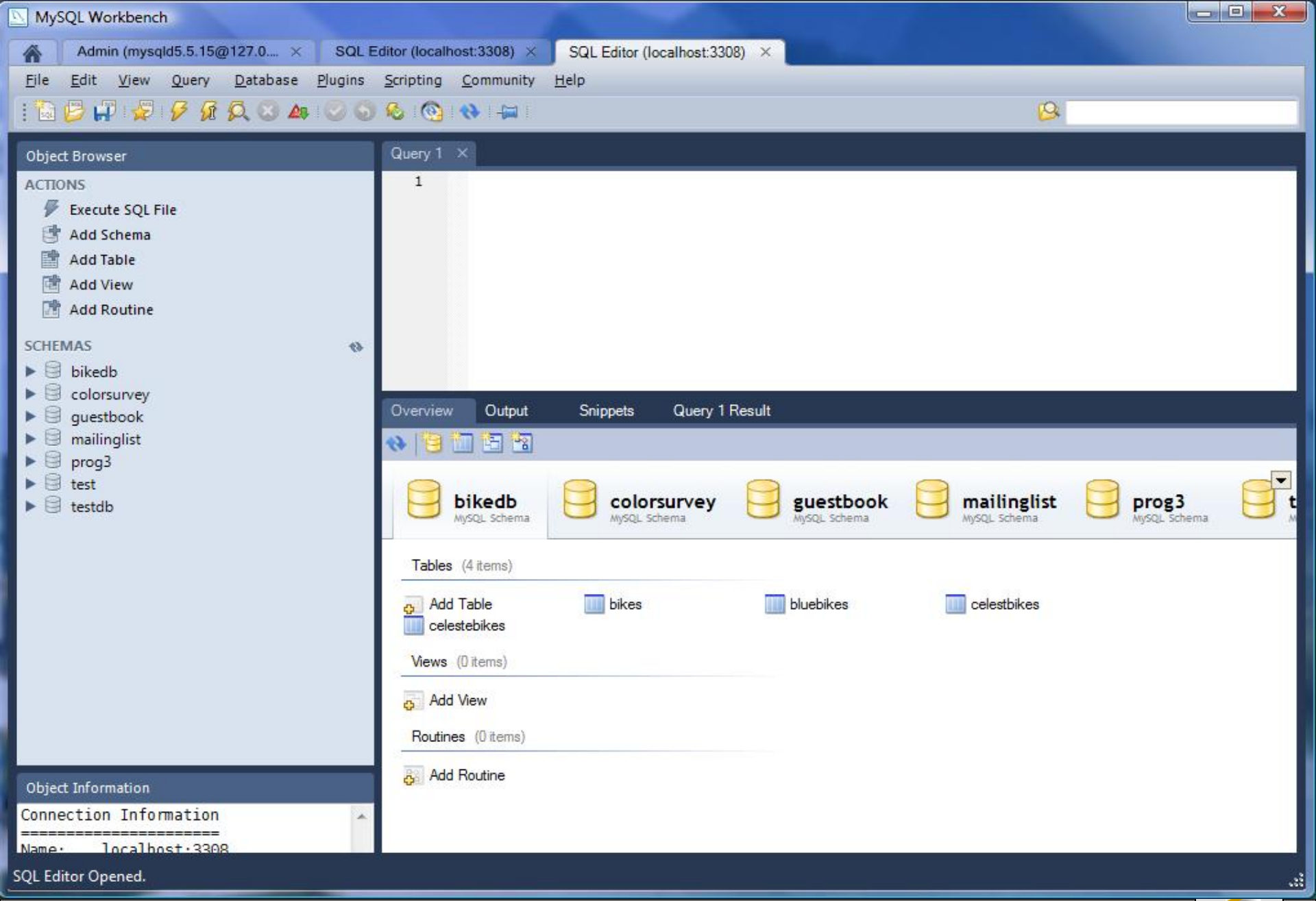


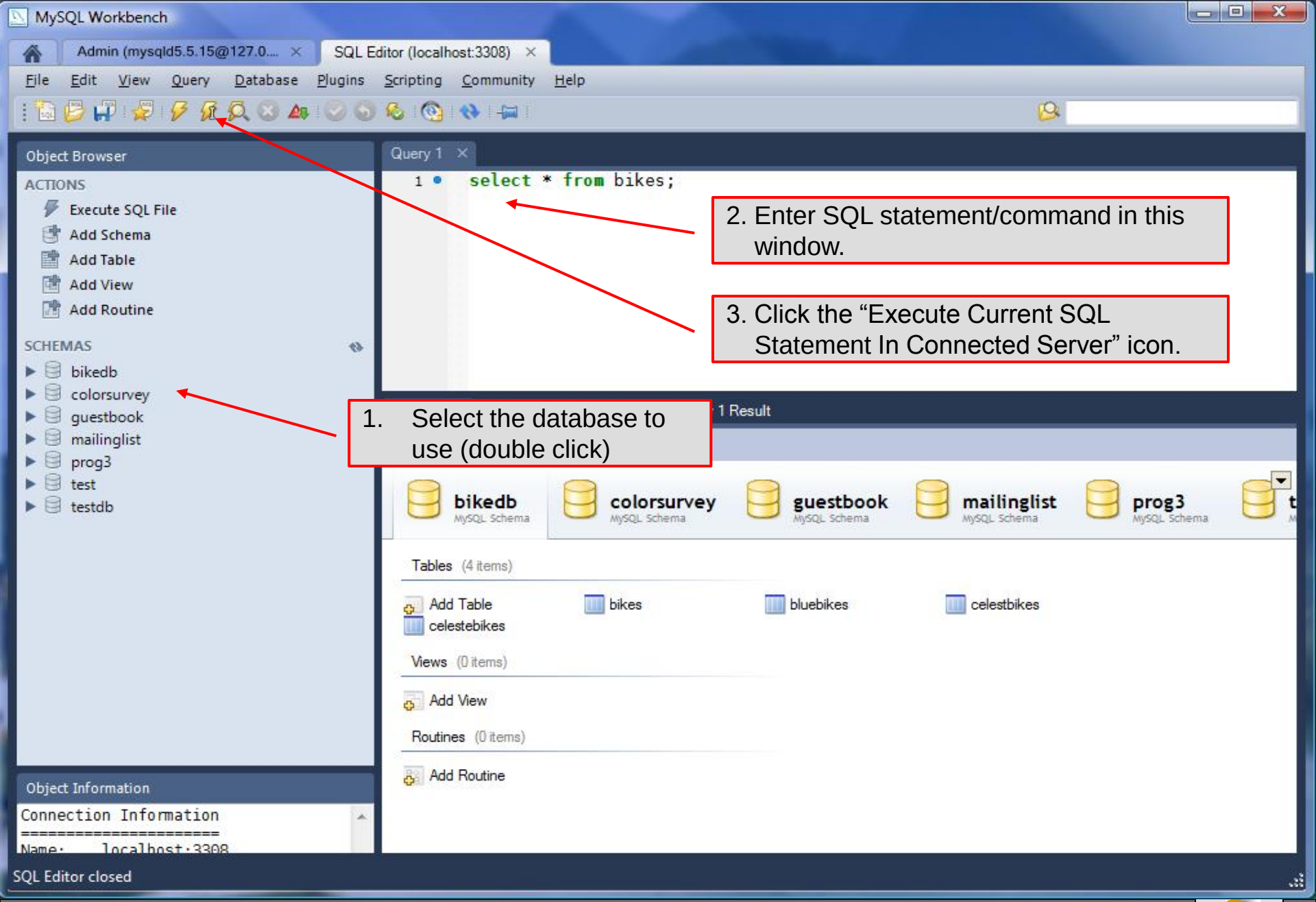
Click Home to return to the main screen

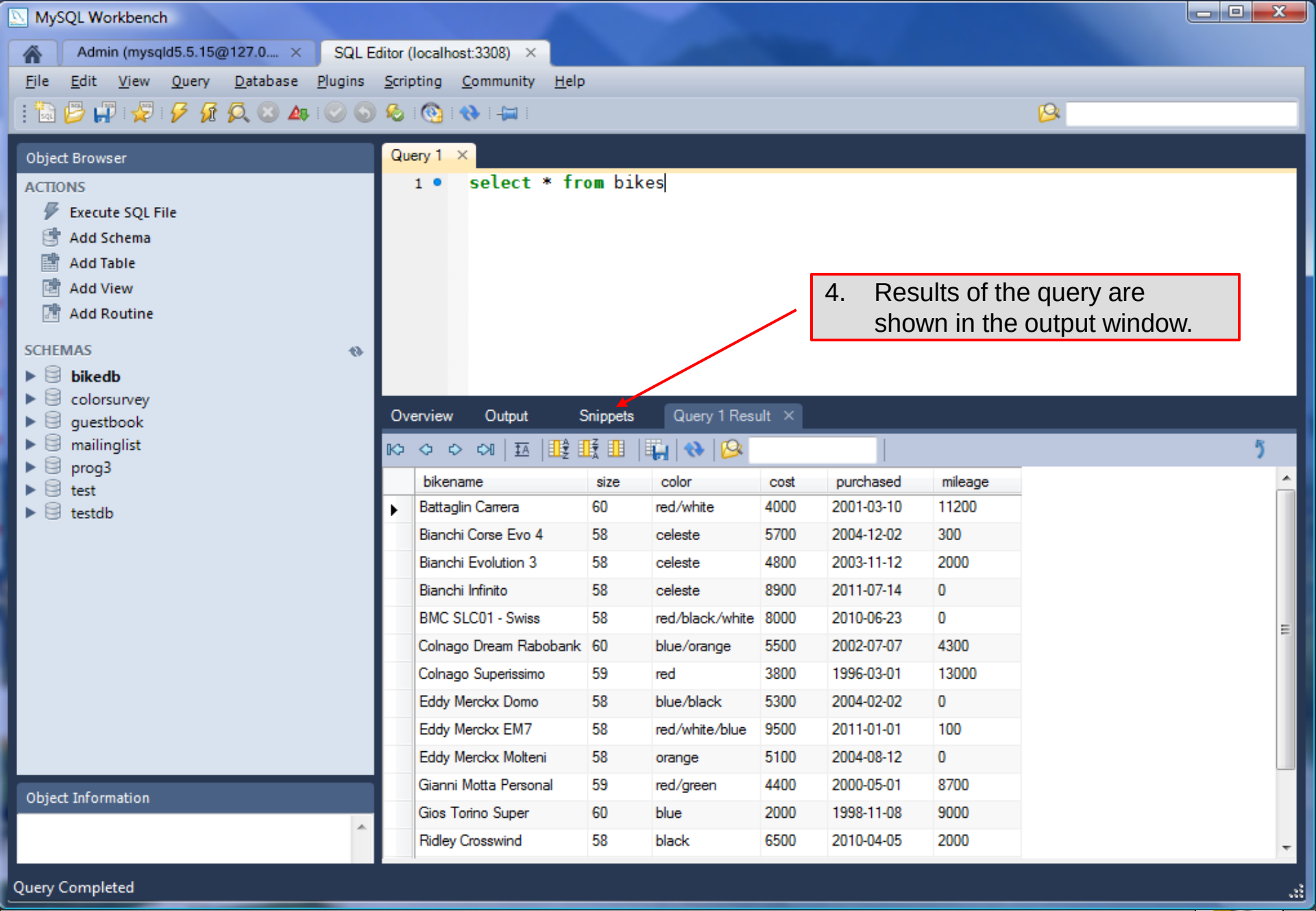
This is the main server administration window. From here you can manage your MySQL server instance, including stopping and starting it.

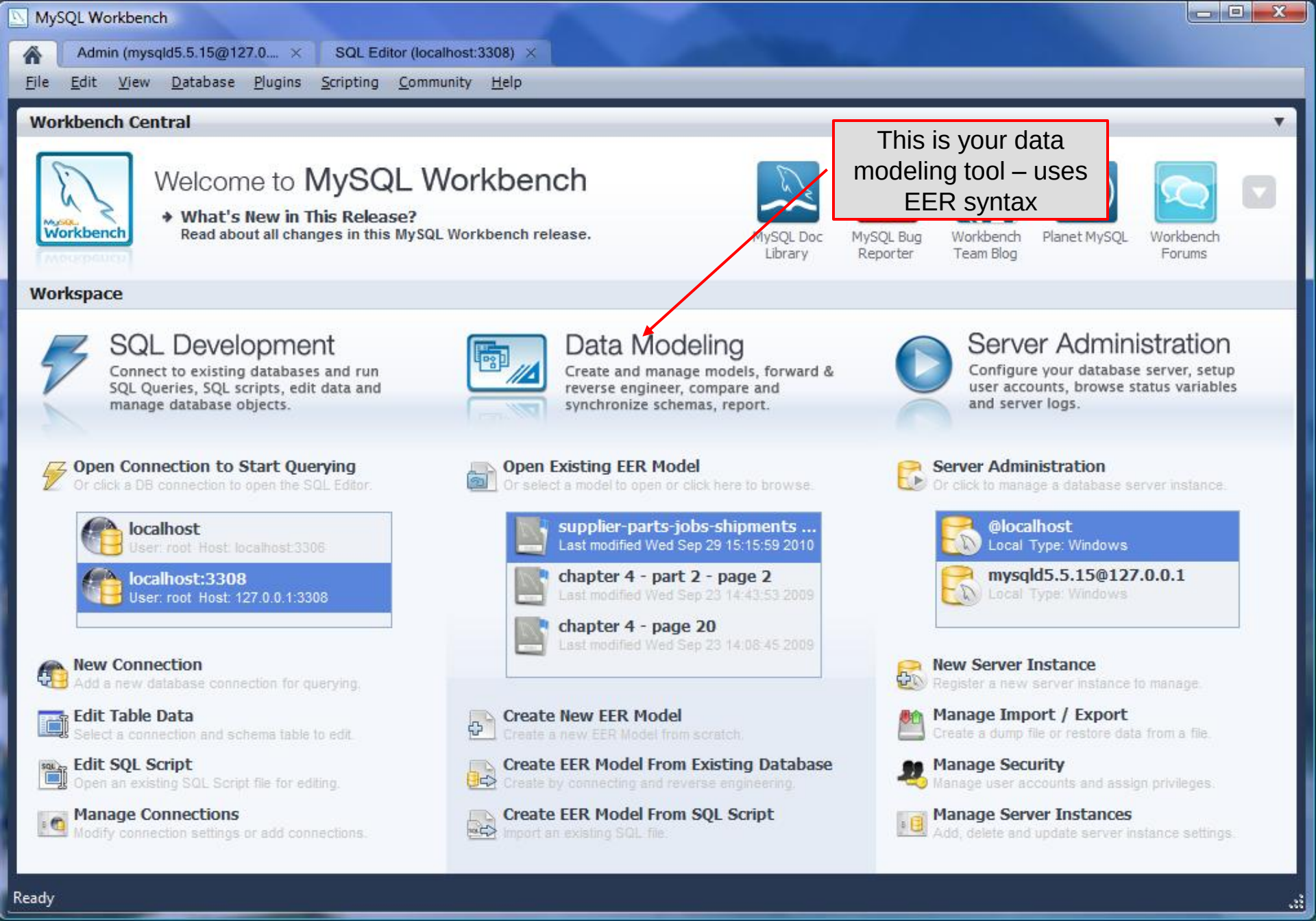


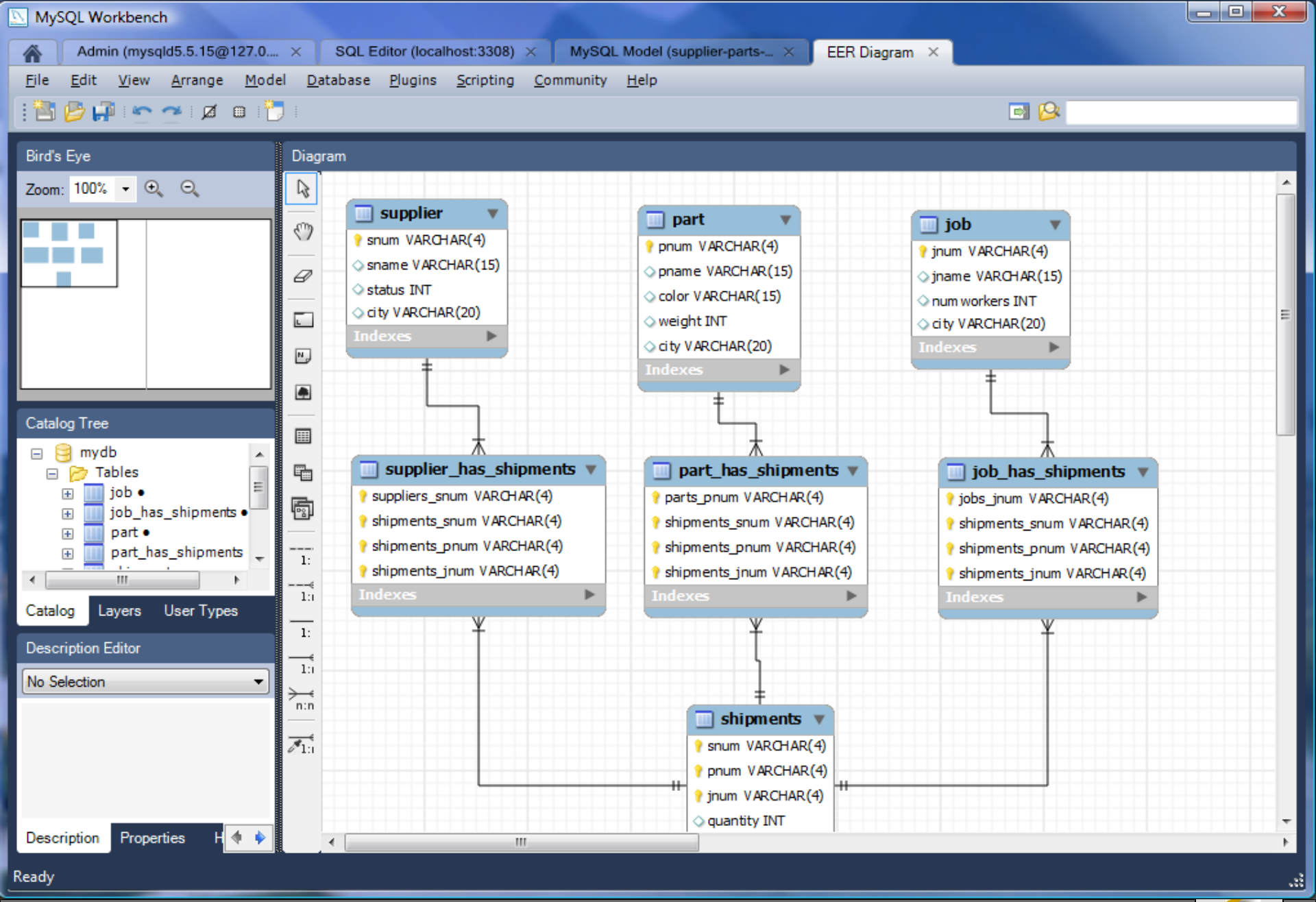
Highlight the connection you want to use, double clicking will open the SQL development workbench (see next page)


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
SQL Editor (localhost:3308)
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
test
testdb
Query 1
1
Overview
Output
Snippets
Query 1 Result
bikedb MySQL Schema
colorsurvey MySQL Schema
guestbook MySQL Schema
mailinglist MySQL Schema
prog3 MySQL Schema
Tables (4 items)
Add Table
bikes
bluebikes
celestbikes
celestebikes
Views (0 items)
Add View
Routines (0 items)
Add Routine
Object Information
Connection Information
Name: localhost:3308
SQL Editor Opened.


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
test
testdb
Query 1
1 select * from bikes;
2. Enter SQL statement/command in this window.
3. Click the "Execute Current SQL Statement In Connected Server" icon.
1. Select the database to use (double click)
1 Result
bikedb MySQL Schema
colorsurvey MySQL Schema
guestbook MySQL Schema
mailinglist MySQL Schema
prog3 MySQL Schema
Tables (4 items)
Add Table
bikes
bluebikes
celestbikes
celestebikes
Views (0 items)
Add View
Routines (0 items)
Add Routine
Object Information
Connection Information
Name: localhost:3308
SQL Editor closed

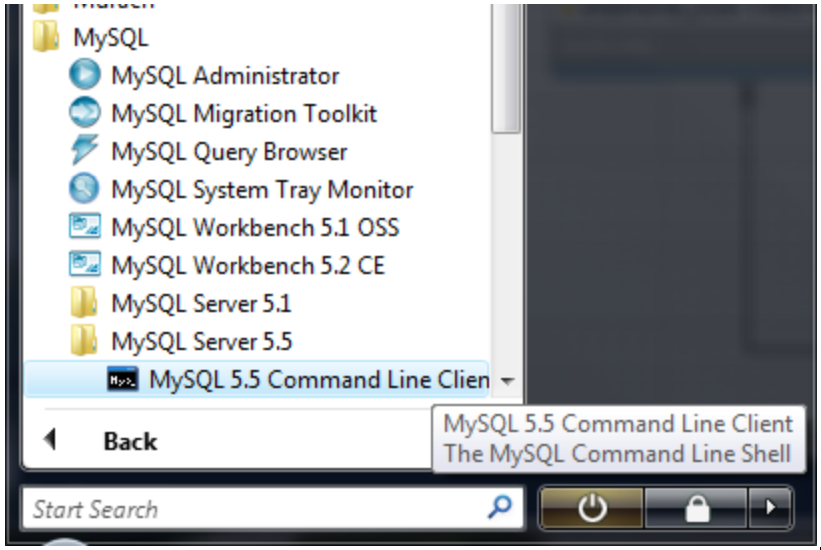

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
test
testdb
Object Information
Query 1
1 select * from bikes
4. Results of the query are shown in the output window.
Overview Output Snippets Query 1 Result
bikename size color cost purchased mileage
Battaglin Carrera 60 red/white 4000 2001-03-10 11200
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
BMC SLC01 - Swiss 58 red/black/white 8000 2010-06-23 0
Colnago Dream Rabobank 60 blue/orange 5500 2002-07-07 4300
Colnago Superissimo 59 red 3800 1996-03-01 13000
Eddy Merckx Domo 58 blue/black 5300 2004-02-02 0
Eddy Merckx EM7 58 red/white/blue 9500 2011-01-01 100
Eddy Merckx Molteni 58 orange 5100 2004-08-12 0
Gianni Motta Personal 59 red/green 4400 2000-05-01 8700
Gios Torino Super 60 blue 2000 1998-11-08 9000
Ridley Crosswind 58 black 6500 2010-04-05 2000
Query Completed


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
File Edit View Database Plugins Scripting Community Help
Workbench Central
Welcome to MySQL Workbench
What's New in This Release?
Read about all changes in this MySQL Workbench release.
MySQL Doc Library
MySQL Bug Reporter
Workbench Team Blog
Planet MySQL
Workbench Forums
This is your data modeling tool – uses EER syntax
Workspace
SQL Development
Connect to existing databases and run SQL Queries, SQL scripts, edit data and manage database objects.
Data Modeling
Create and manage models, forward & reverse engineer, compare and synchronize schemas, report.
Server Administration
Configure your database server, setup user accounts, browse status variables and server logs.
Open Connection to Start Querying
Or click a DB connection to open the SQL Editor.
localhost
User: root Host: localhost:3306
localhost:3308
User: root Host: 127.0.0.1:3308
Open Existing EER Model
Or select a model to open or click here to browse.
supplier-parts-jobs-shipments ...
Last modified Wed Sep 29 15:15:59 2010
chapter 4 - part 2 - page 2
Last modified Wed Sep 23 14:43:53 2009
chapter 4 - page 20
Last modified Wed Sep 23 14:08:45 2009
Server Administration
Or click to manage a database server instance.
@localhost
Local Type: Windows
mysqld5.5.15@127.0.0.1
Local Type: Windows
New Connection
Add a new database connection for querying.
Edit Table Data
Select a connection and schema table to edit.
Edit SQL Script
Open an existing SQL Script file for editing.
Manage Connections
Modify connection settings or add connections.
Create New EER Model
Create a new EER Model from scratch.
Create EER Model From Existing Database
Create by connecting and reverse engineering.
Create EER Model From SQL Script
Import an existing SQL file.
New Server Instance
Register a new server instance to manage.
Manage Import / Export
Create a dump file or restore data from a file.
Manage Security
Manage user accounts and assign privileges.
Manage Server Instances
Add, delete and update server instance settings.
Ready

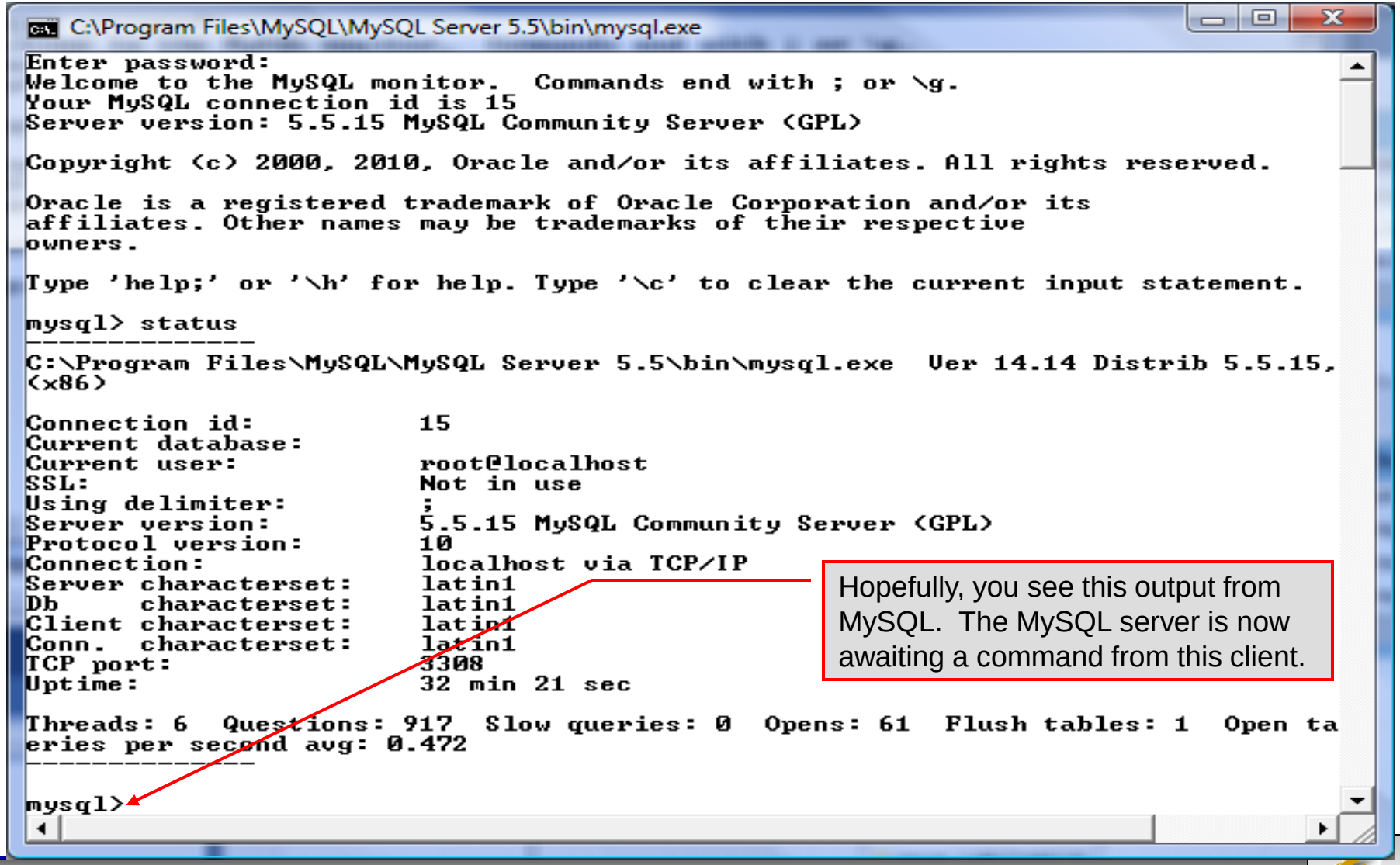

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Arrange Model Database Plugins Scripting Community Help
Bird's Eye
Zoom: 100%
Catalog Tree
mydb
Tables
job
job_has_shipments
part
part_has_shipments
Catalog Layers User Types
Description Editor
No Selection
Description Properties
Diagram
supplier
snum VARCHAR(4)
sname VARCHAR(15)
status INT
city VARCHAR(20)
Indexes
part
pnum VARCHAR(4)
pname VARCHAR(15)
color VARCHAR(15)
weight INT
city VARCHAR(20)
Indexes
job
jnum VARCHAR(4)
jname VARCHAR(15)
num workers INT
city VARCHAR(20)
Indexes
supplier_has_shipments
suppliers_snum VARCHAR(4)
shipments_snum VARCHAR(4)
shipments_pnum VARCHAR(4)
shipments_jnum VARCHAR(4)
Indexes
part_has_shipments
parts_pnum VARCHAR(4)
shipments_snum VARCHAR(4)
shipments_pnum VARCHAR(4)
shipments_jnum VARCHAR(4)
Indexes
job_has_shipments
jobs_jnum VARCHAR(4)
shipments_snum VARCHAR(4)
shipments_pnum VARCHAR(4)
shipments_jnum VARCHAR(4)
Indexes
shipments
snum VARCHAR(4)
pnum VARCHAR(4)
jnum VARCHAR(4)
quantity INT
Ready

Running MySQL 5.5.15

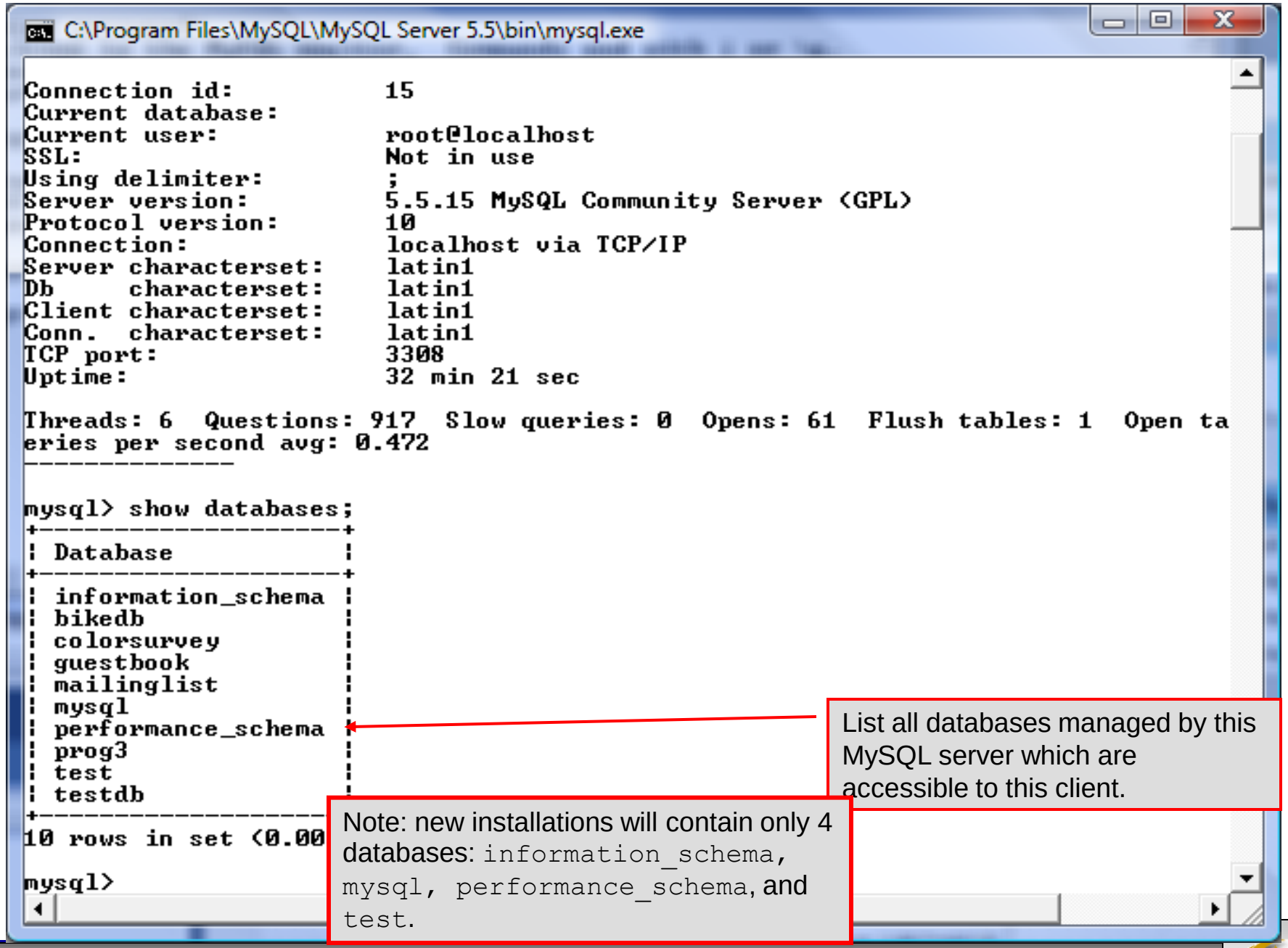
- For this course, pretty much everything you'll need to be able to do with your database project can be done via the Workbench tools.
- Although, if you prefer, or would like to see a slightly different perspective, the MySQL server also includes a basic MySQL Command Line.
- See the next page.

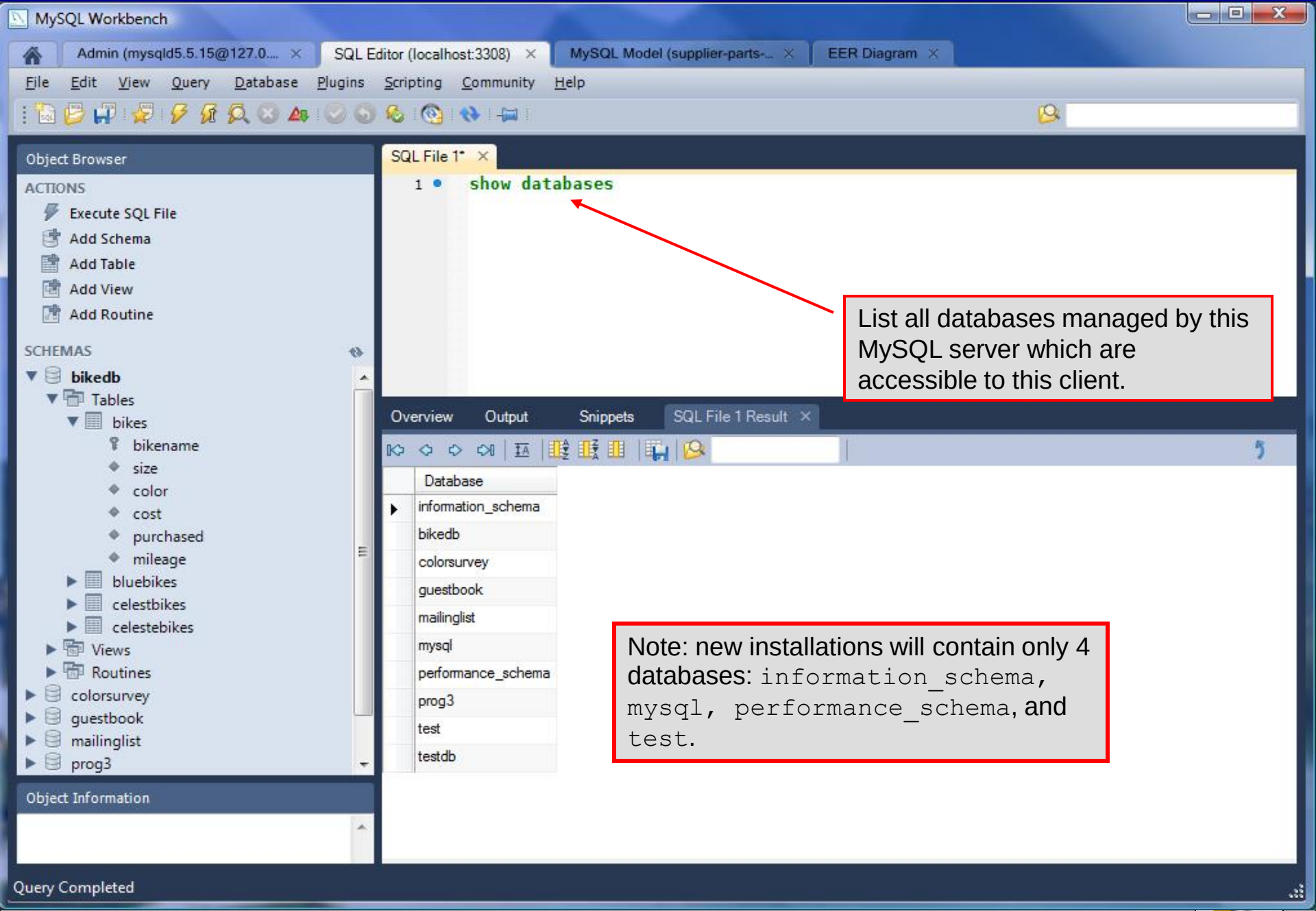


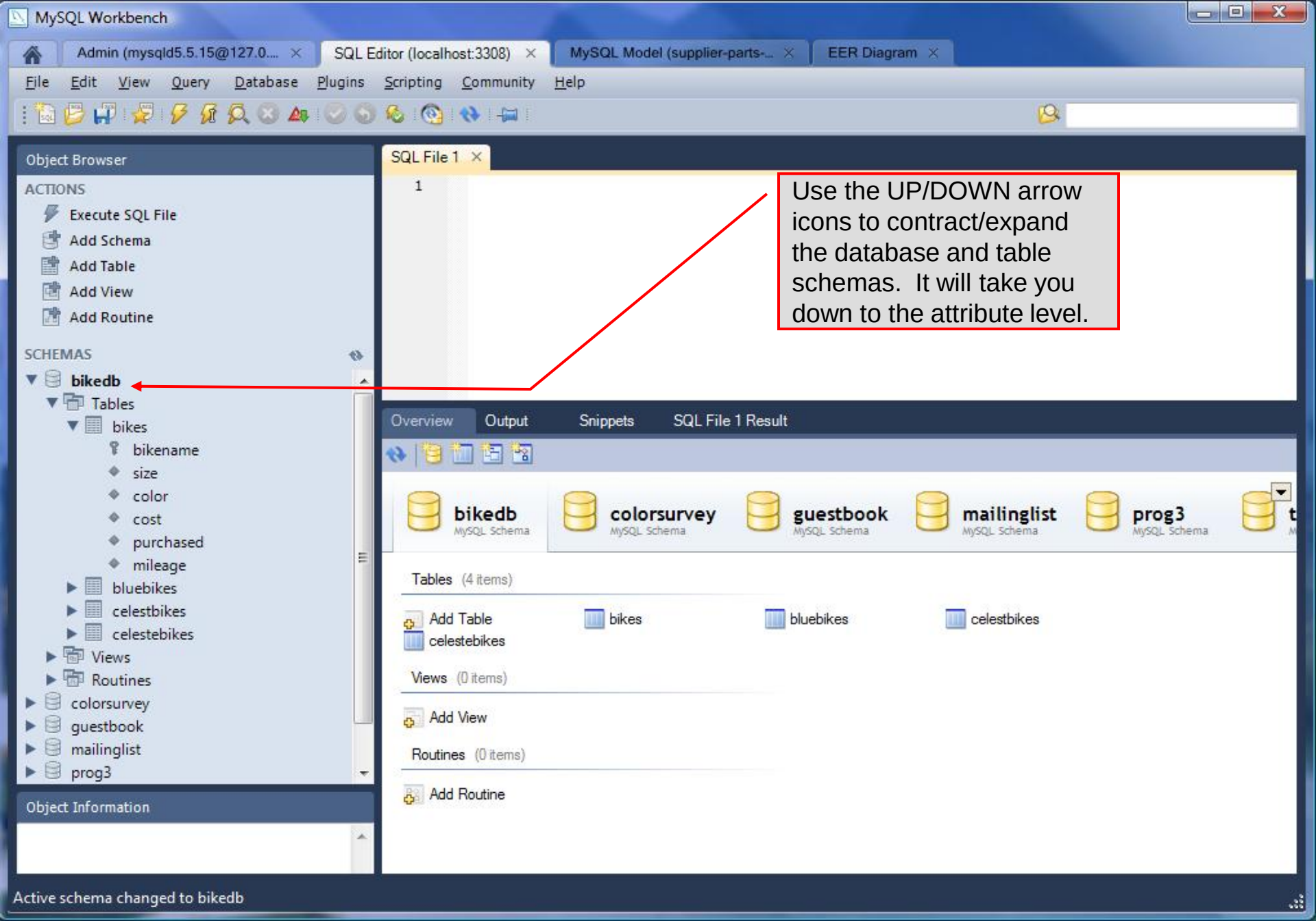
Running MySQL 5.5.15 (cont.)

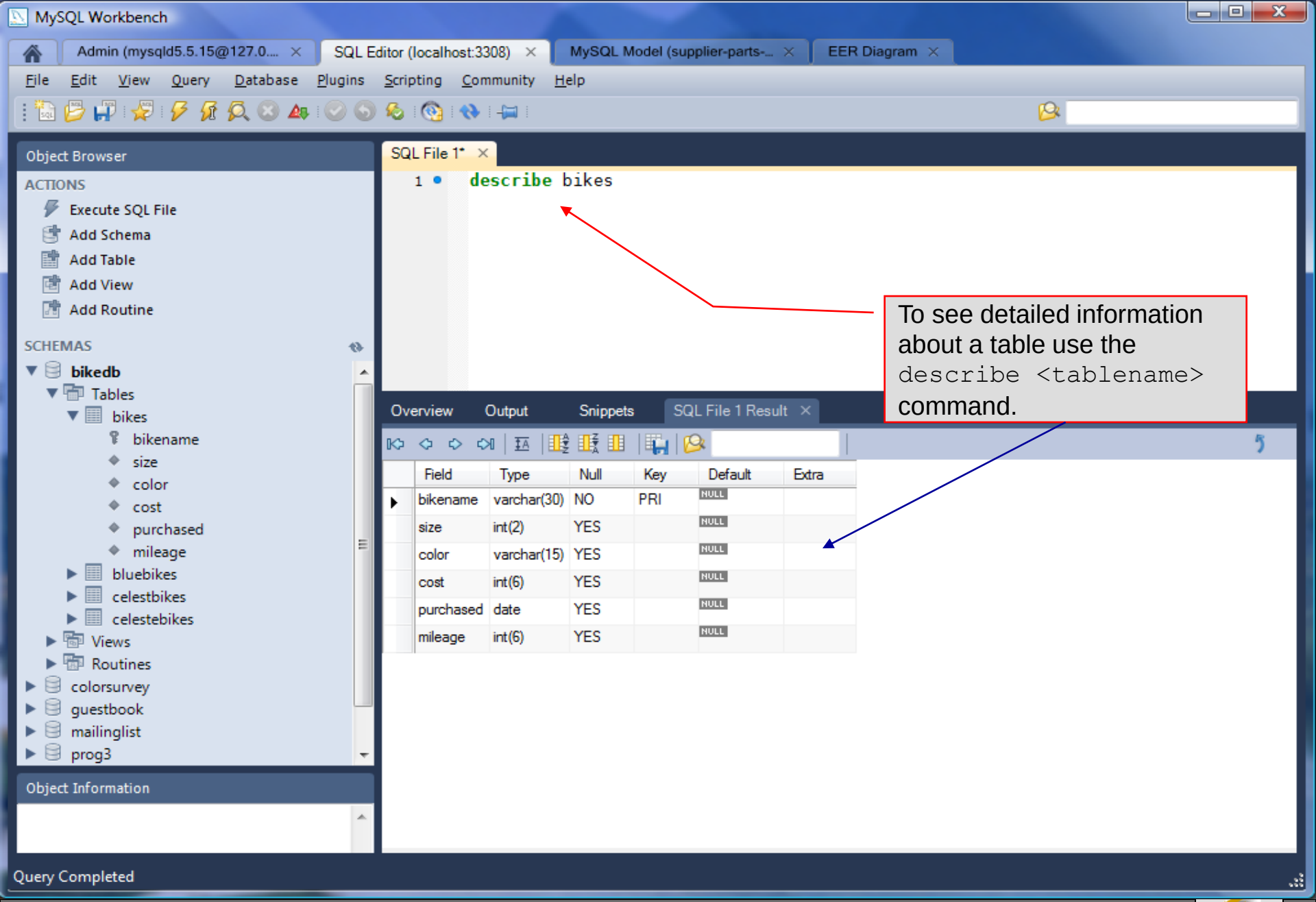


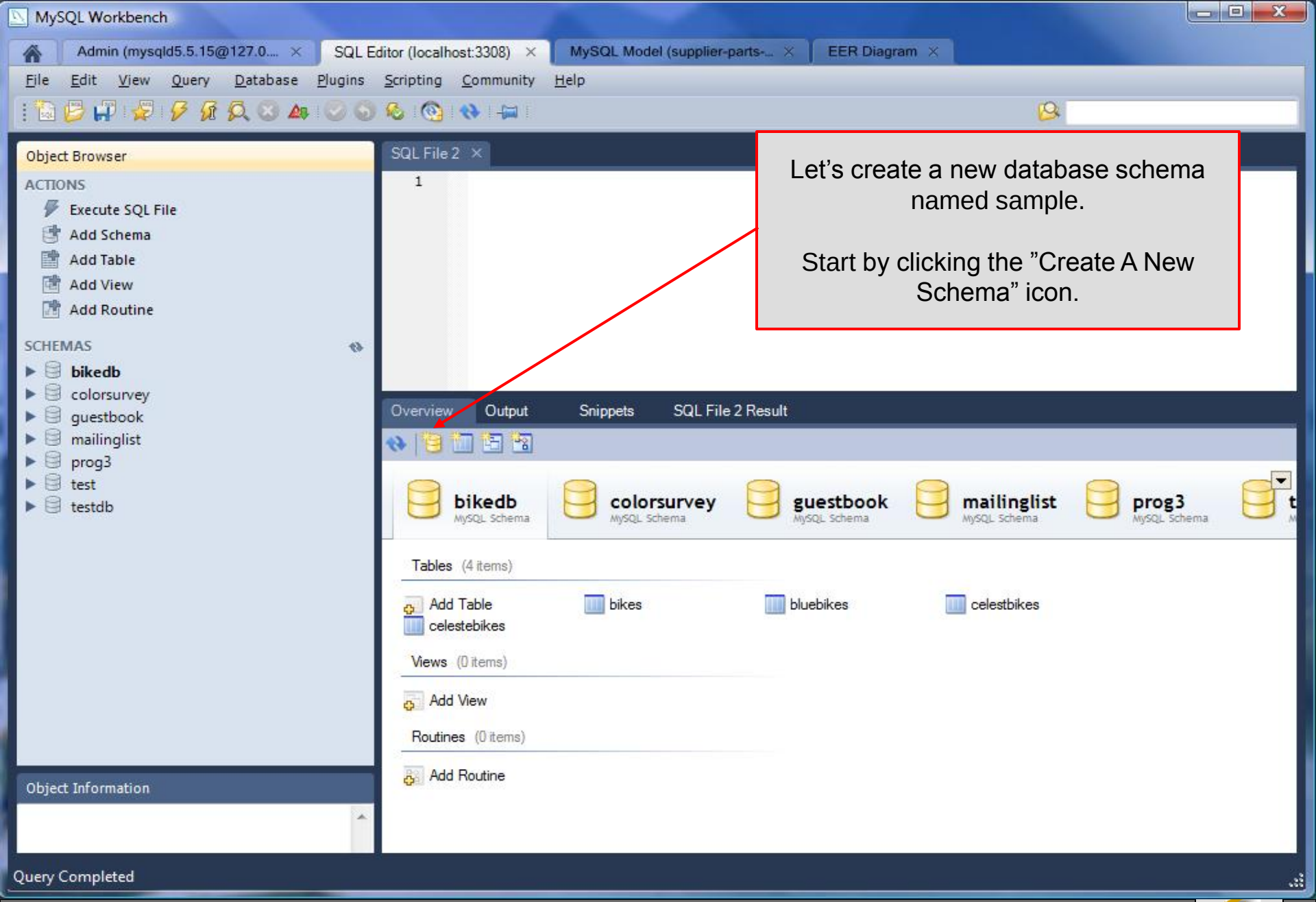
Hopefully, you see this output from MySQL. The MySQL server is now awaiting a command from this client.

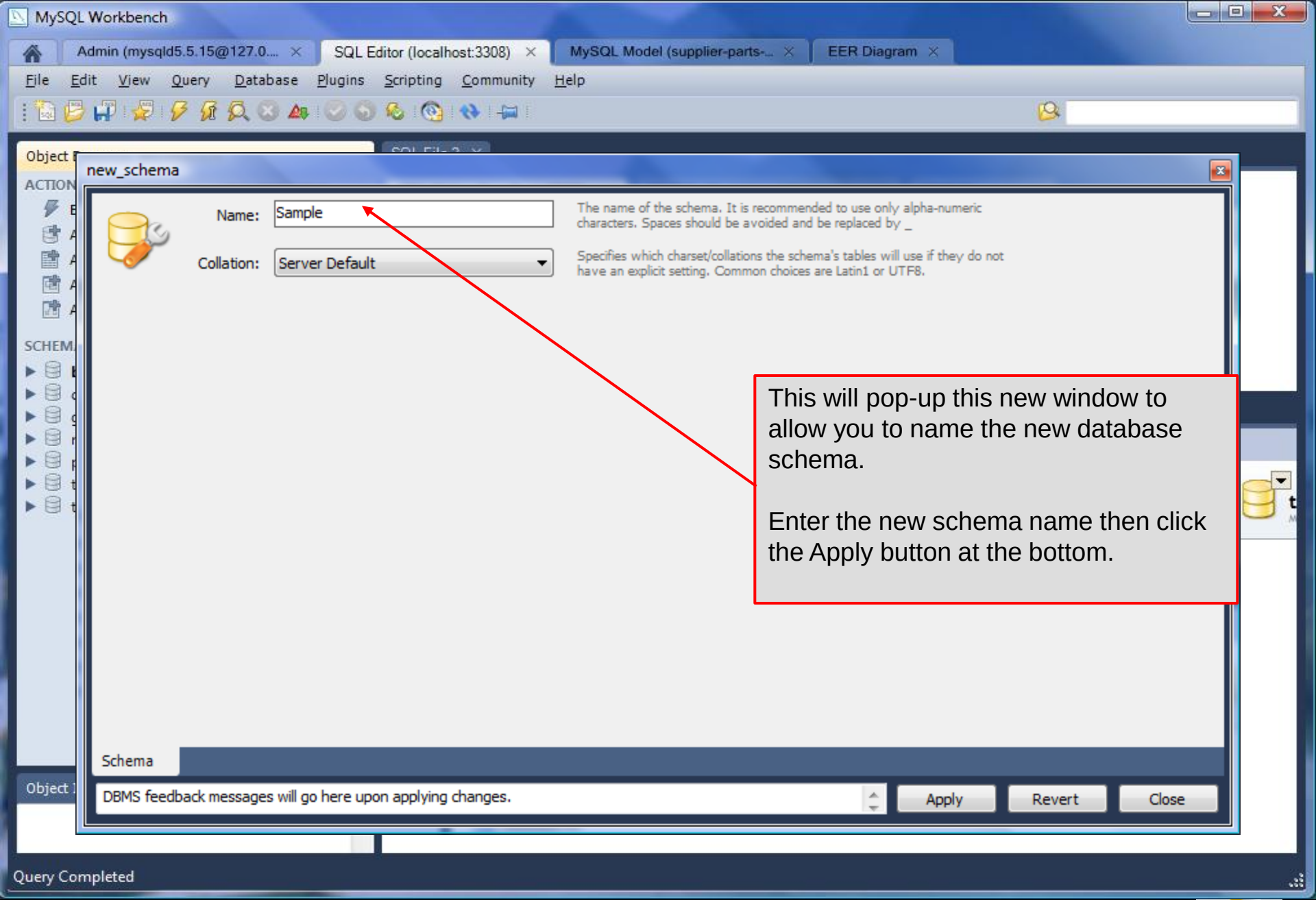

C:\Program Files\MySQL\MySQL Server 5.5\bin\mysql.exe
Connection id: 15
Current database:
Current user: root@localhost
SSL: Not in use
Using delimiter: ;
Server version: 5.5.15 MySQL Community Server (GPL)
Protocol version: 10
Connection: localhost via TCP/IP
Server characterset: latin1
Db characterset: latin1
Client characterset: latin1
Conn. characterset: latin1
TCP port: 3308
Uptime: 32 min 21 sec
Threads: 6 Questions: 917 Slow queries: 0 Opens: 61 Flush tables: 1 Open ta
eries per second avg: 0.472
mysql> show databases;
Database
information_schema
bikedb
colorsurvey
guestbook
mailinglist
mysql
performance_schema
prog3
test
testdb
10 rows in set (0.00
mysql>
List all databases managed by this MySQL server which are accessible to this client.
Note: new installations will contain only 4 databases: information_schema, mysql, performance_schema, and test.

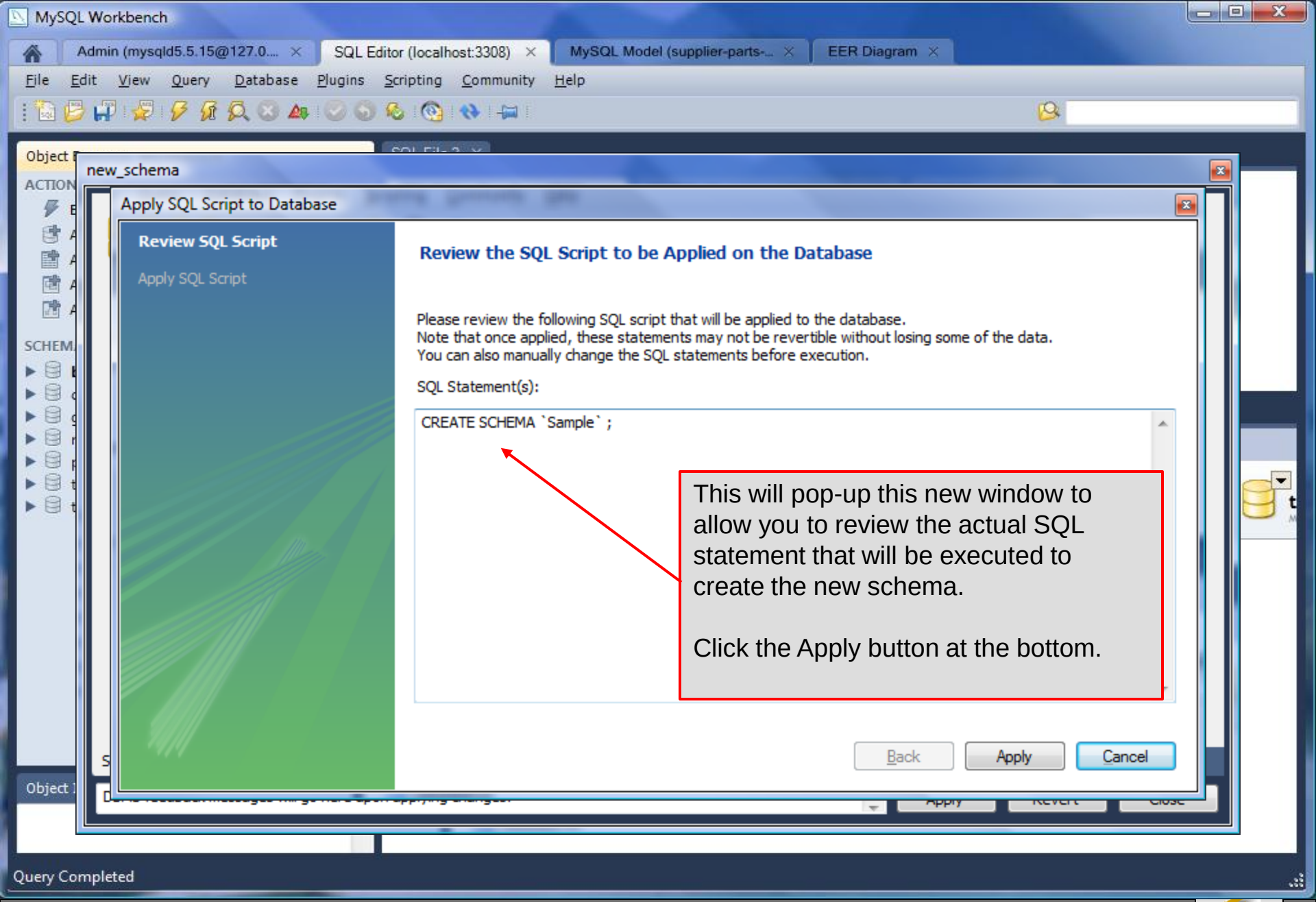

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bikename
size
color
cost
purchased
mileage
bluebikes
celestbikes
celestebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
Object Information
SQL File 1*
1 show databases
List all databases managed by this MySQL server which are accessible to this client.
Overview Output Snippets SQL File 1 Result
Database
information_schema
bikedb
colorsurvey
guestbook
mailinglist
mysql
performance_schema
prog3
test
testdb
Note: new installations will contain only 4 databases: information_schema, mysql, performance_schema, and test.
Query Completed

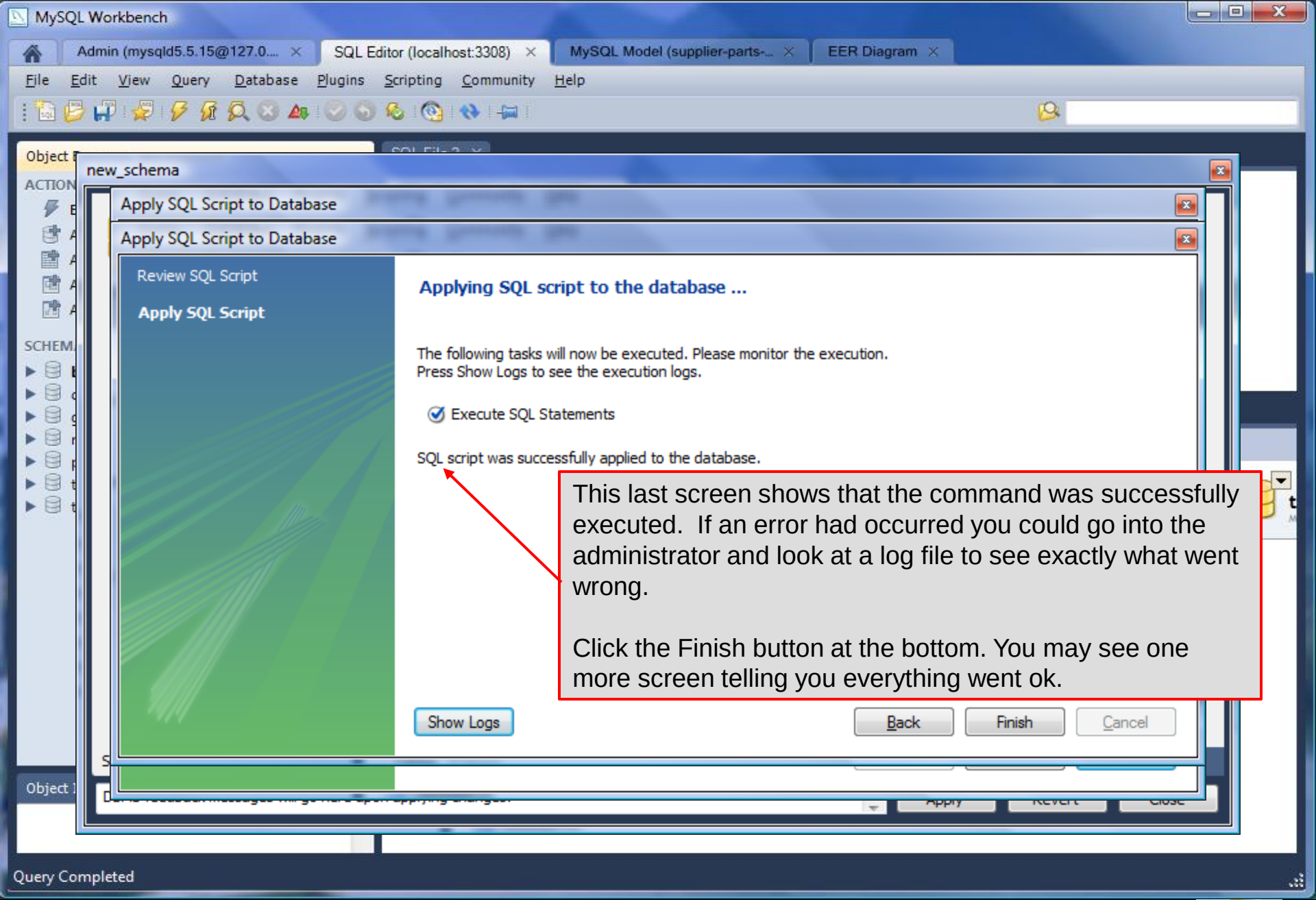

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bikename
size
color
cost
purchased
mileage
bluebikes
celestbikes
celestebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
Object Information
SQL File 1
1
Use the UP/DOWN arrow icons to contract/expand the database and table schemas. It will take you down to the attribute level.
Overview
Output
Snippets
SQL File 1 Result
bikedb MySQL Schema
colorsurvey MySQL Schema
guestbook MySQL Schema
mailinglist MySQL Schema
prog3 MySQL Schema
Tables (4 items)
Add Table
bikes
bluebikes
celestbikes
celestebikes
Views (0 items)
Add View
Routines (0 items)
Add Routine
Active schema changed to bikedb

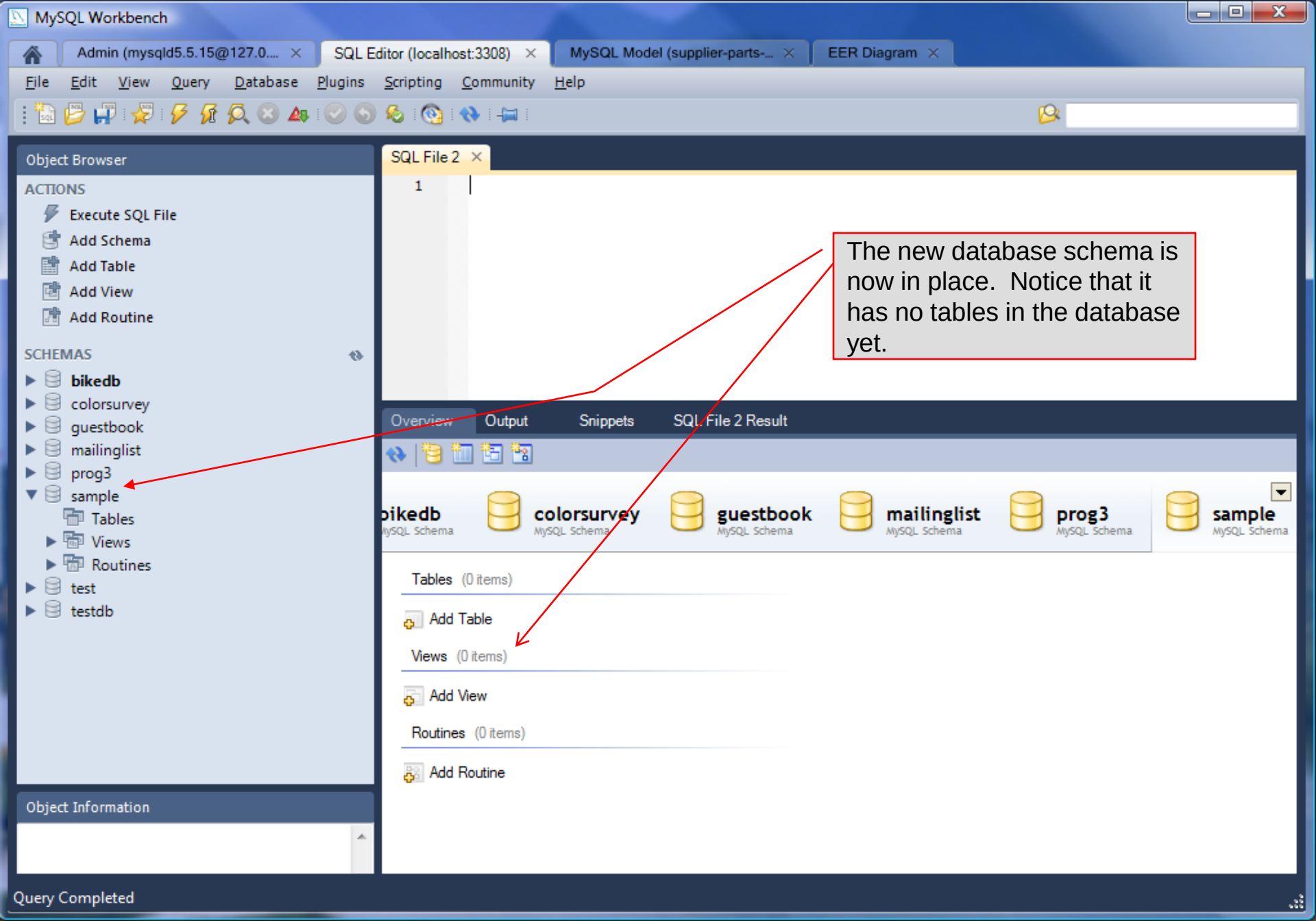

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bikename
size
color
cost
purchased
mileage
bluebikes
celestbikes
celestebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
Object Information
SQL File 1*
1 describe bikes
To see detailed information about a table use the describe <tablename> command.
Overview Output Snippets SQL File 1 Result
Field Type Null Key Default Extra
bikename varchar(30) NO PRI NULL
size int(2) YES NULL
color varchar(15) YES NULL
cost int(6) YES NULL
purchased date YES NULL
mileage int(6) YES NULL
Query Completed

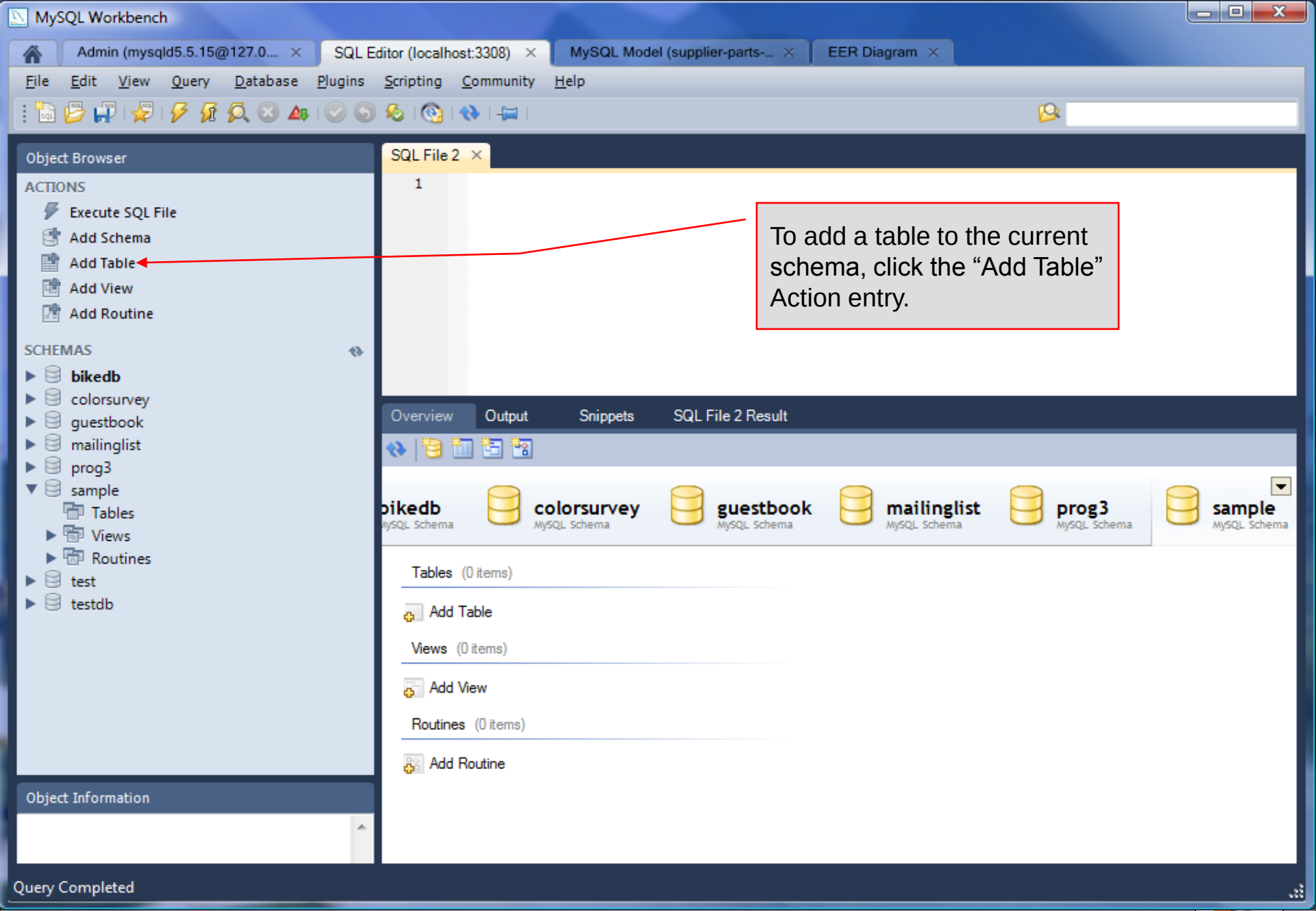

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
test
testdb
Object Information
SQL File 2
1
Let's create a new database schema named sample.
Start by clicking the "Create A New Schema" icon.
Overview
Output
Snippets
SQL File 2 Result
bikedb MySQL Schema
colorsurvey MySQL Schema
guestbook MySQL Schema
mailinglist MySQL Schema
prog3 MySQL Schema
Tables (4 items)
Add Table
bikes
bluebikes
celestbikes
celestebikes
Views (0 items)
Add View
Routines (0 items)
Add Routine
Query Completed

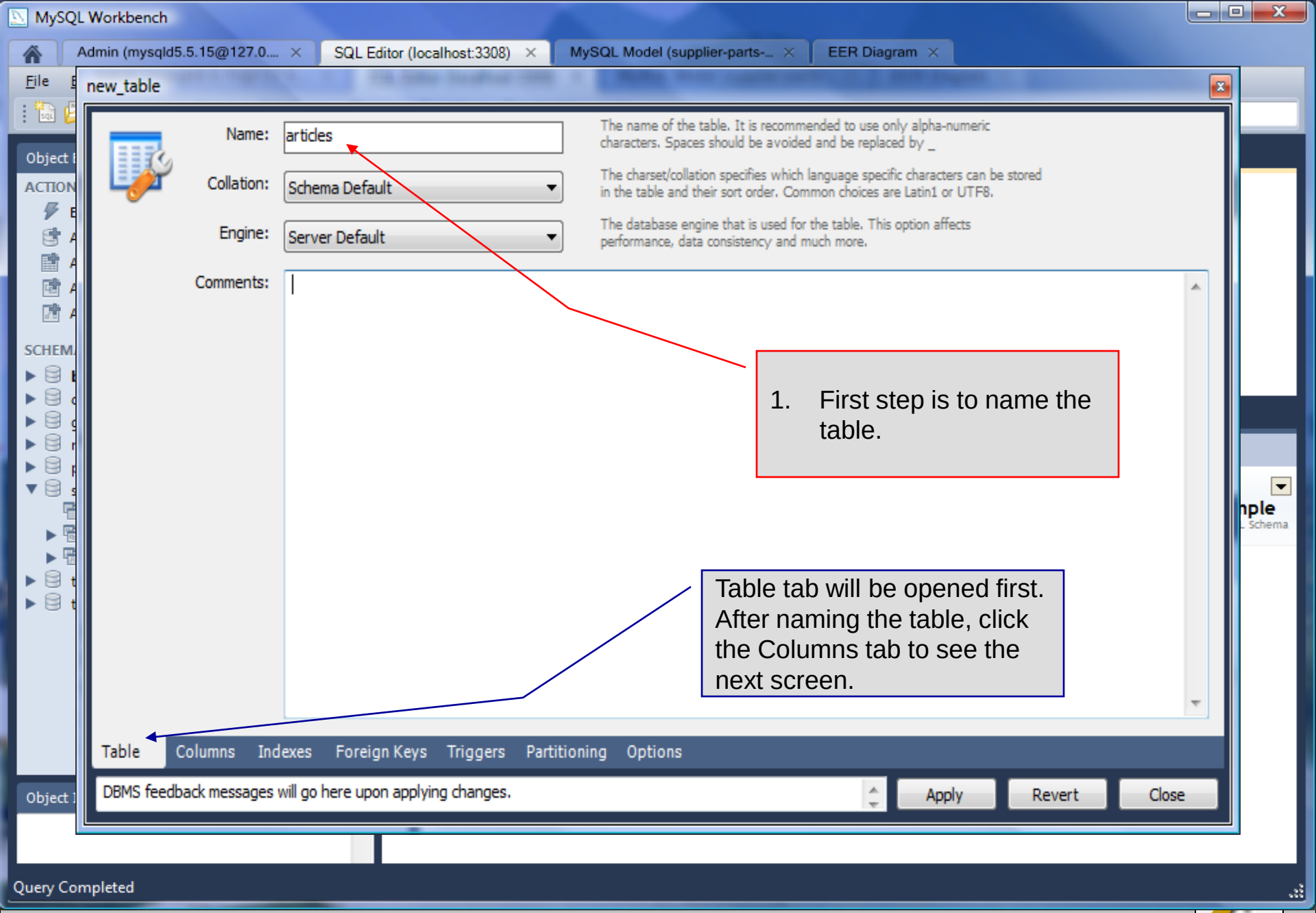

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
new_schema
Name: Sample
The name of the schema. It is recommended to use only alpha-numeric characters. Spaces should be avoided and be replaced by _
Collation: Server Default
Specifies which charset/collations the schema's tables will use if they do not have an explicit setting. Common choices are Latin1 or UTF8.
Schema
DBMS feedback messages will go here upon applying changes.
Apply
Revert
Close
This will pop-up this new window to allow you to name the new database schema.
Enter the new schema name then click the Apply button at the bottom.
Query Completed

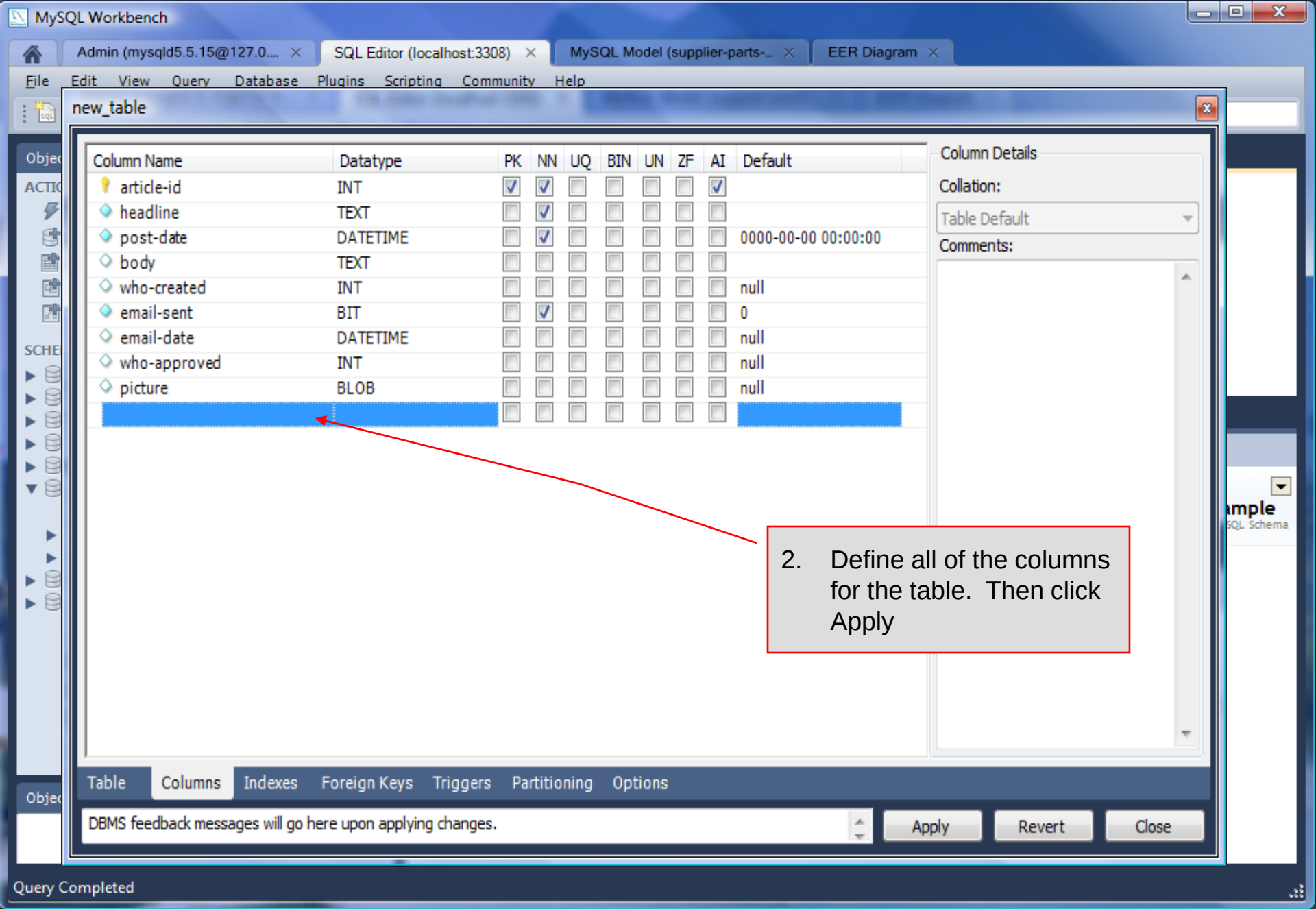

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
new_schema
Apply SQL Script to Database
Review SQL Script
Apply SQL Script
Review the SQL Script to be Applied on the Database
Please review the following SQL script that will be applied to the database.
Note that once applied, these statements may not be revertible without losing some of the data.
You can also manually change the SQL statements before execution.
SQL Statement(s):
CREATE SCHEMA `Sample` ;
This will pop-up this new window to allow you to review the actual SQL statement that will be executed to create the new schema.
Click the Apply button at the bottom.
Back
Apply
Cancel
Query Completed

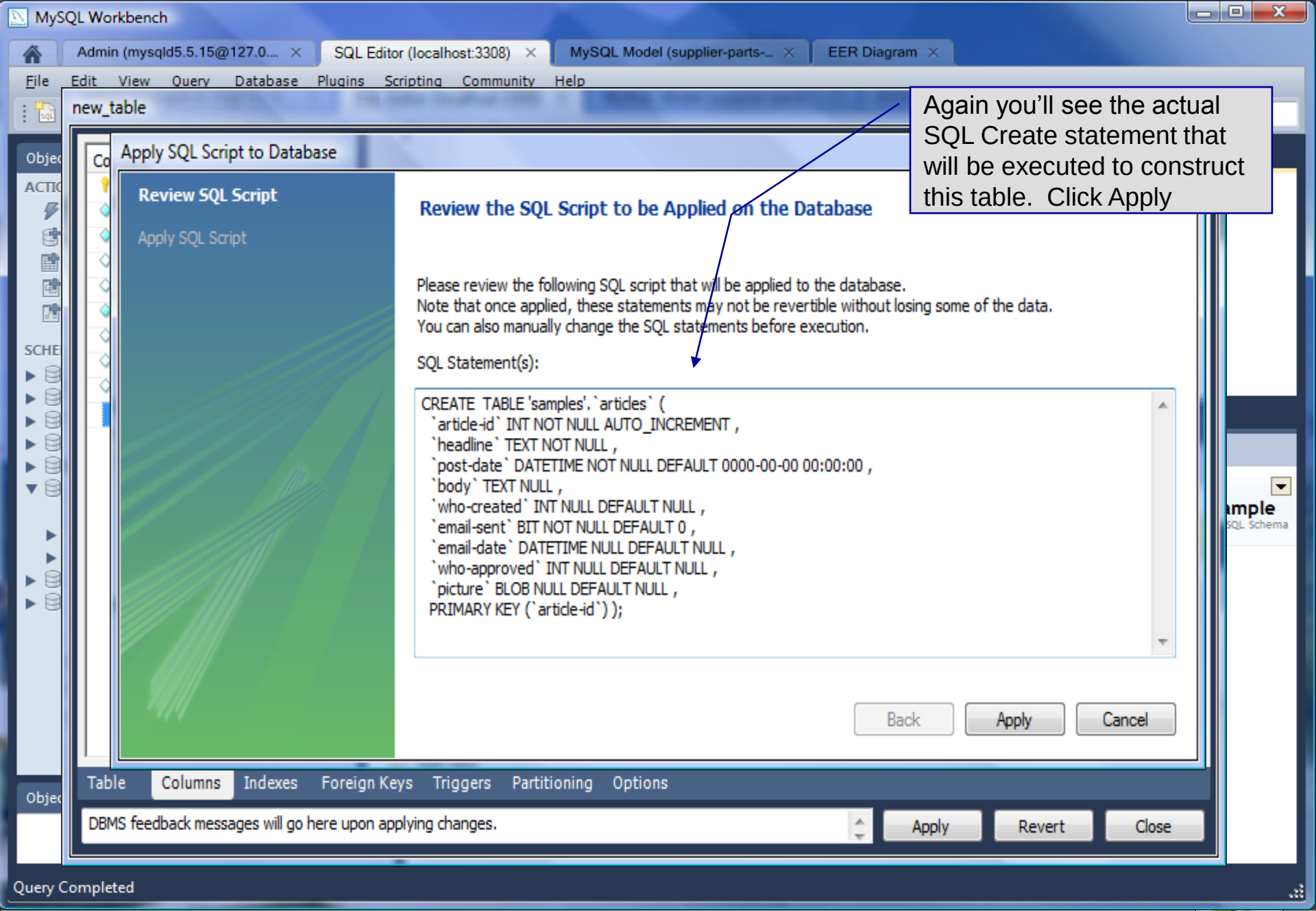

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
new_schema
Apply SQL Script to Database
Apply SQL Script to Database
Review SQL Script
Apply SQL Script
Applying SQL script to the database ...
The following tasks will now be executed. Please monitor the execution.
Press Show Logs to see the execution logs.
Execute SQL Statements
SQL script was successfully applied to the database.
This last screen shows that the command was successfully executed. If an error had occurred you could go into the administrator and look at a log file to see exactly what went wrong.
Click the Finish button at the bottom. You may see one more screen telling you everything went ok.
Show Logs
Back
Finish
Cancel
Query Completed


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
sample
Tables
Views
Routines
test
testdb
Object Information
SQL File 2
1
The new database schema is now in place. Notice that it has no tables in the database yet.
Overview
Output
Snippets
SQL File 2 Result
bikedb MySQL Schema
colorsurvey MySQL Schema
guestbook MySQL Schema
mailinglist MySQL Schema
prog3 MySQL Schema
sample MySQL Schema
Tables (0 items)
Add Table
Views (0 items)
Add View
Routines (0 items)
Add Routine
Query Completed

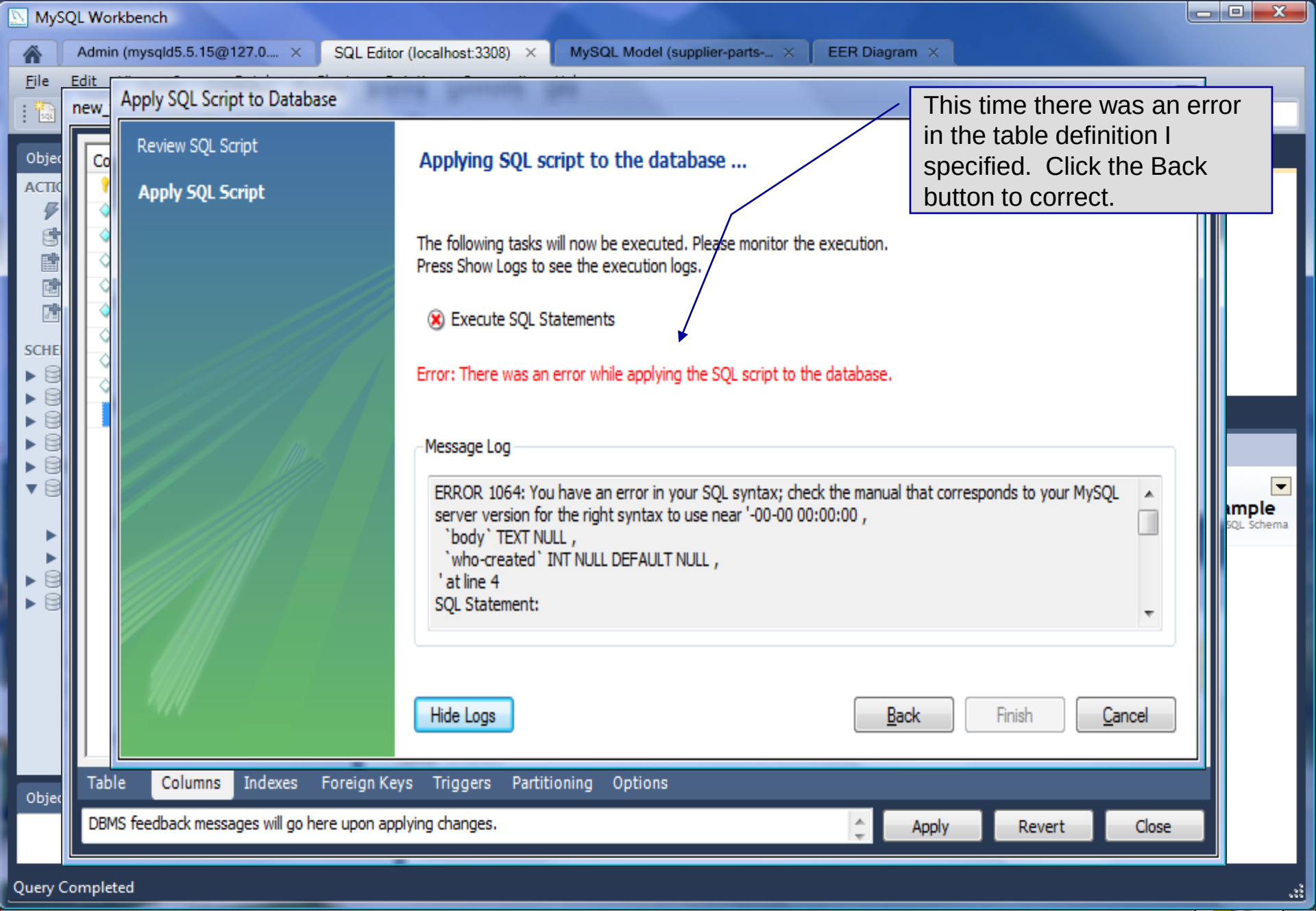

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
sample
Tables
Views
Routines
test
testdb
SQL File 2
1
To add a table to the current schema, click the “Add Table” Action entry.
Overview
Output
Snippets
SQL File 2 Result
colorsurvey MySQL Schema
guestbook MySQL Schema
mailinglist MySQL Schema
prog3 MySQL Schema
sample MySQL Schema
Tables (0 items)
Add Table
Views (0 items)
Add View
Routines (0 items)
Add Routine
Object Information
Query Completed

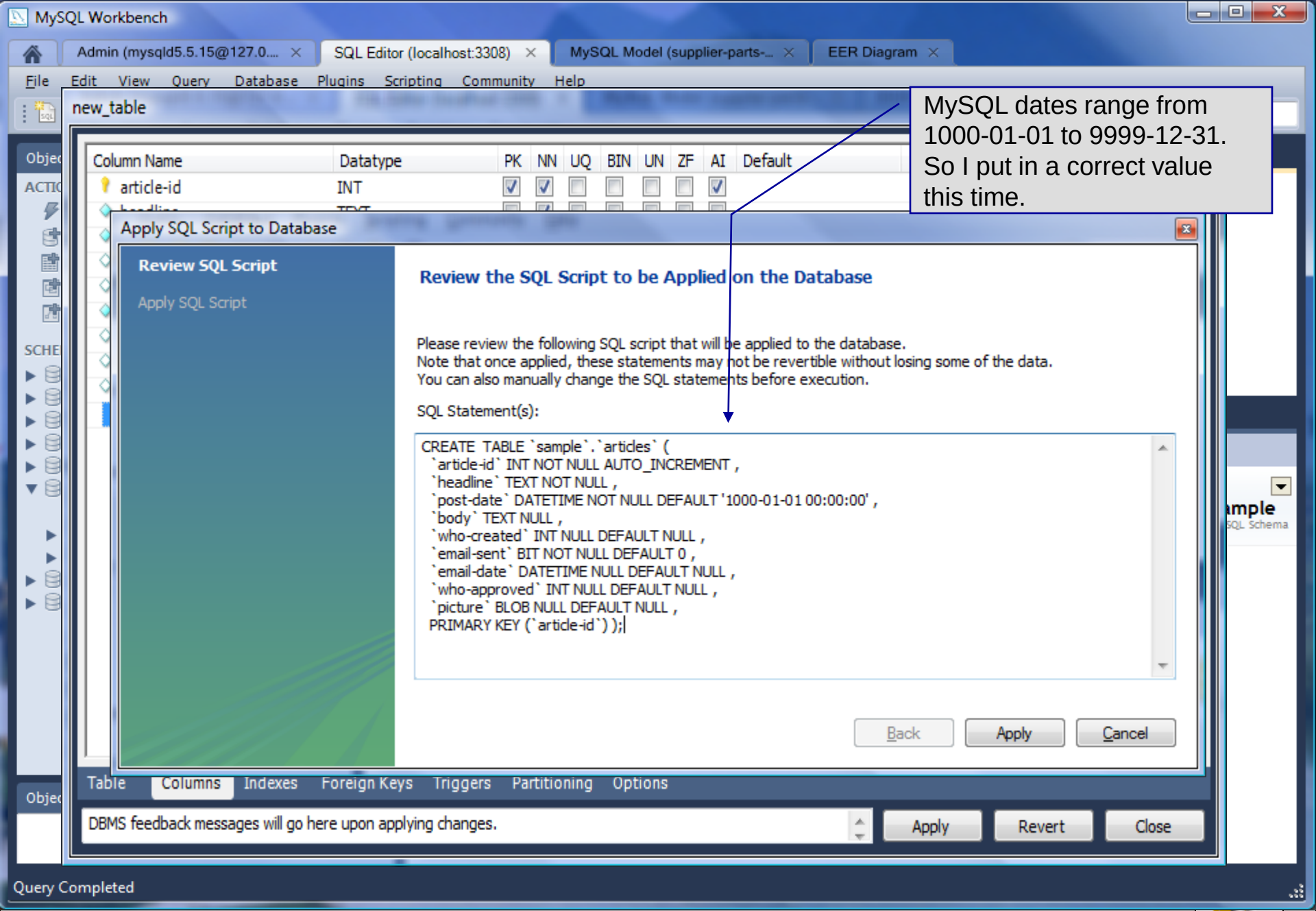

MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File
new_table
Name:
articles
Collation:
Schema Default
Engine:
Server Default
Comments:
The name of the table. It is recommended to use only alpha-numeric characters. Spaces should be avoided and be replaced by _
The charset/collation specifies which language specific characters can be stored in the table and their sort order. Common choices are Latin1 or UTF8.
The database engine that is used for the table. This option affects performance, data consistency and much more.
1. First step is to name the table.
Table tab will be opened first. After naming the table, click the Columns tab to see the next screen.
Table
Columns
Indexes
Foreign Keys
Triggers
Partitioning
Options
DBMS feedback messages will go here upon applying changes.
Apply
Revert
Close
Query Completed


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
new_table
Column Name Datatype PK NN UQ BIN UN ZF AI Default
article-id INT
headline TEXT
post-date DATETIME 0000-00-00 00:00:00
body TEXT
who-created INT null
email-sent BIT 0
email-date DATETIME null
who-approved INT null
picture BLOB null
Column Details
Collation:
Table Default
Comments:
2. Define all of the columns for the table. Then click Apply
Table Columns Indexes Foreign Keys Triggers Partitioning Options
DBMS feedback messages will go here upon applying changes.
Apply
Revert
Close
Query Completed

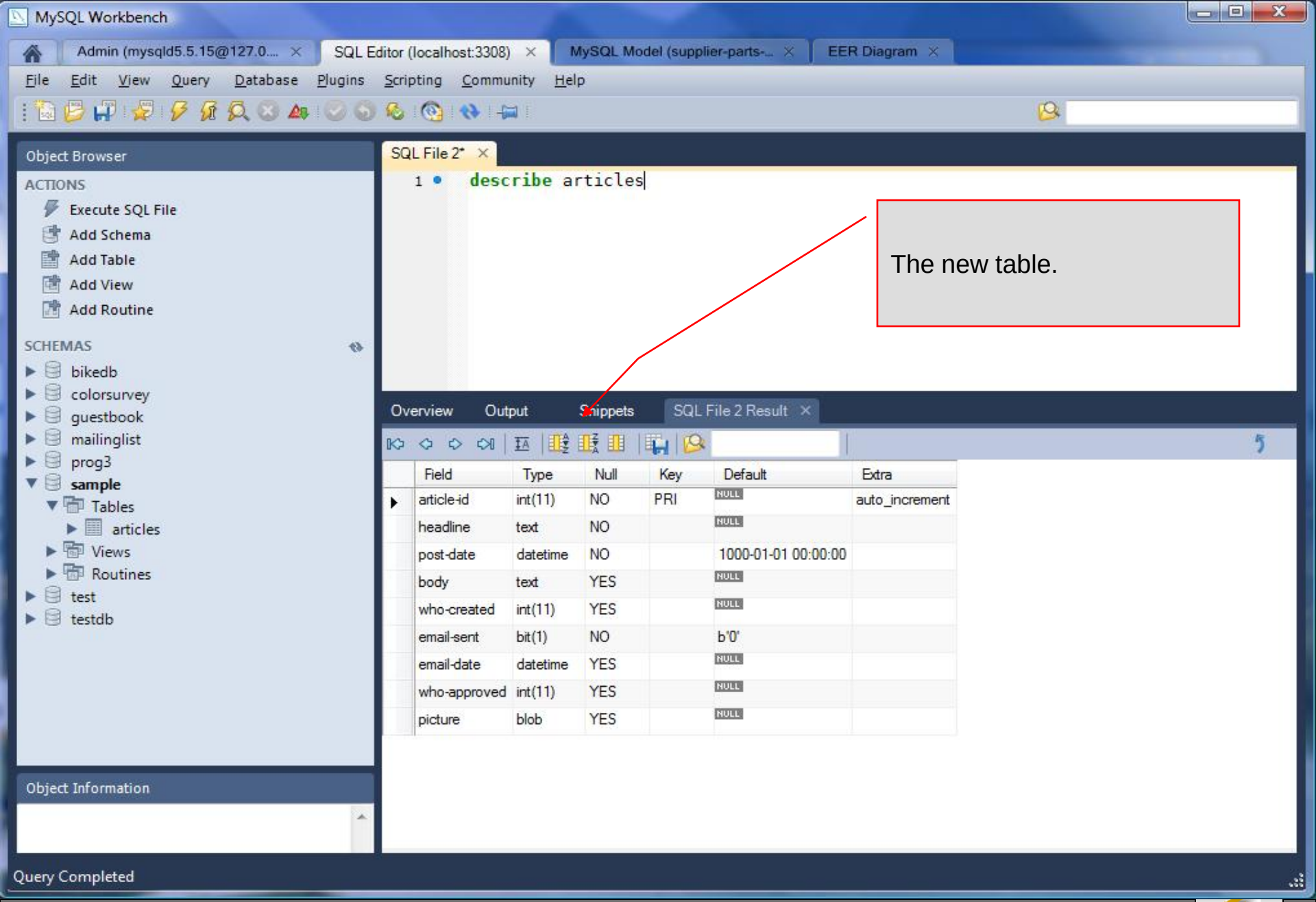


Again you'll see the actual SQL Create statement that will be executed to construct this table. Click Apply


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File
Edit
Apply SQL Script to Database
Review SQL Script
Apply SQL Script
Applying SQL script to the database ...
The following tasks will now be executed. Please monitor the execution.
Press Show Logs to see the execution logs.
Execute SQL Statements
Error: There was an error while applying the SQL script to the database.
Message Log
ERROR 1064: You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version for the right syntax to use near '-00-00 00:00:00 ,
`body` TEXT NULL ,
`who-created` INT NULL DEFAULT NULL ,
' at line 4
SQL Statement:
Hide Logs
Back
Finish
Cancel
This time there was an error in the table definition I specified. Click the Back button to correct.
Table
Columns
Indexes
Foreign Keys
Triggers
Partitioning
Options
DBMS feedback messages will go here upon applying changes.
Apply
Revert
Close
Query Completed



MySQL dates range from 1000-01-01 to 9999-12-31. So I put in a correct value this time.


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
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Add Table
Add View
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
sample
Tables
articles
Views
Routines
test
testdb
Object Information
SQL File 2*
1 describe articles
The new table.
Overview Output Snippets SQL File 2 Result
Field Type Null Key Default Extra
article-id int(11) NO PRI NULL auto_increment
headline text NO NULL
post-date datetime NO 1000-01-01 00:00:00
body text YES NULL
who-created int(11) YES NULL
email-sent bit(1) NO b'0'
email-date datetime YES NULL
who-approved int(11) YES NULL
picture blob YES NULL
Query Completed

Manipulating Tables in MySQL (cont.)

- The `create table` command has the following general format:

```
create [temporary] table
[if not exists] tablename
[(create_definition, ...)]
[table_options] [select_statement];
```

- If the [if not exists] clause is present, MySQL will produce an error message if a table with the specified name already exists in the database, otherwise the table is created.

Manipulating Tables in MySQL (cont.)

- A temporary table exists only for the life of the current database connection. It is automatically destroyed when the connection is closed or dies.
- Two different connections can use the same name for a temporary table without conflicting with one another.
- Temporary tables are most useful when queries get complex and intermediate results become useful. Also, versions of MySQL earlier than version 4.1 do not have subselect capability and temporary tables are a convenient way to simulate subselect query results.

Note: Non-root users require special permission to be able to create temporary tables. These users must have the Create_tmp_tables privilege set in the user grant table. We'll see more on this later.

Creating A Temporary Table From A Select Query

C:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

```
mysql> use bikedb;
Database changed
mysql> select * from bikes;
+-------------------------+------+-------------+------+----------
| bikename                | size | color       | cost | purchased
+-------------------------+------+-------------+------+----------
| Colnago Dream Rabobank  |   60 | blue/orange | 5500 | 2002-07-0
| Bianchi Evolution 3     |   58 | celeste     | 4800 | 2003-11-1
| Eddy Merckx Molteni     |   58 | orange      | 5100 | 2004-08-1
| Eddy Merckx Domo        |   58 | blue/black  | 5300 | 2004-02-0
| Battaglin Carrera       |   60 | red/white   | 4000 | 2001-03-1
| Gianni Motta Personal   |   59 | red/green   | 4400 | 2000-05-0
| Gios Torino Super       |   60 | blue        | 2000 | 1998-11-0
| Schwinn Paramount P14   |   60 | blue        | 1800 | 1992-03-0
| Bianchi Corse Evo 4     |   58 | celeste     | 5700 | 2004-12-0
| Colnago Superissimo     |   59 | red         | 3800 | 1996-03-0
+-------------------------+------+-------------+------+----------
10 rows in set (0.00 sec)

mysql> create temporary table celestebikes
    -> select *
    -> from bikes
    -> where color = "celeste";
Query OK, 2 rows affected (0.00 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> show tables;
+-----------------+
| Tables_in_bikedb |
+-----------------+
| bikes           |
| bluebikes       |
+-----------------+
2 rows in set (0.00 sec)

mysql> select * from celestebikes;
+-------------------+------+---------+------+------------+----
| bikename          | size | color   | cost | purchased  | mi
+-------------------+------+---------+------+------------+----
| Bianchi Evolution 3 |   58 | celeste | 4800 | 2003-11-12 |
| Bianchi Corse Evo 4 |   58 | celeste | 5700 | 2004-12-02 |
+-------------------+------+---------+------+------------+----
2 rows in set (0.00 sec)

mysql>
```

A SELECT query produces a result set which has been extracted from one or more tables. A table can be created with the results of this data using the create table command.

Notice that temporary tables do not appear in a table listing.

Altering A Table

- After a table has been created, it is possible to change the specifications of its schema. This is done through the `alter table` command:

  `alter table` *`table_name action_list`*

  - Note: Changing the schema of a table in a database is not something that is done very often once the database has been created. The time for altering the schema is during the design phase. Altering the schema of an operational database is a very dangerous thing.

- Multiple changes to the table can be made at the same time by separating actions with commas in the `action_list`.

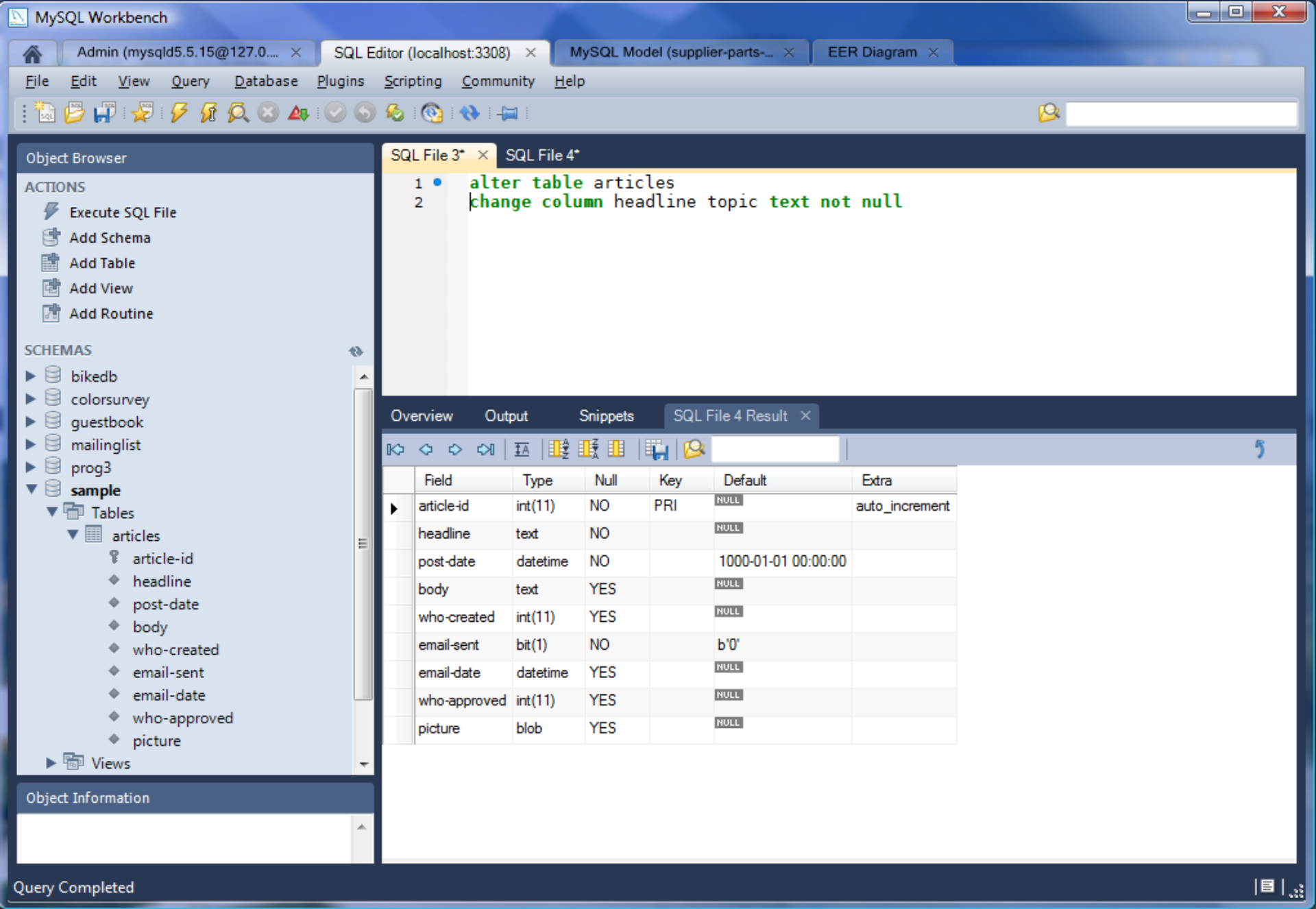
- The possible attribute (column) actions that can be used are shown in the table on the following slide.

Altering A Table (cont.)

Action Syntax	Action Performed
`add [column] column_declaration [first | after column_name]`	Add a column to the table
`alter [column] column_name {set default literal | drop default}`	Specify new default value for a column or remove old default
`change [column] column_name column_declaration`	Modify column declaration with renaming of column
`modify [column] column_declaration`	Modify column declaration without renaming column
`drop [column] column_name`	Drop a column and all data contained within it.
`rename [as] new_table_name`	Rename a table
`table_options`	Change the table options

Actions performed by `alter table` (column related) command

`column_name` represents the current name of the column, `column_declaration` represents the new declaration, in the same format as if it were in a `create` command.


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
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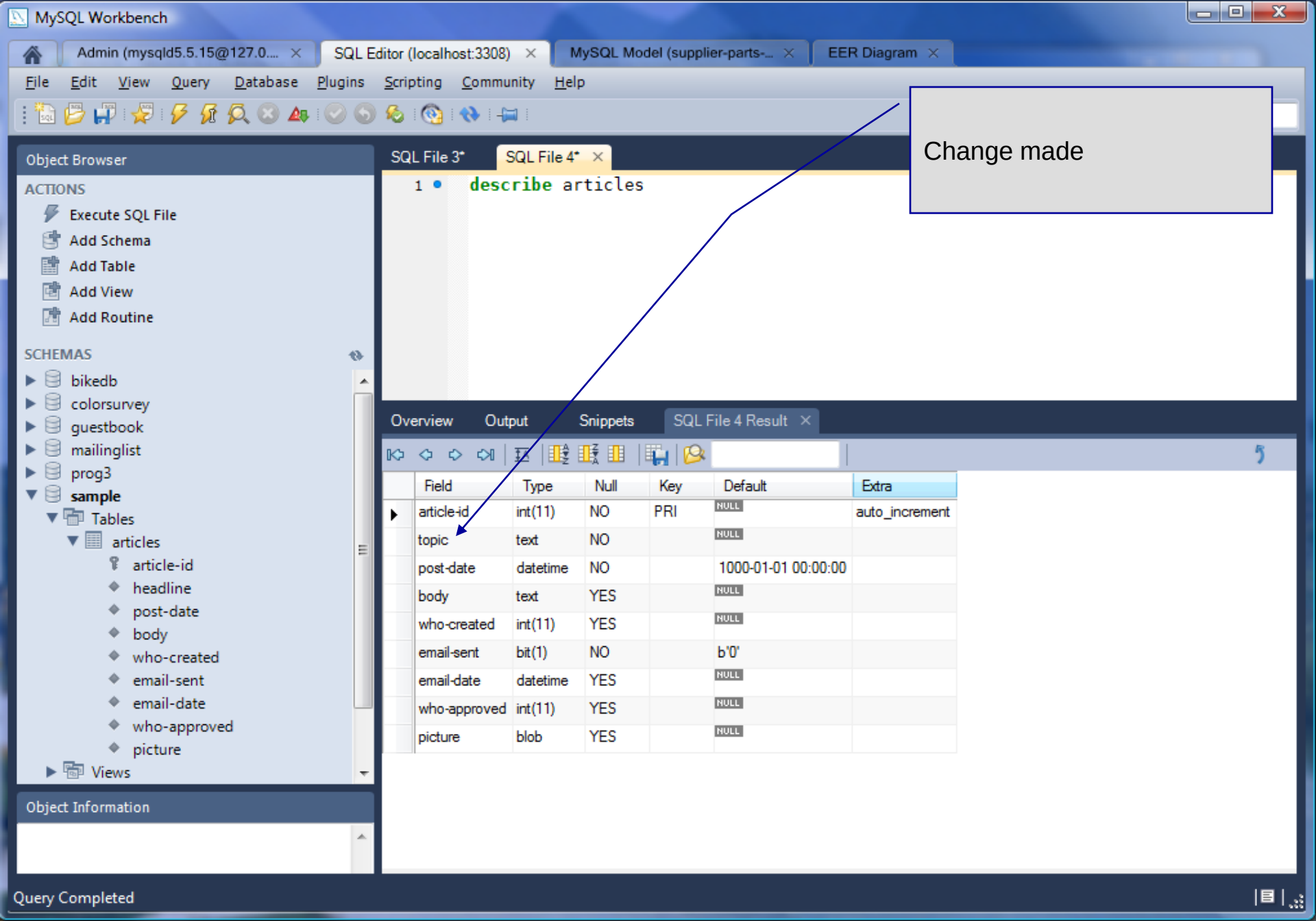
guestbook
mailinglist
prog3
sample
Tables
articles
article-id
headline
post-date
body
who-created
email-sent
email-date
who-approved
picture
Views
Object Information
SQL File 3*
SQL File 4*
1 alter table articles
2 change column headline topic text not null
Overview
Output
Snippets
SQL File 4 Result
Field Type Null Key Default Extra
article-id int(11) NO PRI NULL auto_increment
headline text NO NULL
post-date datetime NO 1000-01-01 00:00:00
body text YES NULL
who-created int(11) YES NULL
email-sent bit(1) NO b'0'
email-date datetime YES NULL
who-approved int(11) YES NULL
picture blob YES NULL
Query Completed


MySQL Workbench
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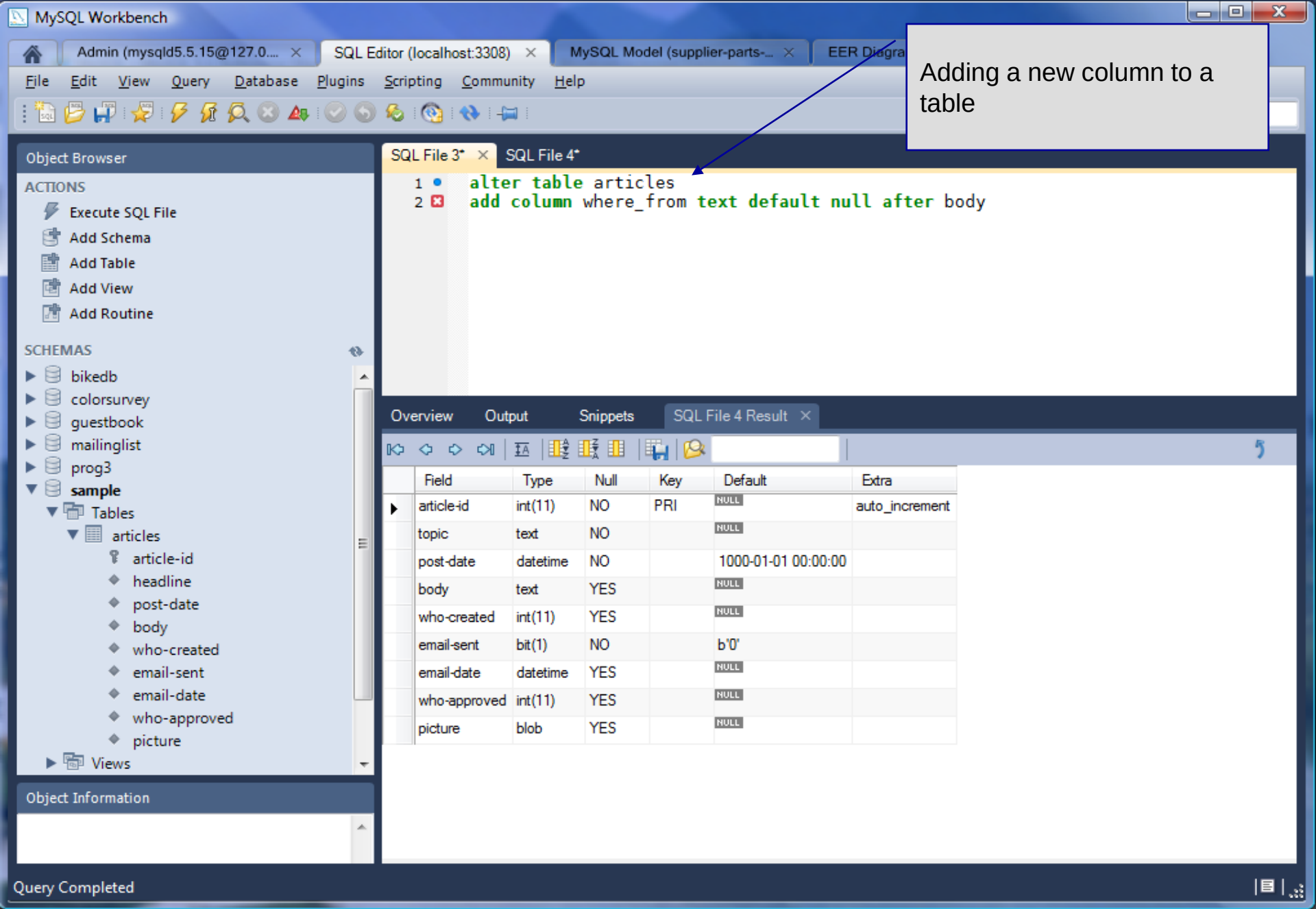
Tables
articles
article-id
headline
post-date
body
who-created
email-sent
email-date
who-approved
picture
Views
Object Information
SQL File 3*
SQL File 4*
1 describe articles
Change made
Overview
Output
Snippets
SQL File 4 Result
Field Type Null Key Default Extra
article-id int(11) NO PRI NULL auto_increment
topic text NO NULL
post-date datetime NO 1000-01-01 00:00:00
body text YES NULL
who-created int(11) YES NULL
email-sent bit(1) NO b'0'
email-date datetime YES NULL
who-approved int(11) YES NULL
picture blob YES NULL
Query Completed


MySQL Workbench
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Adding a new column to a table
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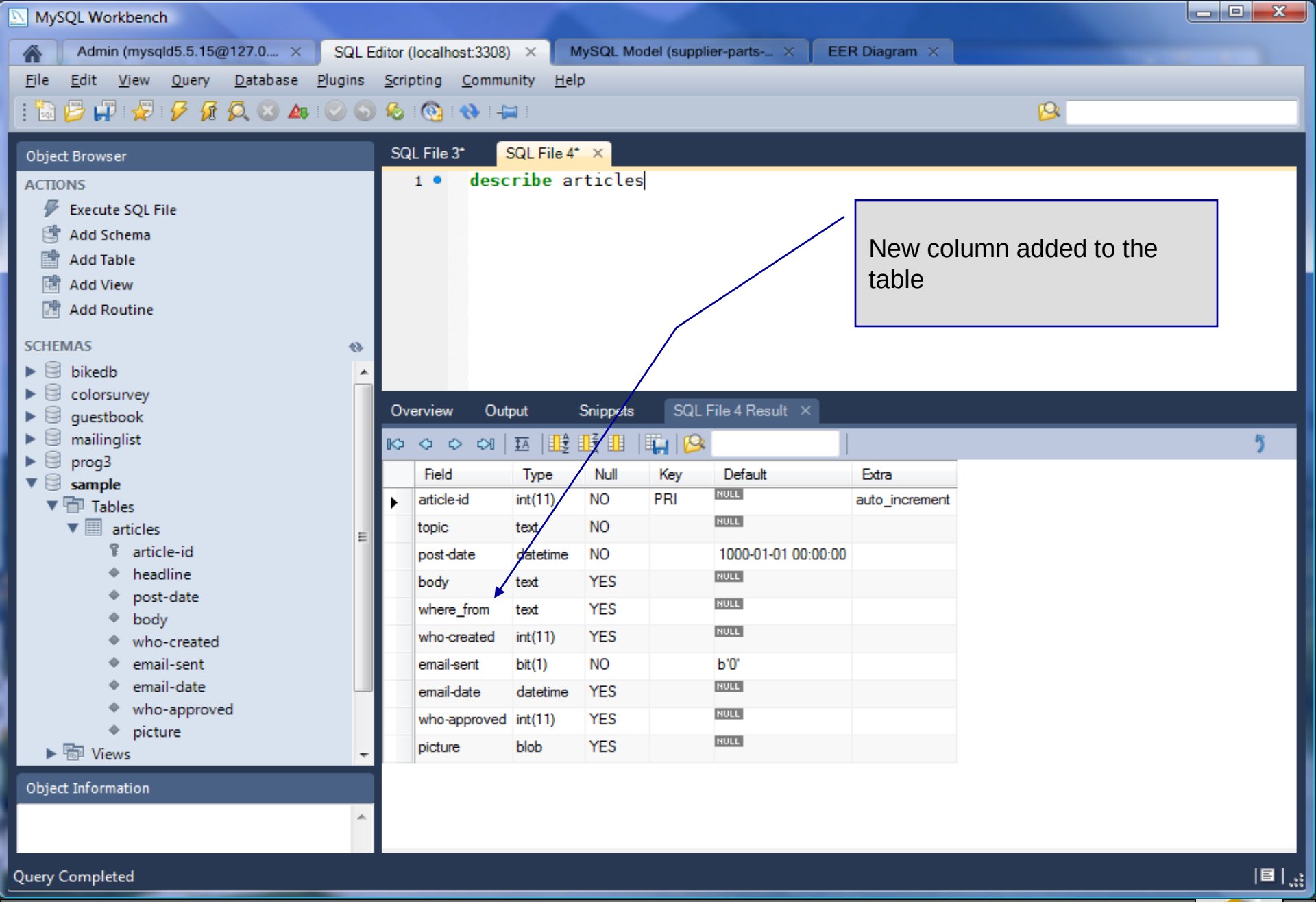
article-id
headline
post-date
body
who-created
email-sent
email-date
who-approved
picture
Views
Object Information
SQL File 3*
SQL File 4*
1 alter table articles
2 add column where_from text default null after body
Overview
Output
Snippets
SQL File 4 Result
Field Type Null Key Default Extra
article-id int(11) NO PRI NULL auto_increment
topic text NO NULL
post-date datetime NO 1000-01-01 00:00:00
body text YES NULL
who-created int(11) YES NULL
email-sent bit(1) NO b'0'
email-date datetime YES NULL
who-approved int(11) YES NULL
picture blob YES NULL
Query Completed


MySQL Workbench
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Tables
articles
article-id
headline
post-date
body
who-created
email-sent
email-date
who-approved
picture
Views
Object Information
SQL File 3*
SQL File 4*
1 describe articles
New column added to the table
Overview
Output
Snippets
SQL File 4 Result
Field Type Null Key Default Extra
article-id int(11) NO PRI NULL auto_increment
topic text NO NULL
post-date datetime NO 1000-01-01 00:00:00
body text YES NULL
where_from text YES NULL
who-created int(11) YES NULL
email-sent bit(1) NO b'0'
email-date datetime YES NULL
who-approved int(11) YES NULL
picture blob YES NULL
Query Completed

Inserting Data Into A Table

- Data can be entered into a MySQL table using either the `insert` or `replace` commands.
- The `insert` statement is the primary way of getting data into the database and has the following form:

Form 1

```
insert [low priority | delayed] [ignore] [into]table_name
        [set] column_name1 = expression1,
                column_name2 = expression2, …
```

Form 2

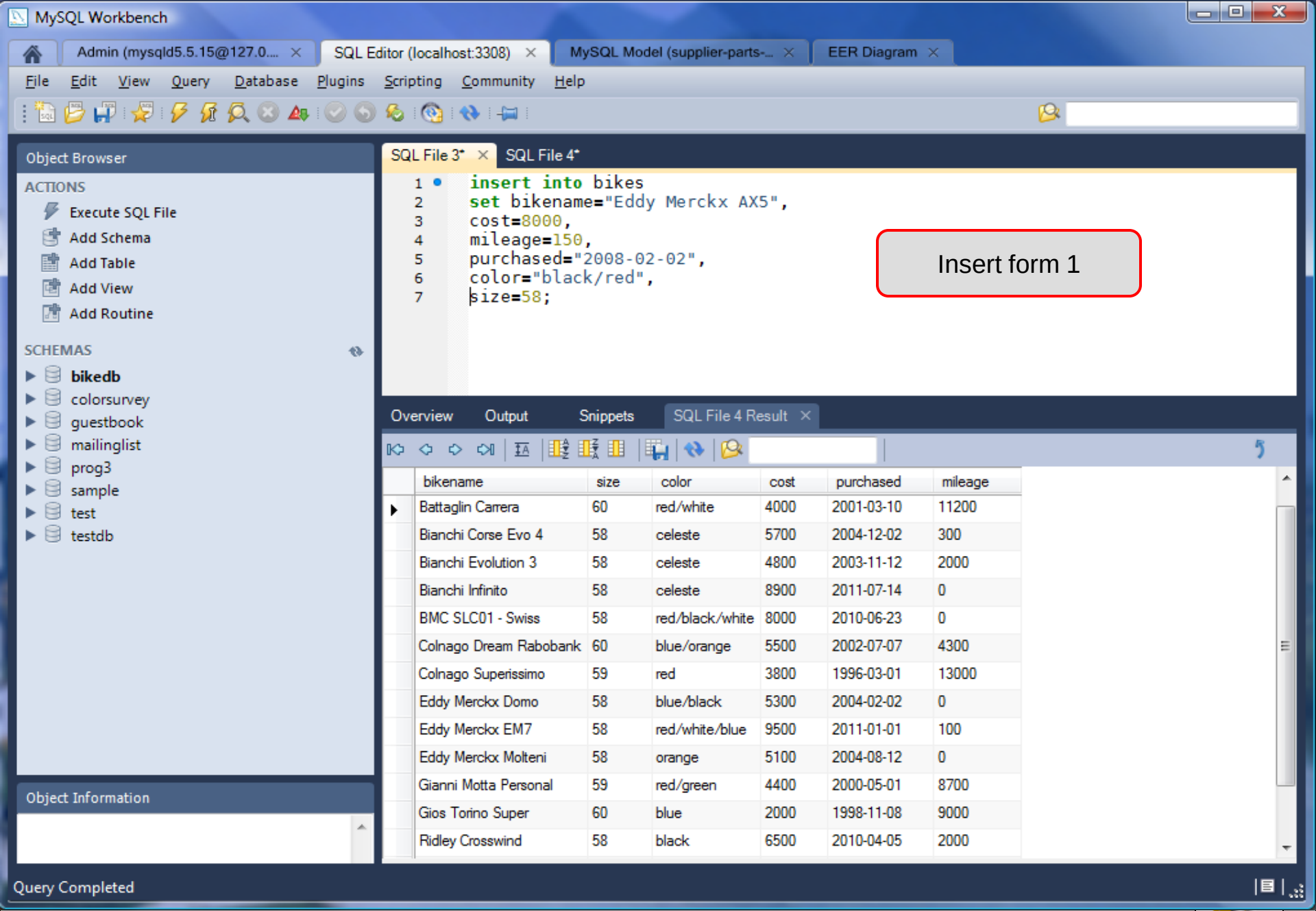
```
insert [low priority | delayed] [ignore] [into]table_name
        [(column_name,…)]values (expression,…), (…)…
```

Form 3

```
insert [low priority | delayed] [ignore] [into]table_name
        [(column_name,…)] select…
```


Inserting Data Into A Table (cont.)

- Form 1 of the insert statement is the most verbose, but also the most common. The `set` clause explicitly names each column and states what value (evaluated from each `expression`) should be put into the table.
- Form 2 (insert values) requires just a comma separated list of the data. For each row inserted, each data value must correspond with a column. In other words, the number of values listed must match the number of columns and the order of the value list must be the same as the columns. (In form 1, the order is not critical since each column is named.)
- Form 3 is used to insert data into a table which is the result set of a `select` statement. This is similar to the temporary table example seen earlier in the notes.
- The following couple of pages give some examples of the different forms of the `insert` command.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Add Routine
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bikedb
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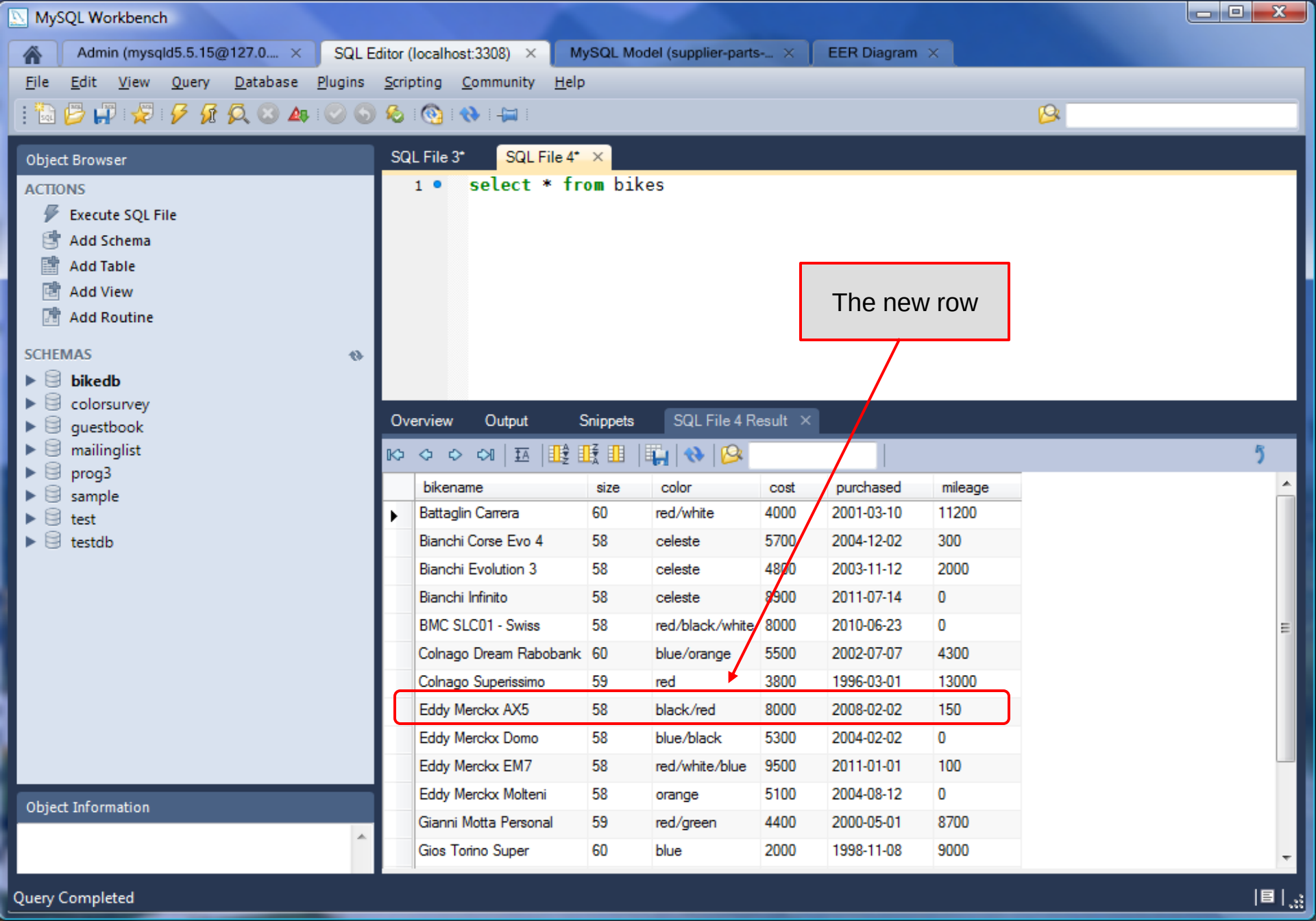
guestbook
mailinglist
prog3
sample
test
testdb
Object Information
SQL File 3*
SQL File 4*
1 insert into bikes
2 set bikename="Eddy Merckx AX5",
3 cost=8000,
4 mileage=150,
5 purchased="2008-02-02",
6 color="black/red",
7 size=58;
Insert form 1
Overview
Output
Snippets
SQL File 4 Result
bikename size color cost purchased mileage
Battaglin Carrera 60 red/white 4000 2001-03-10 11200
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
BMC SLC01 - Swiss 58 red/black/white 8000 2010-06-23 0
Colnago Dream Rabobank 60 blue/orange 5500 2002-07-07 4300
Colnago Superissimo 59 red 3800 1996-03-01 13000
Eddy Merckx Domo 58 blue/black 5300 2004-02-02 0
Eddy Merckx EM7 58 red/white/blue 9500 2011-01-01 100
Eddy Merckx Molteni 58 orange 5100 2004-08-12 0
Gianni Motta Personal 59 red/green 4400 2000-05-01 8700
Gios Torino Super 60 blue 2000 1998-11-08 9000
Ridley Crosswind 58 black 6500 2010-04-05 2000
Query Completed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colorsurvey
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mailinglist
prog3
sample
test
testdb
Object Information
SQL File 3*
SQL File 4*
1 select * from bikes
The new row
Overview Output Snippets SQL File 4 Result
bikename size color cost purchased mileage
Battaglin Carrera 60 red/white 4000 2001-03-10 11200
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
BMC SLC01 - Swiss 58 red/black/white 8000 2010-06-23 0
Colnago Dream Rabobank 60 blue/orange 5500 2002-07-07 4300
Colnago Superissimo 59 red 3800 1996-03-01 13000
Eddy Merckx AX5 58 black/red 8000 2008-02-02 150
Eddy Merckx Domo 58 blue/black 5300 2004-02-02 0
Eddy Merckx EM7 58 red/white/blue 9500 2011-01-01 100
Eddy Merckx Molteni 58 orange 5100 2004-08-12 0
Gianni Motta Personal 59 red/green 4400 2000-05-01 8700
Gios Torino Super 60 blue 2000 1998-11-08 9000
Query Completed

Examples: Inserting Data Into A Table

C:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

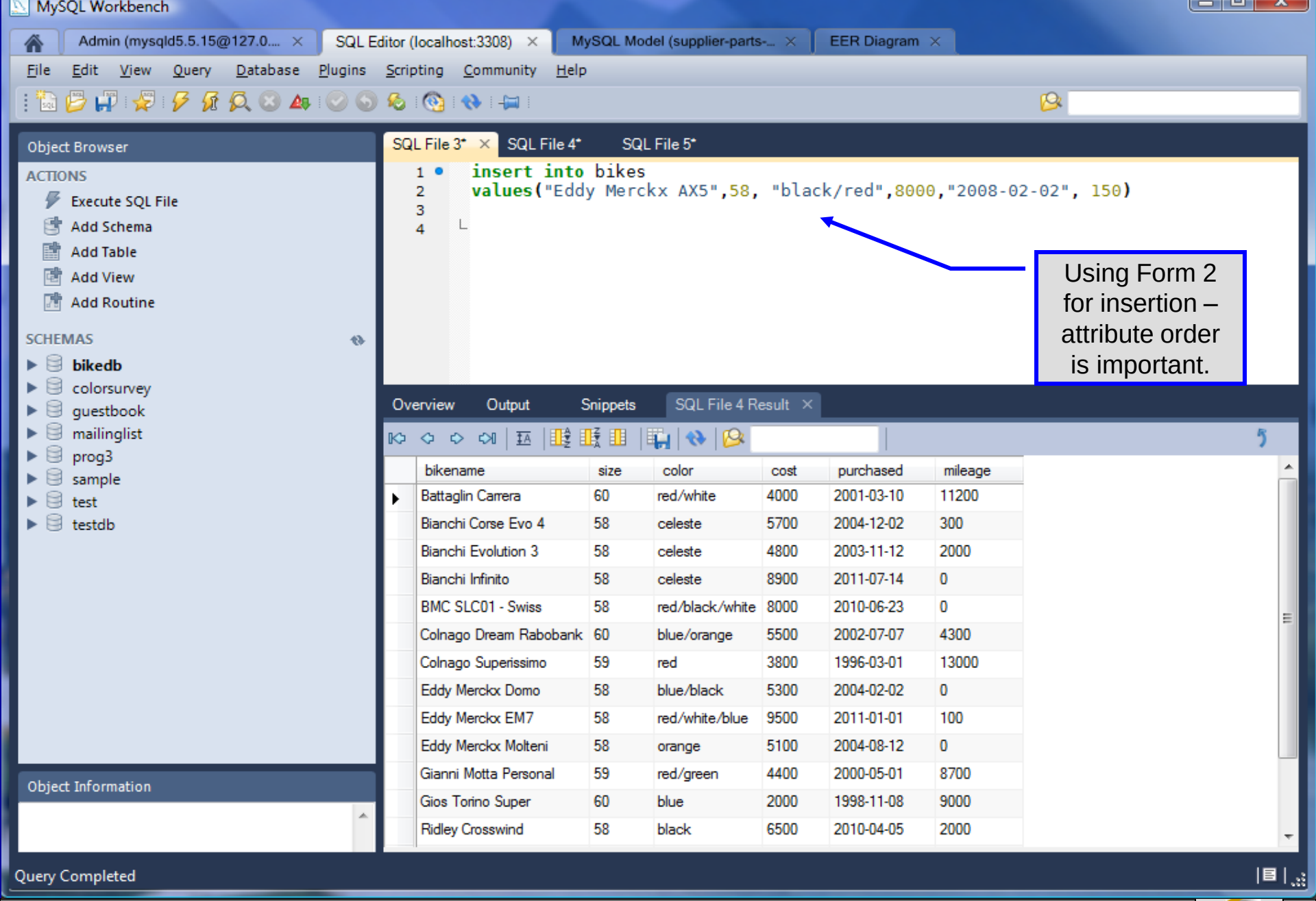
```
mysql>
mysql> select * from bikes;
+-------------------------+------+-------------+------+------------+---
| bikename                | size | color       | cost | purchased  | mi
+-------------------------+------+-------------+------+------------+---
| Colnago Dream Rabobank  |   60 | blue/orange | 5500 | 2002-07-07 |
| Bianchi Evolution 3     |   58 | celeste     | 4800 | 2003-11-12 |
| Eddy Merckx Molteni     |   58 | orange      | 5100 | 2004-08-12 |
| Eddy Merckx Domo        |   58 | blue/black  | 5300 | 2004-02-02 |
| Battaglin Carrera       |   60 | red/white   | 4000 | 2001-03-10 |
| Gianni Motta Personal   |   59 | red/green   | 4400 | 2000-05-01 |
| Gios Torino Super       |   60 | blue        | 2000 | 1998-11-08 |
| Schwinn Paramount P14   |   60 | blue        | 1800 | 1992-03-01 |
| Bianchi Corse Evo 4     |   58 | celeste     | 5700 | 2004-12-02 |
| Colnago Superissimo     |   59 | red         | 3800 | 1996-03-01 |  13000 |
| Ridley Damocles         |   58 | blue/black  | 7500 | 2008-06-27 |      0 |
+-------------------------+------+-------------+------+------------+--------+
11 rows in set (0.00 sec)

mysql> insert into bikes
    -> set bikename="Eddy Merckx AX5",
    -> cost=8000,
    -> mileage=150,
    -> purchased="2008-02-02",
    -> color="black/red",
    -> size=58;
Query OK, 1 row affected (0.00 sec)

mysql> select * from bikes;
+-------------------------+------+-------------+------+------------+------
| bikename                | size | color       | cost | purchased  | mile
+-------------------------+------+-------------+------+------------+------
| Colnago Dream Rabobank  |   60 | blue/orange | 5500 | 2002-07-07 |  4300 |
| Bianchi Evolution 3     |   58 | celeste     | 4800 | 2003-11-12 |  2000 |
| Eddy Merckx Molteni     |   58 | orange      | 5100 | 2004-08-12 |     0 |
| Eddy Merckx Domo        |   58 | blue/black  | 5300 | 2004-02-02 |     0 |
| Battaglin Carrera       |   60 | red/white   | 4000 | 2001-03-10 | 11200 |
| Gianni Motta Personal   |   59 | red/green   | 4400 | 2000-05-01 |  8700 |
| Gios Torino Super       |   60 | blue        | 2000 | 1998-11-08 |  9000 |
| Schwinn Paramount P14   |   60 | blue        | 1800 | 1992-03-01 |   200 |
| Bianchi Corse Evo 4     |   58 | celeste     | 5700 | 2004-12-02 |   300 |
| Colnago Superissimo     |   59 | red         | 3800 | 1996-03-01 | 13000 |
| Ridley Damocles         |   58 | blue/black  | 7500 | 2008-06-27 |     0 |
| Eddy Merckx AX5         |   58 | black/red   | 8000 | 2008-02-02 |   150 |
+-------------------------+------+-------------+------+------------+------+
12 rows in set (0.00 sec)

mysql> _
```

Using Form 1 for insertion – attribute order is not important.


MySQL Workbench
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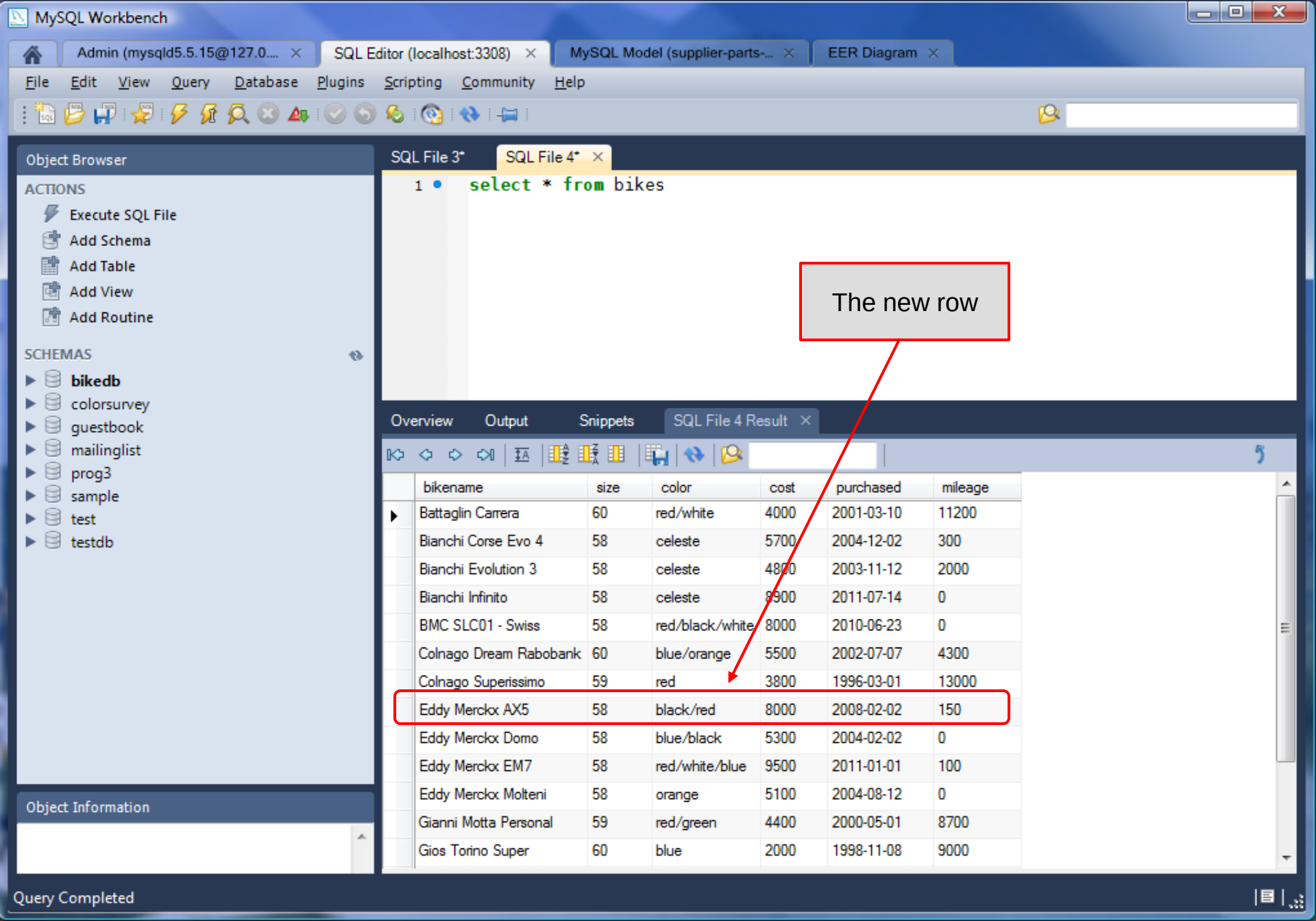
Add Routine
SCHEMAS
bikedb
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
Object Information
SQL File 3*
SQL File 4*
SQL File 5*
1 insert into bikes
2 values("Eddy Merckx AX5",58, "black/red",8000,"2008-02-02", 150)
3
4
Using Form 2 for insertion – attribute order is important.
Overview
Output
Snippets
SQL File 4 Result
bikename size color cost purchased mileage
Battaglin Carrera 60 red/white 4000 2001-03-10 11200
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
BMC SLC01 - Swiss 58 red/black/white 8000 2010-06-23 0
Colnago Dream Rabobank 60 blue/orange 5500 2002-07-07 4300
Colnago Superissimo 59 red 3800 1996-03-01 13000
Eddy Merckx Domo 58 blue/black 5300 2004-02-02 0
Eddy Merckx EM7 58 red/white/blue 9500 2011-01-01 100
Eddy Merckx Molteni 58 orange 5100 2004-08-12 0
Gianni Motta Personal 59 red/green 4400 2000-05-01 8700
Gios Torino Super 60 blue 2000 1998-11-08 9000
Ridley Crosswind 58 black 6500 2010-04-05 2000
Query Completed


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
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Add Schema
Add Table
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SCHEMAS
bikedb
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prog3
sample
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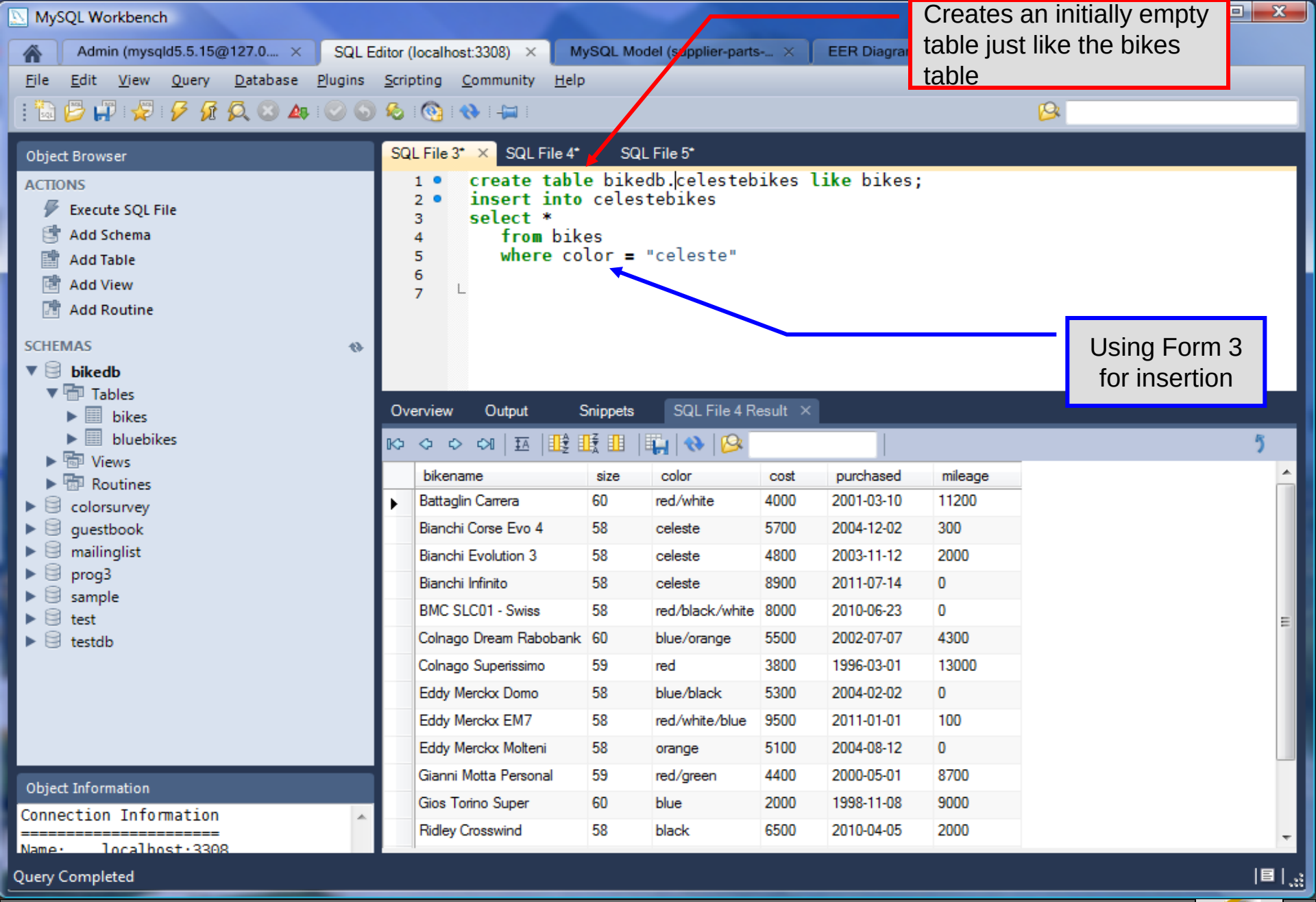
testdb
Object Information
SQL File 3*
SQL File 4*
1 select * from bikes
The new row
Overview Output Snippets SQL File 4 Result
bikename size color cost purchased mileage
Battaglin Carrera 60 red/white 4000 2001-03-10 11200
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
BMC SLC01 - Swiss 58 red/black/white 8000 2010-06-23 0
Colnago Dream Rabobank 60 blue/orange 5500 2002-07-07 4300
Colnago Superissimo 59 red 3800 1996-03-01 13000
Eddy Merckx AX5 58 black/red 8000 2008-02-02 150
Eddy Merckx Domo 58 blue/black 5300 2004-02-02 0
Eddy Merckx EM7 58 red/white/blue 9500 2011-01-01 100
Eddy Merckx Molteni 58 orange 5100 2004-08-12 0
Gianni Motta Personal 59 red/green 4400 2000-05-01 8700
Gios Torino Super 60 blue 2000 1998-11-08 9000
Query Completed

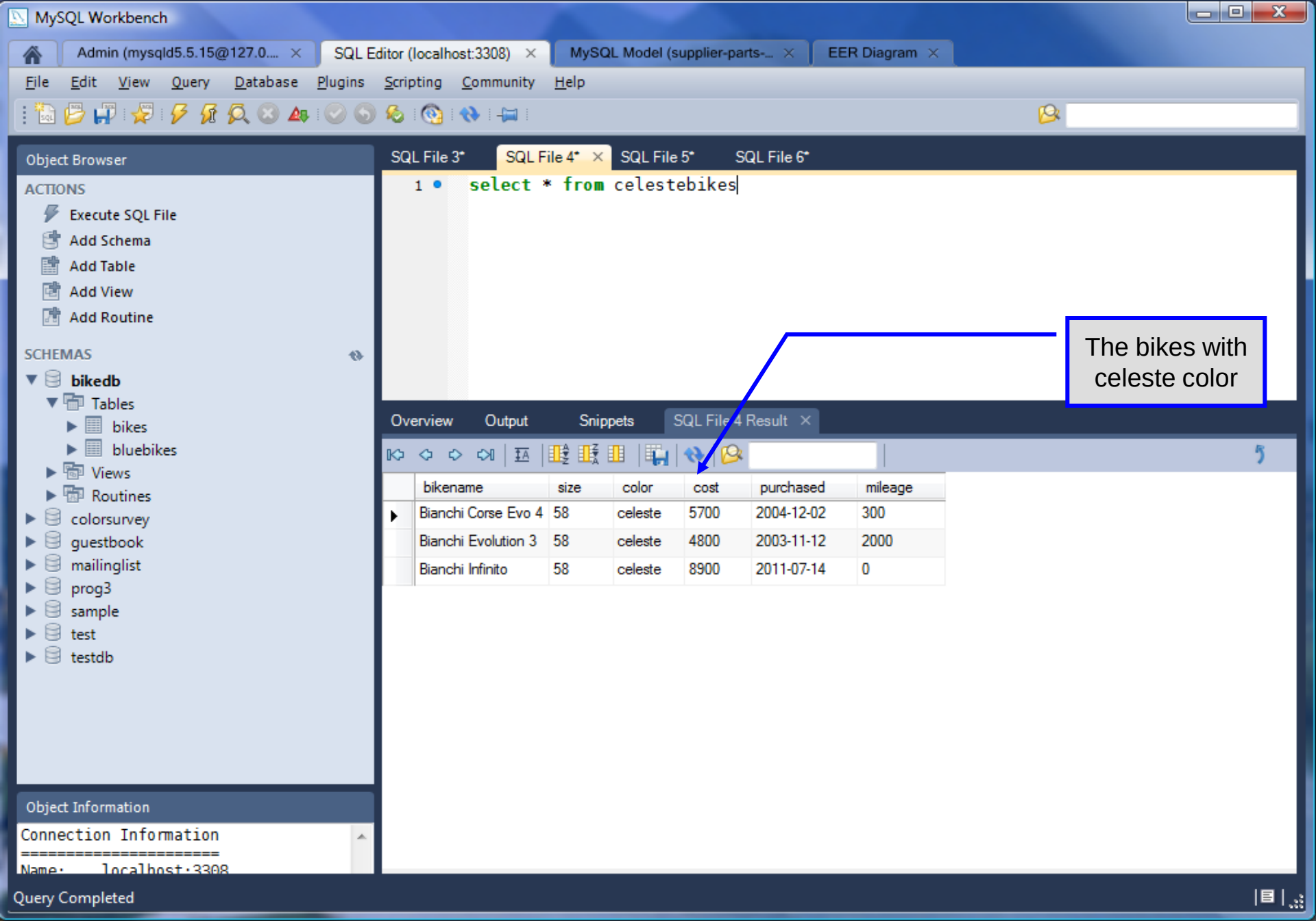
Examples: Inserting Data Into A Table

C:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

```
mysql> select * from bikes;
+-------------------------+------+-------------+------+------------+---------+
| bikename                | size | color       | cost | purchased  | mileage |
+-------------------------+------+-------------+------+------------+---------+
| Colnago Dream Rabobank  |   60 | blue/orange | 5500 | 2002-07-07 |    4300 |
| Bianchi Evolution 3     |   58 | celeste     | 4800 | 2003-11-12 |    2000 |
| Eddy Merckx Molteni     |   58 | orange      | 5100 | 2004-08-12 |       0 |
| Eddy Merckx Domo        |   58 | blue/black  | 5300 | 2004-02-02 |       0 |
| Battaglin Carrera       |   60 | red/white   | 4000 | 2001-03-10 |   11200 |
| Gianni Motta Personal   |   59 | red/green   | 4400 | 2000-05-01 |    8700 |
| Gios Torino Super       |   60 | blue        | 2000 | 1998-11-08 |    9000 |
| Schwinn Paramount P14   |   60 | blue        | 1800 | 1992-03-01 |     200 |
| Bianchi Corse Evo 4     |   58 | celeste     | 5700 | 2004-12-02 |     300 |
| Colnago Superissimo     |   59 | red         | 3800 | 1996-03-01 |   13000 |
| Ridley Damocles         |   58 | blue/black  | 7500 | 2008-06-27 |       0 |
+-------------------------+------+-------------+------+------------+---------+
11 rows in set (0.00 sec)

mysql> insert into bikes
    -> values ("Eddy Merckx AX5", 58, "black/red", 8000, "2010-02-02", 150);
Query OK, 1 row affected (0.00 sec)

mysql> select * from bikes;
+-------------------------+------+-------------+------+------------+---------+
| bikename                | size | color       | cost | purchased  | mileage |
+-------------------------+------+-------------+------+------------+---------+
| Colnago Dream Rabobank  |   60 | blue/orange | 5500 | 2002-07-07 |    4300 |
| Bianchi Evolution 3     |   58 | celeste     | 4800 | 2003-11-12 |    2000 |
| Eddy Merckx Molteni     |   58 | orange      | 5100 | 2004-08-12 |       0 |
| Eddy Merckx Domo        |   58 | blue/black  | 5300 | 2004-02-02 |       0 |
| Battaglin Carrera       |   60 | red/white   | 4000 | 2001-03-10 |   11200 |
| Gianni Motta Personal   |   59 | red/green   | 4400 | 2000-05-01 |    8700 |
| Gios Torino Super       |   60 | blue        | 2000 | 1998-11-08 |    9000 |
| Schwinn Paramount P14   |   60 | blue        | 1800 | 1992-03-01 |     200 |
| Bianchi Corse Evo 4     |   58 | celeste     | 5700 | 2004-12-02 |     300 |
| Colnago Superissimo     |   59 | red         | 3800 | 1996-03-01 |   13000 |
| Ridley Damocles         |   58 | blue/black  | 7500 | 2008-06-27 |       0 |
| Eddy Merckx AX5         |   58 | black/red   | 8000 | 2010-02-02 |     150 |
+-------------------------+------+-------------+------+------------+---------+
12 rows in set (0.00 sec)

mysql>
```

Using Form 2 for insertion – attribute order is important.


MySQL Workbench
Creates an initially empty table just like the bikes table
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bluebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
SQL File 3*
SQL File 4*
SQL File 5*
1 create table bikedb.celestebikes like bikes;
2 insert into celestebikes
3 select *
4 from bikes
5 where color = "celeste"
6
7
Using Form 3 for insertion
Overview
Output
Snippets
SQL File 4 Result
bikename size color cost purchased mileage
Battaglin Carrera 60 red/white 4000 2001-03-10 11200
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
BMC SLC01 - Swiss 58 red/black/white 8000 2010-06-23 0
Colnago Dream Rabobank 60 blue/orange 5500 2002-07-07 4300
Colnago Superissimo 59 red 3800 1996-03-01 13000
Eddy Merckx Domo 58 blue/black 5300 2004-02-02 0
Eddy Merckx EM7 58 red/white/blue 9500 2011-01-01 100
Eddy Merckx Molteni 58 orange 5100 2004-08-12 0
Gianni Motta Personal 59 red/green 4400 2000-05-01 8700
Gios Torino Super 60 blue 2000 1998-11-08 9000
Ridley Crosswind 58 black 6500 2010-04-05 2000
Object Information
Connection Information
Name: localhost:3308
Query Completed


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bluebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
SQL File 3*
SQL File 4*
SQL File 5*
SQL File 6*
1 select * from celestebikes
The bikes with celeste color
Overview
Output
Snippets
SQL File 4 Result
bikename size color cost purchased mileage
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
Object Information
Connection Information
Name: localhost:3308
Query Completed

Examples: Inserting Data Into A Table

C:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

```
mysql> show tables;
+-----------------+
| Tables_in_bikedb |
+-----------------+
| bikes           |
| bluebikes       |
+-----------------+
2 rows in set (0.00 sec)

mysql> create table celestebikes like bikes;
Query OK, 0 rows affected (0.04 sec)

mysql> select * from celestebikes;
Empty set (0.00 sec)

mysql> insert into celestebikes
    -> select *
    -> from bikes
    -> where color = "celeste";
Query OK, 2 rows affected (0.00 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from celestebikes;
+--------------------+------+---------+------+------------+---------+
| bikename           | size | color   | cost | purchased  | mileage |
+--------------------+------+---------+------+------------+---------+
| Bianchi Evolution 3 |   58 | celeste | 4800 | 2003-11-12 |    2000 |
| Bianchi Corse Evo 4 |   58 | celeste | 5700 | 2004-12-02 |     300 |
+--------------------+------+---------+------+------------+---------+
2 rows in set (0.00 sec)

mysql> _
```

Creates an initially empty table just like the bikes table

Table creation did not place any data into the table

Using Form 3 for insertion

This table contains the name and cost of those bikes whose color was celeste from the source table.

Examples: Inserting Data Into A Table

C:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

```
mysql> create table celestebikes (
    -> name varchar(30),
    -> paint varchar(15),
    -> price int(6),
    -> miles_ridden int(6),
    -> primary key (name)
    -> );
Query OK, 0 rows affected (0.05 sec)

mysql> insert into celestebikes
    -> select bikename, color, cost, mileage
    -> from bikes
    -> where color="celeste";
Query OK, 2 rows affected (0.00 sec)
Records: 2  Duplicates: 0  Warnings: 0

mysql> select * from celestebikes;
+--------------------+---------+-------+--------------+
| name               | paint   | price | miles_ridden |
+--------------------+---------+-------+--------------+
| Bianchi Evolution 3 | celeste |  4800 |         2000 |
| Bianchi Corse Evo 4 | celeste |  5700 |          300 |
+--------------------+---------+-------+--------------+
2 rows in set (0.00 sec)

mysql>
```

Create an initially empty table with a schema different from the base table.

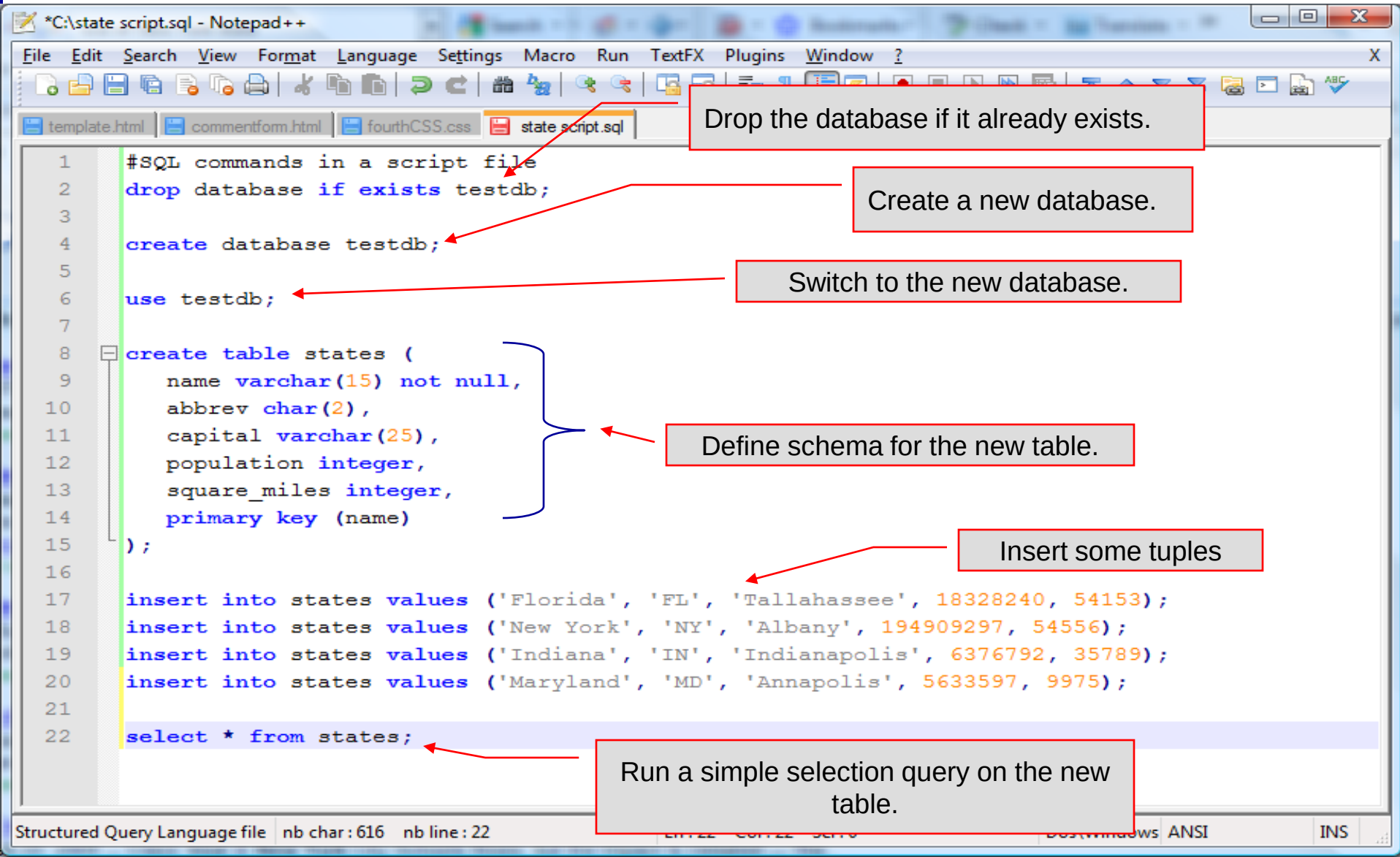
Using Form 3 for insertion

This table contains the those bike tuples whose color was celeste from the source table.

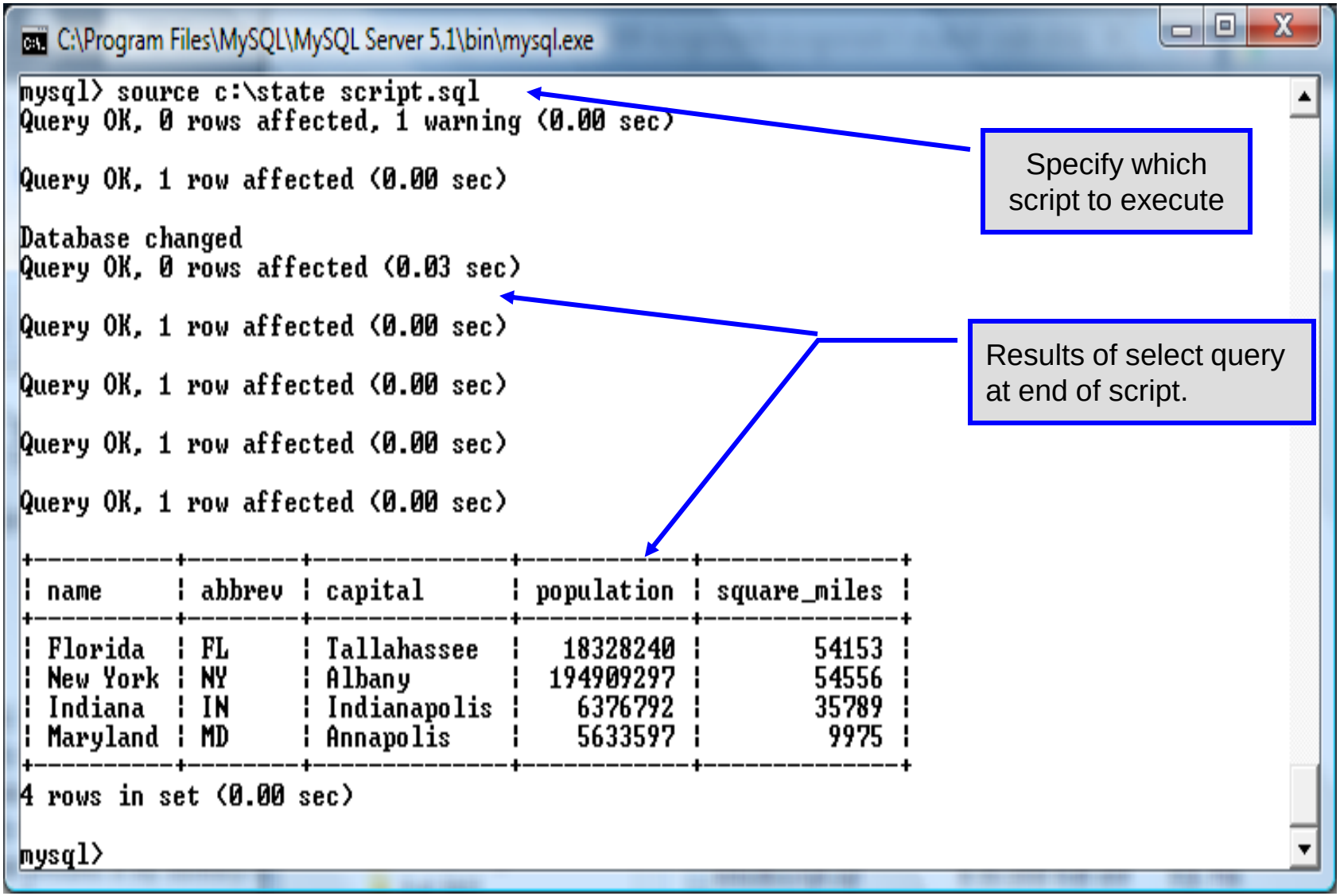
Using Scripts with MySQL

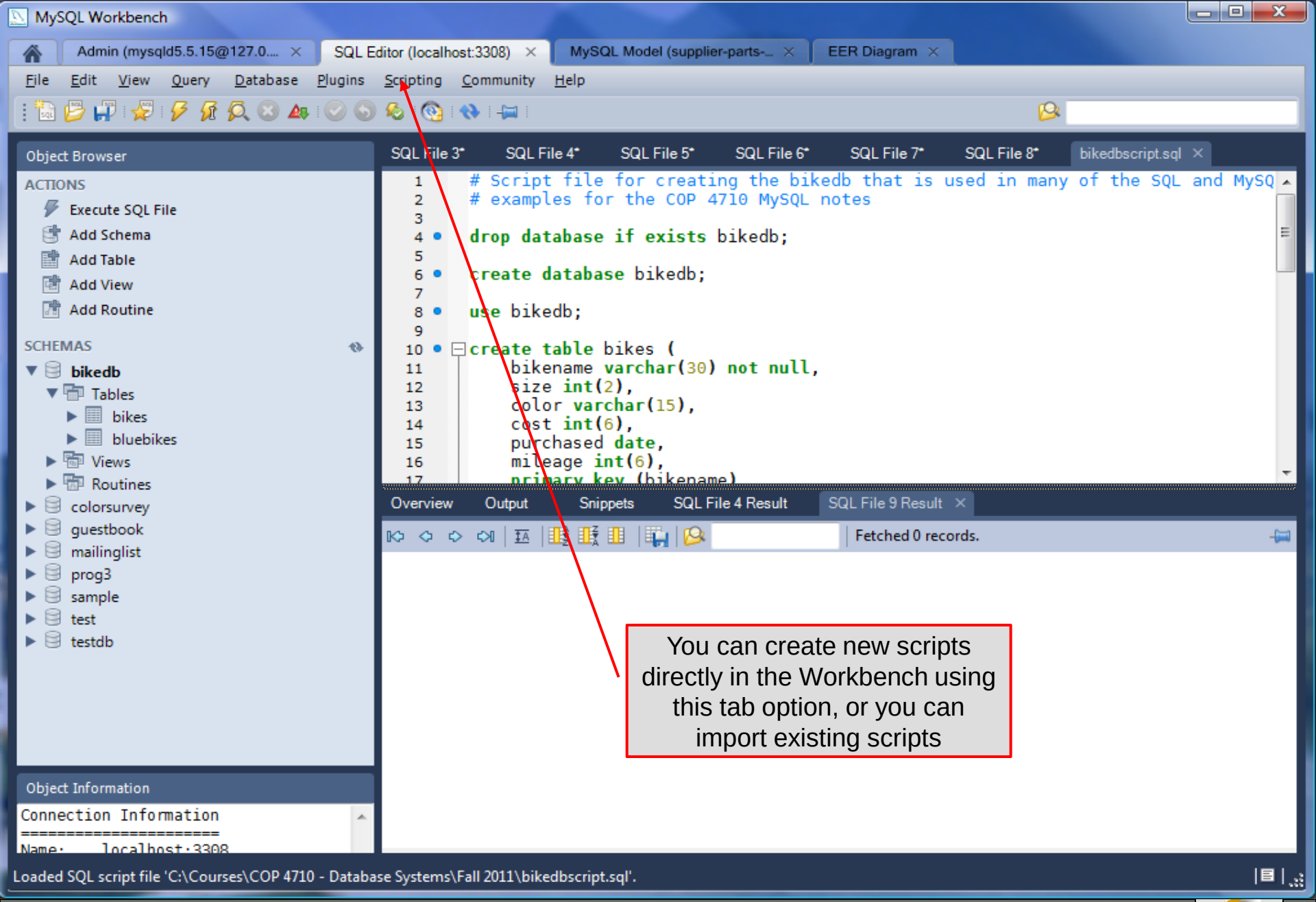
- Entering data to create sample databases using conventional SQL commands is tedious and prone to errors. A much simpler technique is to use scripts. The following illustrates two techniques for invoking scripts in MySQL.
- Create your script file using the text editor of your choice.
- Comments in the SQL script files begin with a # symbol.
- In the script file example shown on the next slide, I drop the database in the first SQL command. Without the if exists clause, this will generate an error if the database does not exist. The first time the script executes (or subsequent executions if the database is dropped independently) the error will be generated…simply ignore the error.

Using Scripts with MySQL (cont.)



Using Scripts with MySQL (cont.)




MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
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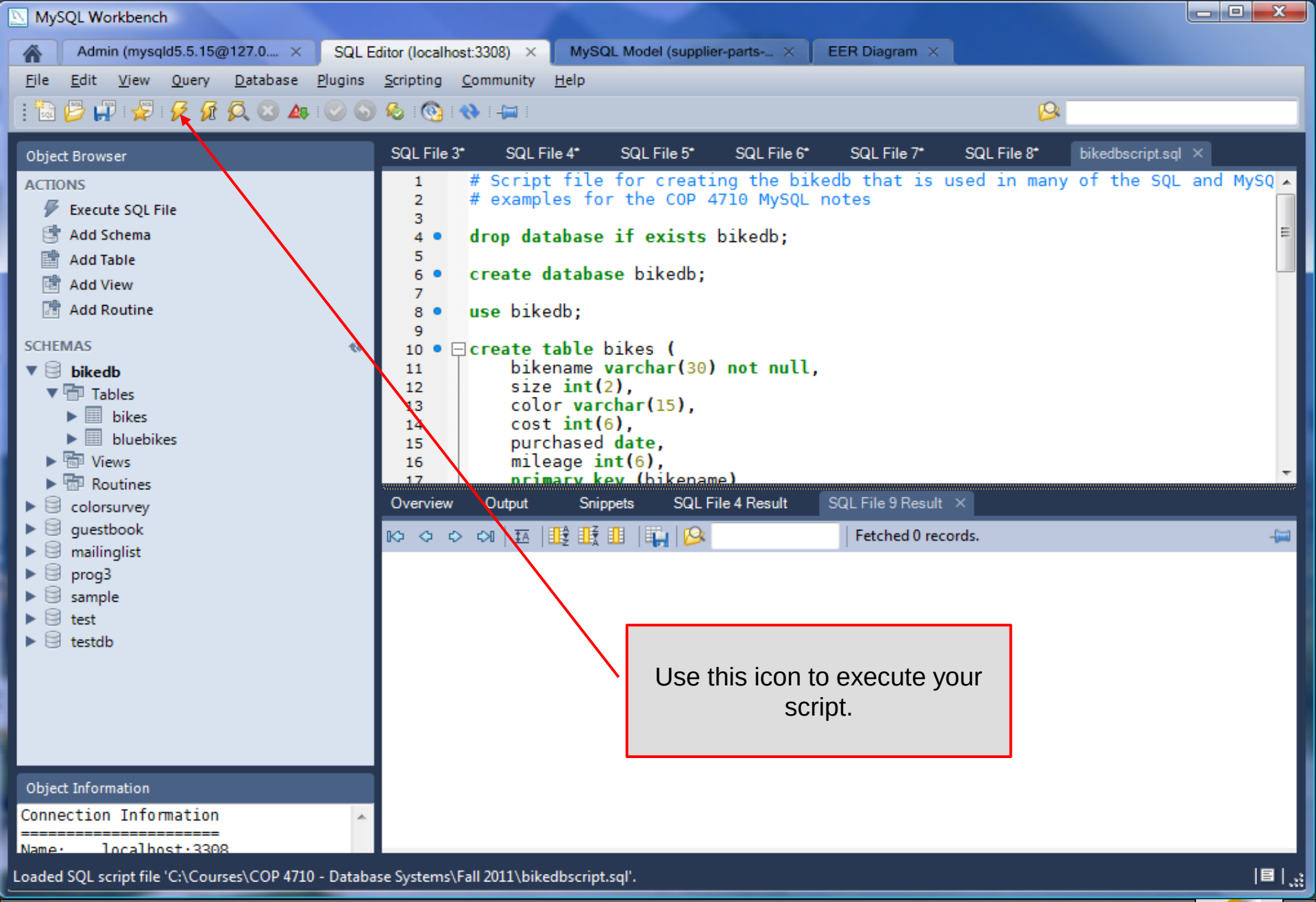
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bluebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
SQL File 3*
SQL File 4*
SQL File 5*
SQL File 6*
SQL File 7*
SQL File 8*
bikedbscript.sql
1 # Script file for creating the bikedb that is used in many of the SQL and MySQ
2 # examples for the COP 4710 MySQL notes
3
4 drop database if exists bikedb;
5
6 create database bikedb;
7
8 use bikedb;
9
10 create table bikes (
11 bikename varchar(30) not null,
12 size int(2),
13 color varchar(15),
14 cost int(6),
15 purchased date,
16 mileage int(6),
17 primary key (bikename)
Overview
Output
Snippets
SQL File 4 Result
SQL File 9 Result
Fetched 0 records.
You can create new scripts directly in the Workbench using this tab option, or you can import existing scripts
Object Information
Connection Information
Name: localhost:3308
Loaded SQL script file 'C:\Courses\COP 4710 - Database Systems\Fall 2011\bikedbscript.sql'.


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
Object Browser
ACTIONS
Execute SQL File
Add Schema
Add Table
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bluebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
SQL File 3*
SQL File 4*
SQL File 5*
SQL File 6*
SQL File 7*
SQL File 8*
bikedbscript.sql
1 # Script file for creating the bikedb that is used in many of the SQL and MySQ
2 # examples for the COP 4710 MySQL notes
3
4 drop database if exists bikedb;
5
6 create database bikedb;
7
8 use bikedb;
9
10 create table bikes (
11 bikename varchar(30) not null,
12 size int(2),
13 color varchar(15),
14 cost int(6),
15 purchased date,
16 mileage int(6),
17 primary key (bikename)
Overview
Output
Snippets
SQL File 4 Result
SQL File 9 Result
Fetched 0 records.
Use this icon to execute your script.
Object Information
Connection Information
Loaded SQL script file 'C:\Courses\COP 4710 - Database Systems\Fall 2011\bikedbscript.sql'.

Importing Data Using the `mysqlimport` Utility

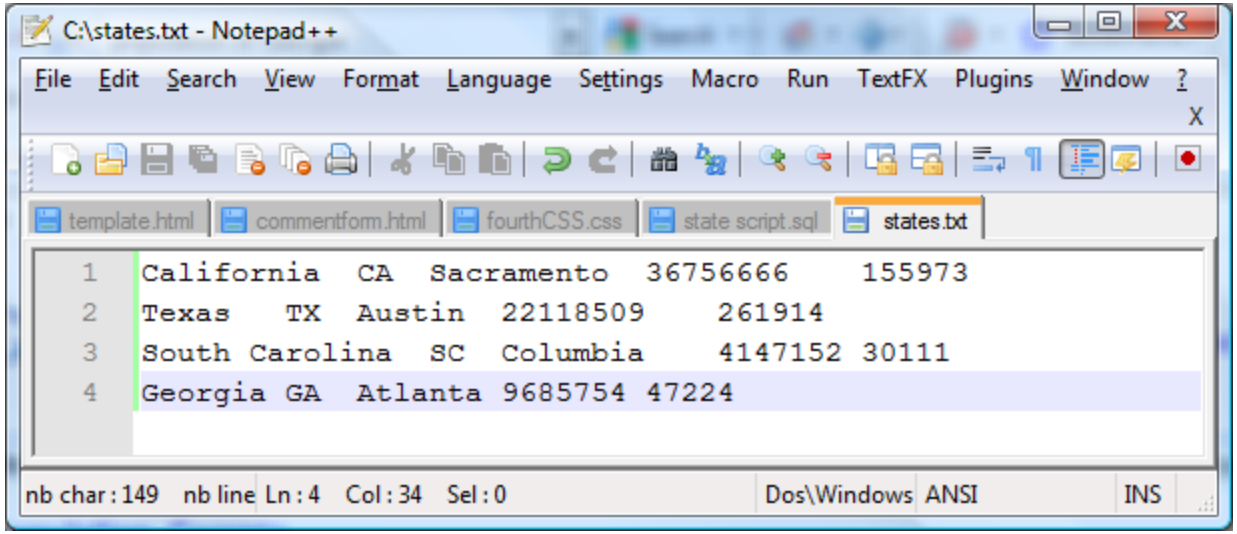
- As with many things in MySQL there are several ways to accomplish a specific task. For getting data into tables, the `mysqlimport` utility is also useful.
- The `mysqlimport` utility reads a range of data formats, including comma- and tab- delimited, and inserts the data into a specified database table. The syntax for `mysqlimport` is:

```
mysqlimport [options] database_name file1 file2 …
```

- This utility is designed to be invoked from the command line.
- The name of the file (excluding the extension) must match the name of the database table into which the data import will occur. Failure to match names will result in an error.

Importing Data Using the `mysqlimportUtility` (cont.)

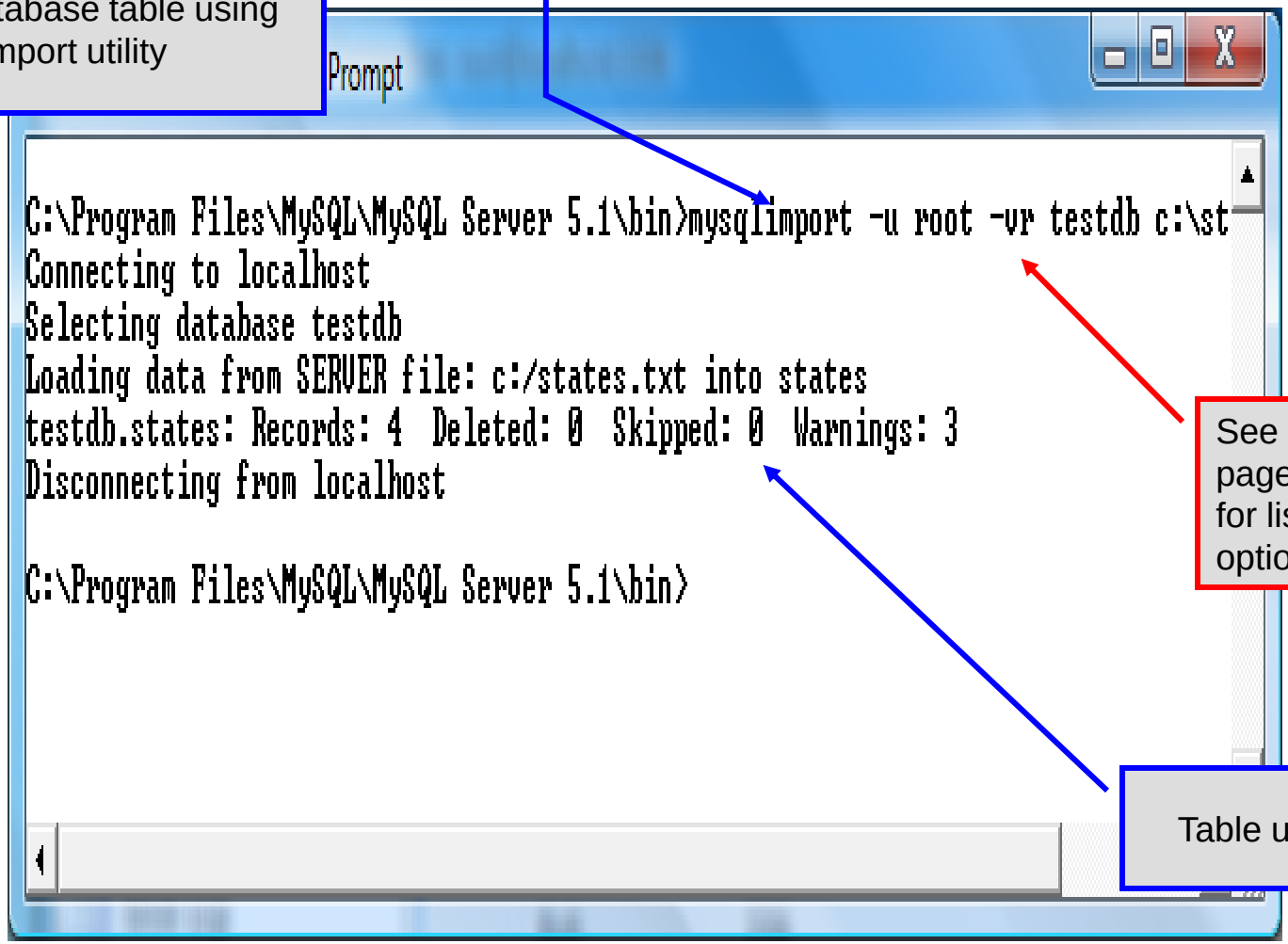
- The file shown below was created to import additional data into the states table within the testdb database used in the previous example.



- In this case, the default field delimiter (tab), default field enclosure (nothing), and the default line delimiter (\n) were used. Many options are available and are illustrated in the table on pages 65-66.

Importing Data Using the `mysqlimportUtility`

Importing a "data file" into a MySQL database table using the mysqlimport utility



See tables on pages 23-24 for listing of options.

Table updated

Importing Data Using the `mysqlimportUtility`

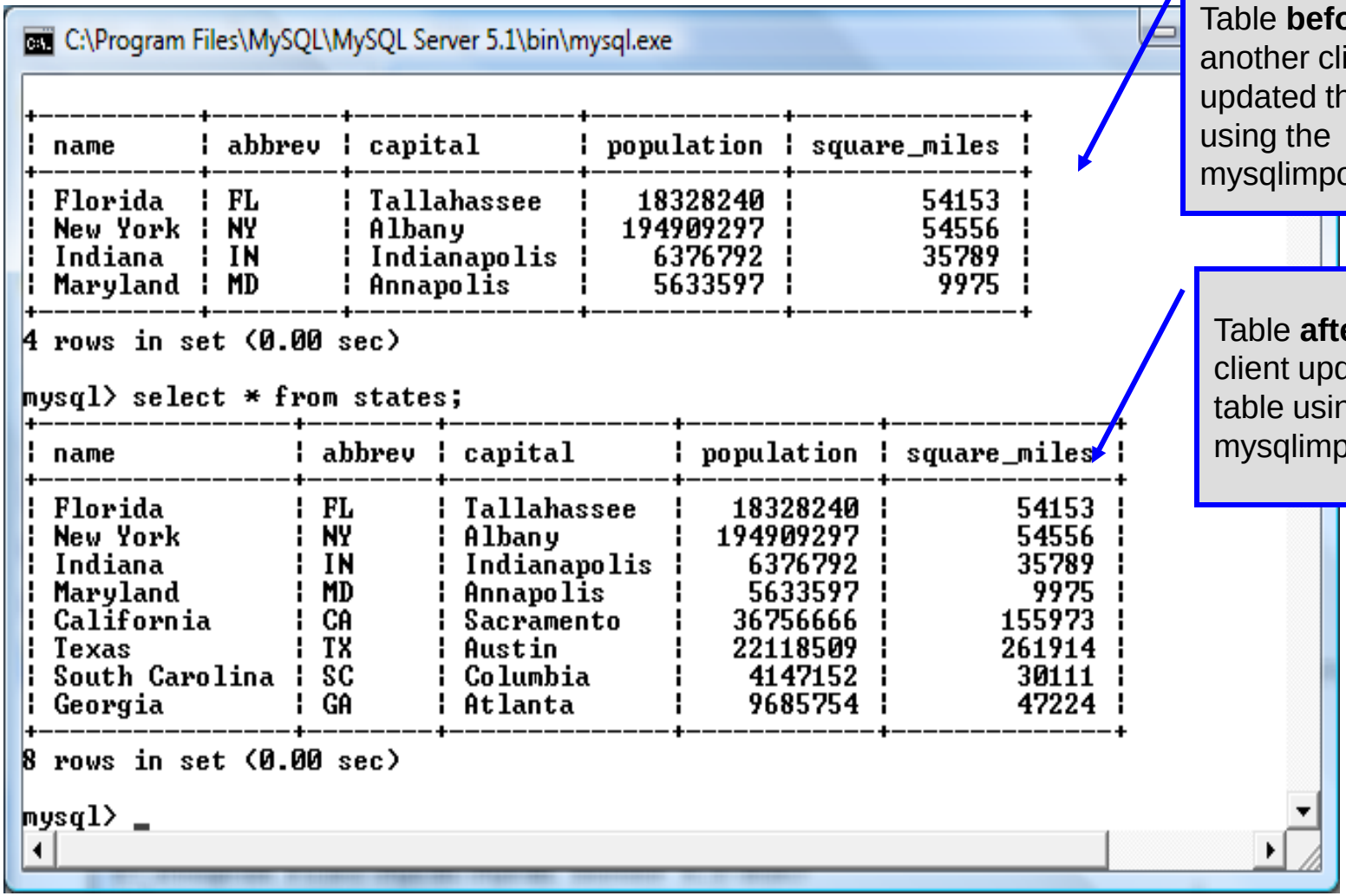


Table **before** another client updated the table using the mysqlimport utility.

Table **after** another client updated the table using the mysqlimport utility.

mysqlimportUtility Options

Option	Action
-r or –replace	Causes imported rows to overwrite existing rows if they have the same unique key value.
-i or –ignore	Ignores rows that have the same unique key value as existing rows.
-f or –force	Forces mysqlimport to continue inserting data even if errors are encountered.
-l or –lock	Lock each table before importing (a good idea in general and especially on a busy server).
-d or –delete	Empty the table before inserting data.
--fields-terminated-by='char'	Specify the separator used between values of the same row, default \t (tab).
--fields-enclosed-by='char'	Specify the delimiter that encloses each field, default is none.

mysqlimport Utility Options (cont.)

Option	Action
--fields-optionally-enclosed-by='char'	Same as –fields-enclosed-by, but delimiter is used only to enclosed string-type columns, default is none.
--fields-escaped-by='char'	Specify the escape character placed before special characters; default is \.
--lines-terminated-by='char'	Specify the separator used to terminate each row of data, default is \n (newline).
-u or –user	Specify your username
-p or –password	Specify your password
-h or –host	Import into MySQL on the named host; default is localhost.
-s or –silent	Silent mode, output appears only when errors occur.
-v or –verbose	Verbose mode, print more commentary on action.
-? or –help	Print help message and exit

Importing Data From A File With SQL Statement `Load Data Infile`

- Using the utility `mysqlimport` to load data into a table from an external file works well if the user has access to a command window or command line.
- If you have access via a connection to only the MySQL database, or you are importing data from within an executing application, you will need to use the SQL statement `Load Data Infile`.
- The Load Data Infile statement also provides a bit more flexibility since the file name does not need to match the table name. Other than that the options are basically the same and the same results are accomplished.
- The example on page 70 illustrates this SQL command which is available in MySQL.

Importing Data From A File With SQL Statement `Load Data Infile` (cont.)

- The basic form of the Load Data Infile statement is:

```
LOAD DATA [LOW_PRIORITY | CONCURRENT] [LOCAL] INFILE 'filename'
[REPLACE | IGNORE]
INTO TABLE tablename
[FIELDS
     [TERMINATED BY 'char']
     [ [OPTIONALLY] ENCLOSED BY 'char']
     [ESCAPED BY '\char']  ]
[LINES
     [STARTING BY 'char']
     [TERMINATED BY 'char']  ]
[IGNORE number LINES]
[(column_name, … )]
```

Either allow concurrent update or block until no other clients are reading from the specified table. See page 75.

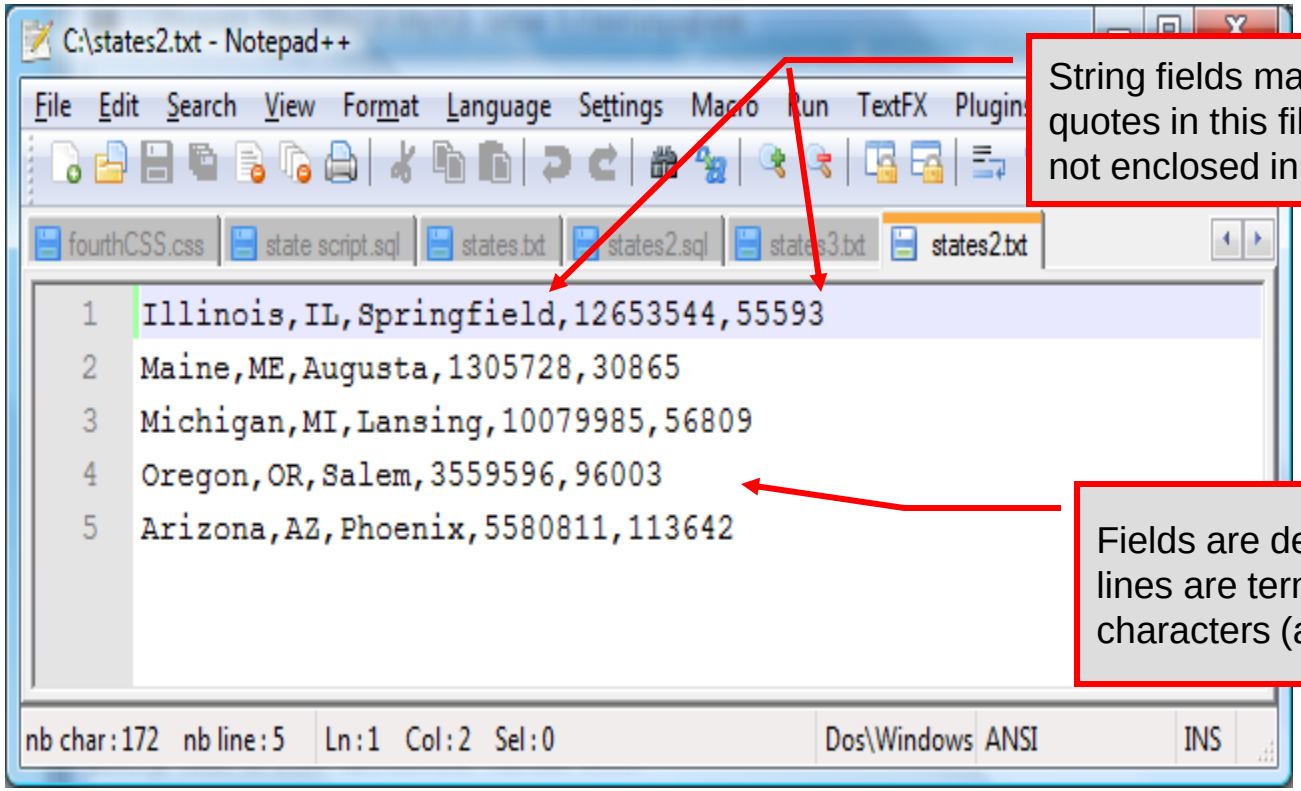
Same as –r and –i options in mysqlimport utility – either replace or ignore rows with duplicate keys.

Sets the characters that delimit and enclose the fields and lines in the data file. Similar to mysqlimport syntax.

Ignores lines at the start of the file (miss header info)

Used to load only certain columns (not entire rows)

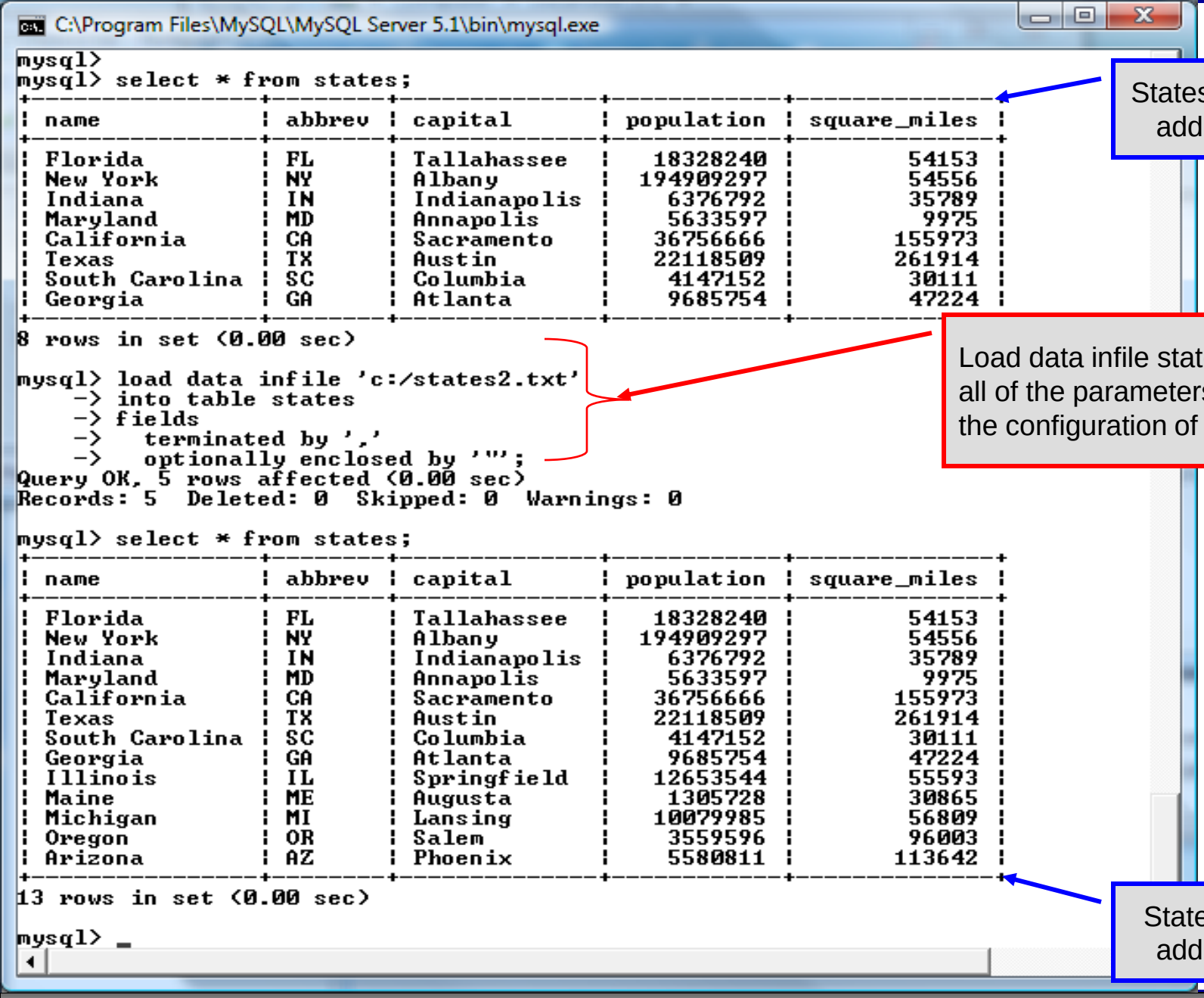
Load Data Infile Example



String fields may be enclosed by double quotes in this file. Numeric values are not enclosed in quotes.

Fields are delimited by commas and lines are terminated by newline characters (an invisible \n)

Text file containing the data to be loaded into the database table.

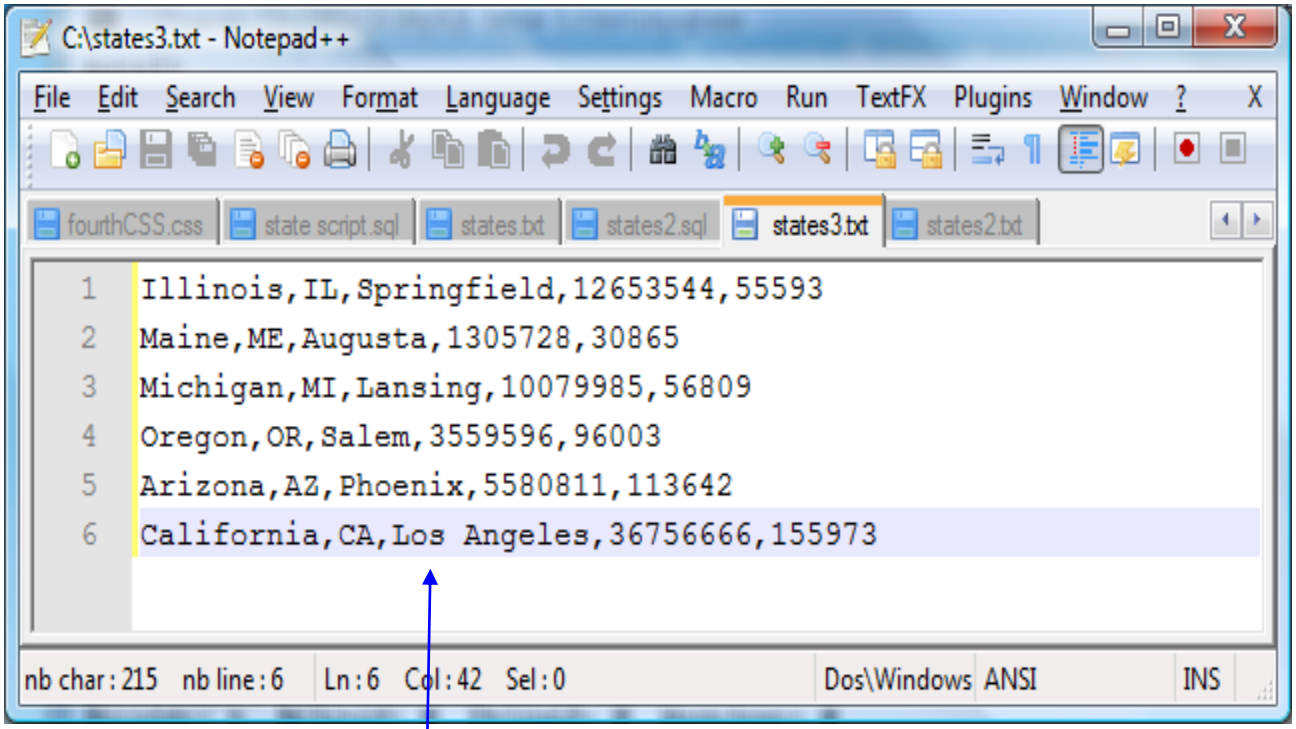


States table **before** addition of data

Load data infile statement indicating all of the parameters which describe the configuration of the input file.

States table **after** addition of data

Load Data Infile Example 2



Text file containing the data to be loaded into the database table.

California already exists in the states table – this one will replace the value of the capital with a different value.

C:\Program Files\MySQL\MySQL Server 5.1\bin\mysql.exe

```
mysql> select * from states;
+----------------+--------+--------------+------------+--------------+
| name           | abbrev | capital      | population | square_miles |
+----------------+--------+--------------+------------+--------------+
| Florida        | FL     | Tallahassee  |   18328240 |        54153 |
| New York       | NY     | Albany       |  194909297 |        54556 |
| Indiana        | IN     | Indianapolis |    6376792 |        35789 |
| Maryland       | MD     | Annapolis    |    5633597 |         9975 |
| California     | CA     | Sacramento   |   36756666 |       155973 |
| Texas          | TX     | Austin       |   22118509 |       261914 |
| South Carolina | SC     | Columbia     |    4147152 |        30111 |
| Georgia        | GA     | Atlanta      |    9685754 |        47224 |
| Illinois       | IL     | Springfield  |   12653544 |        55593 |
| Maine          | ME     | Augusta      |    1305728 |        30865 |
| Michigan       | MI     | Lansing      |   10079985 |        56809 |
| Oregon         | OR     | Salem        |    3559596 |        96003 |
| Arizona        | AZ     | Phoenix      |    5580811 |       113642 |
+----------------+--------+--------------+------------+--------------+
13 rows in set (0.00 sec)

mysql> load data infile 'c:/states3.txt'
    -> replace into table states
    -> fields
    ->   terminated by ','
    ->   optionally enclosed by '"';
Query OK, 12 rows affected (0.00 sec)
Records: 6  Deleted: 6  Skipped: 0  Warnings: 0

mysql> select * from states;
+----------------+--------+--------------+------------+--------------+
| name           | abbrev | capital      | population | square_miles |
+----------------+--------+--------------+------------+--------------+
| Florida        | FL     | Tallahassee  |   18328240 |        54153 |
| New York       | NY     | Albany       |  194909297 |        54556 |
| Indiana        | IN     | Indianapolis |    6376792 |        35789 |
| Maryland       | MD     | Annapolis    |    5633597 |         9975 |
| California     | CA     | Los Angeles  |   36756666 |       155973 |
| Texas          | TX     | Austin       |   22118509 |       261914 |
| South Carolina | SC     | Columbia     |    4147152 |        30111 |
| Georgia        | GA     | Atlanta      |    9685754 |        47224 |
| Illinois       | IL     | Springfield  |   12653544 |        55593 |
| Maine          | ME     | Augusta      |    1305728 |        30865 |
| Michigan       | MI     | Lansing      |   10079985 |        56809 |
| Oregon         | OR     | Salem        |    3559596 |        96003 |
| Arizona        | AZ     | Phoenix      |    5580811 |       113642 |
+----------------+--------+--------------+------------+--------------+
13 rows in set (0.00 sec)

mysql> _
```

States table **before** addition of data

Same basic configuration as in previous example except that we have instructed MySQL to replace duplicate key value rows with new values (in this case replacing California's capital).

States table **after** addition of data. Note that California's capital has been changed!

Inserting/Replacing Data Using `Replace`

- Data can also be entered into a MySQL table using the `replace` command.
- The `replace` statement has forms similar to the `insert` statement:

Form 1

```
replace [low priority | delayed] [ignore] [into]table_name
        [set] column_name1 = expression1,
              column_name2 = expression2, …
```

Form 2

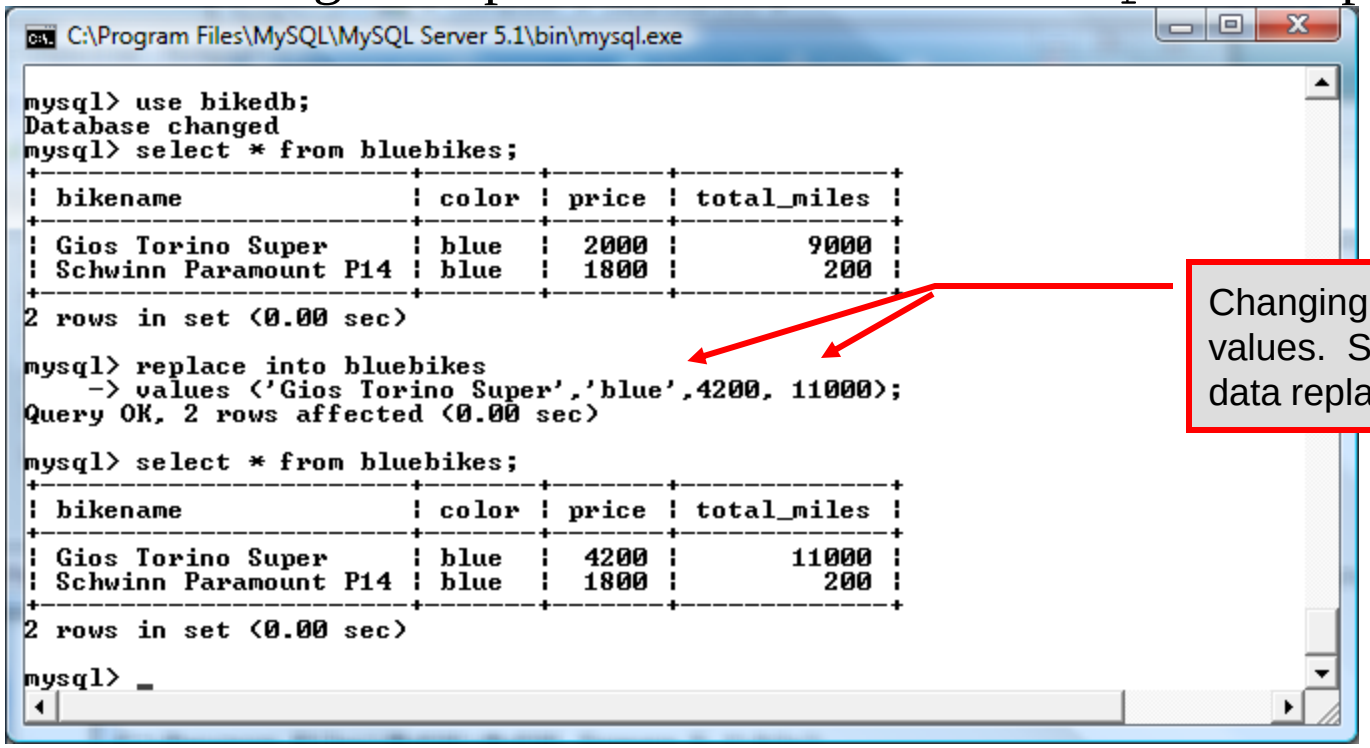
```
replace [low priority | delayed] [ignore] [into]table_name
        [(column_name,…)]values (expression,…), (…)…
```

Form 3

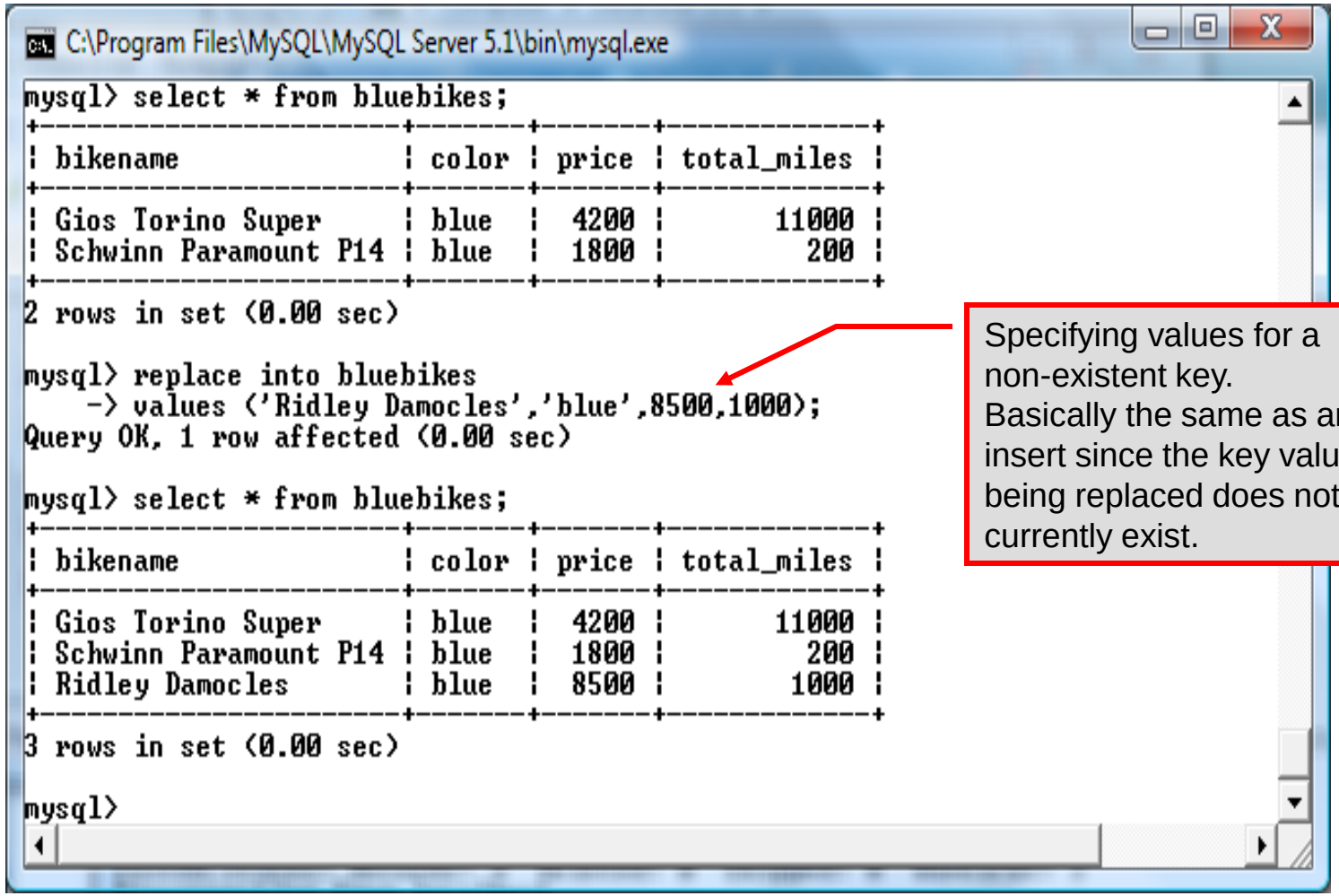
```
replace [low priority | delayed] [ignore] [into]table_name
        [(column_name,…)] select…
```


Using `replace`

- The `replace` statement works similar to `insert`. It always tries to insert the new data, but when it tries to insert a new row with the same primary or unique key as an existing row, it deletes the old row and replaces it with the new values.
- The following examples will illustrate how `replace` operates.



Using `Replace` (cont.)



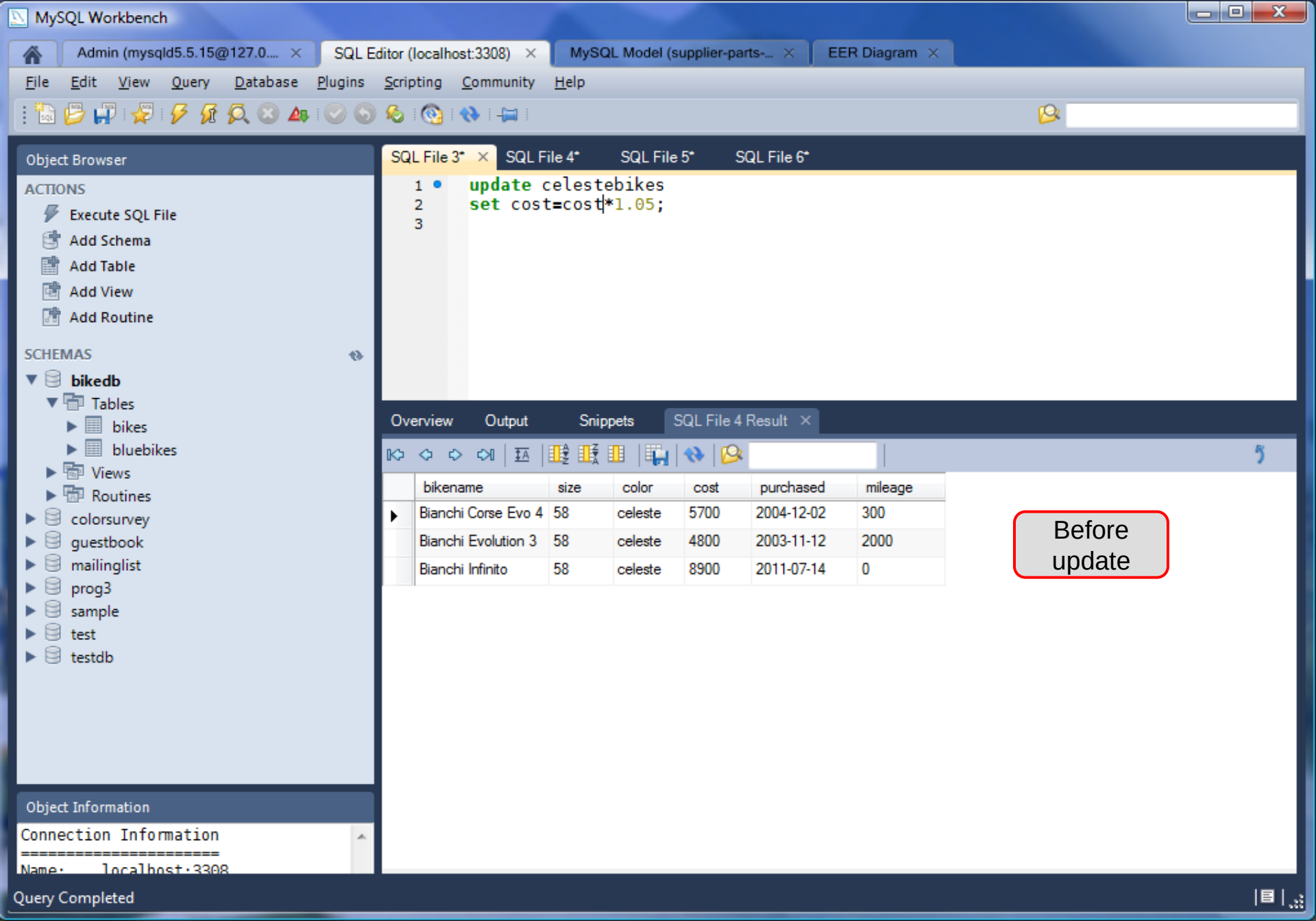
Specifying values for a non-existent key. Basically the same as an insert since the key value being replaced does not currently exist.

Performing Updates on Tables

- The `update` command allows you to modify the values of the existing data in a table. The basic format of the statement is:

```
update [low priority] [ignore] table_name
    set column_name1 = expression1,
        column_name2 = expression2, …
    [where where_definition]
    [limit num];
```

- There are basically two parts to the statement: the `set` portion to declare which column to set to what value; and the `where` portion, which defines which rows are to be affected.
- `Limit` restricts the number of rows affected to `num`.


MySQL Workbench
Admin (mysqld5.5.15@127.0....
SQL Editor (localhost:3308)
MySQL Model (supplier-parts-...
EER Diagram
File Edit View Query Database Plugins Scripting Community Help
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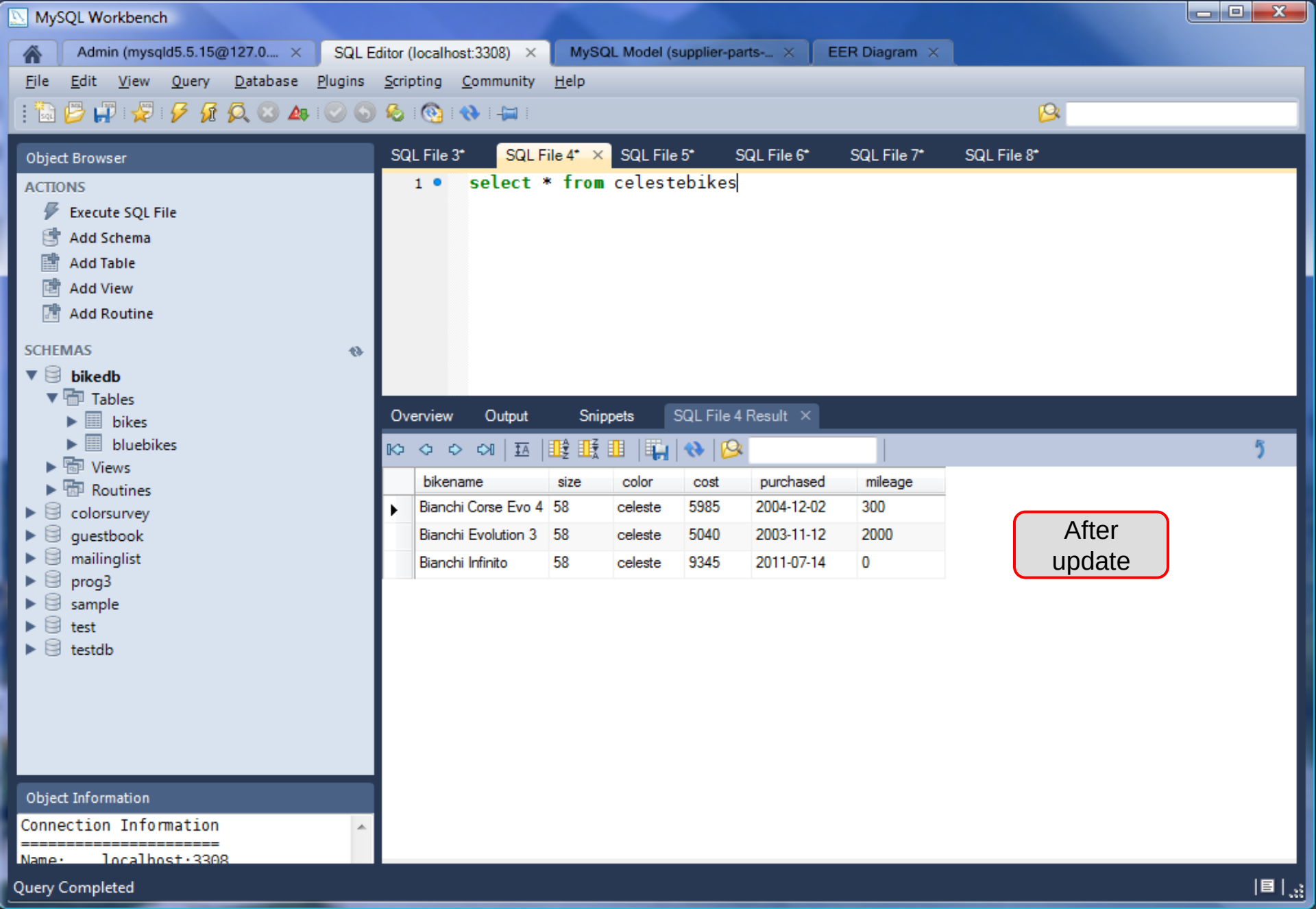
SCHEMAS
bikedb
Tables
bikes
bluebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
SQL File 3*
SQL File 4*
SQL File 5*
SQL File 6*
1 update celestebikes
2 set cost=cost*1.05;
3
Overview
Output
Snippets
SQL File 4 Result
bikename size color cost purchased mileage
Bianchi Corse Evo 4 58 celeste 5700 2004-12-02 300
Bianchi Evolution 3 58 celeste 4800 2003-11-12 2000
Bianchi Infinito 58 celeste 8900 2011-07-14 0
Before update
Object Information
Connection Information
Query Completed


MySQL Workbench
Admin (mysqld5.5.15@127.0....
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File Edit View Query Database Plugins Scripting Community Help
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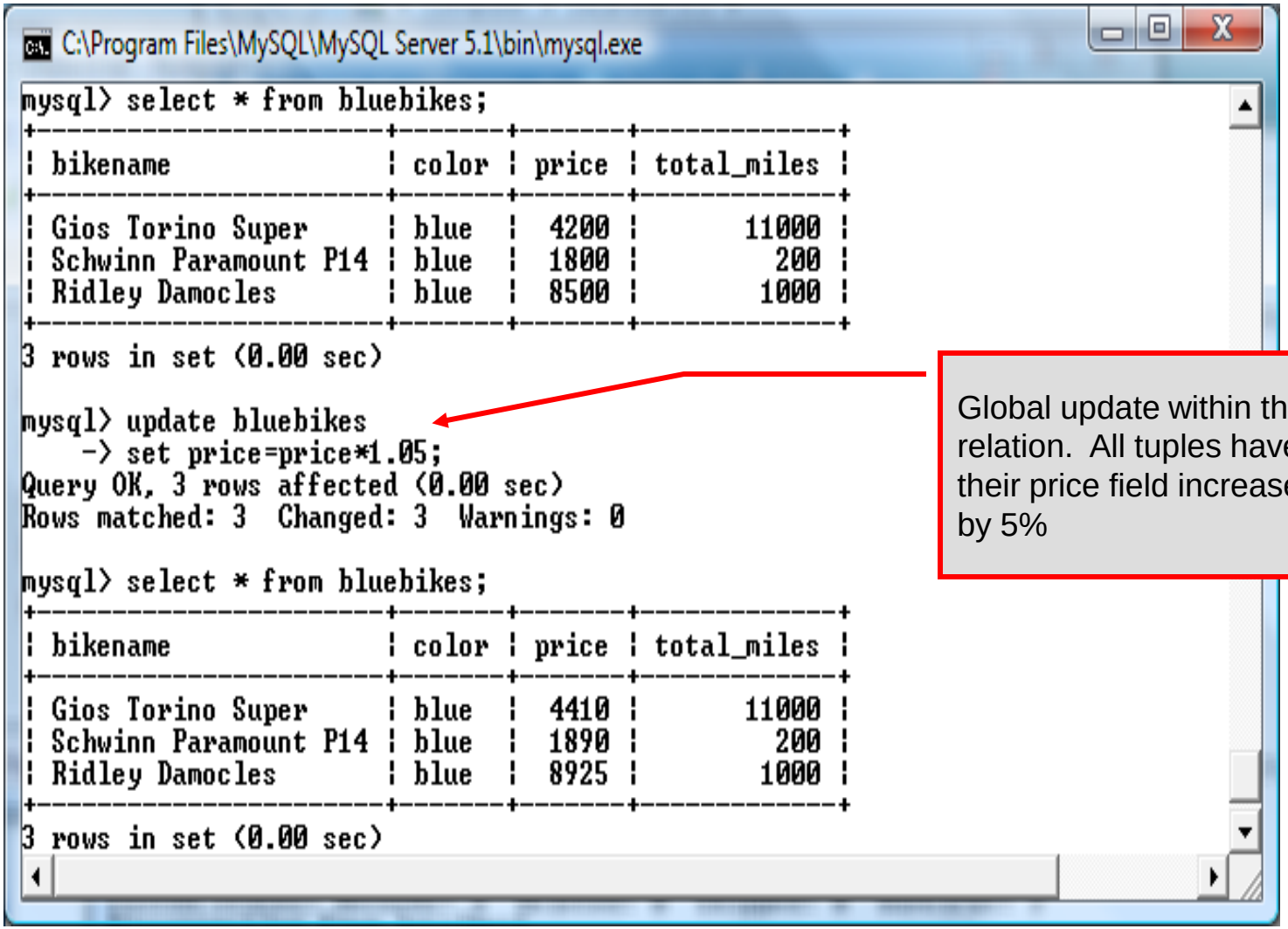
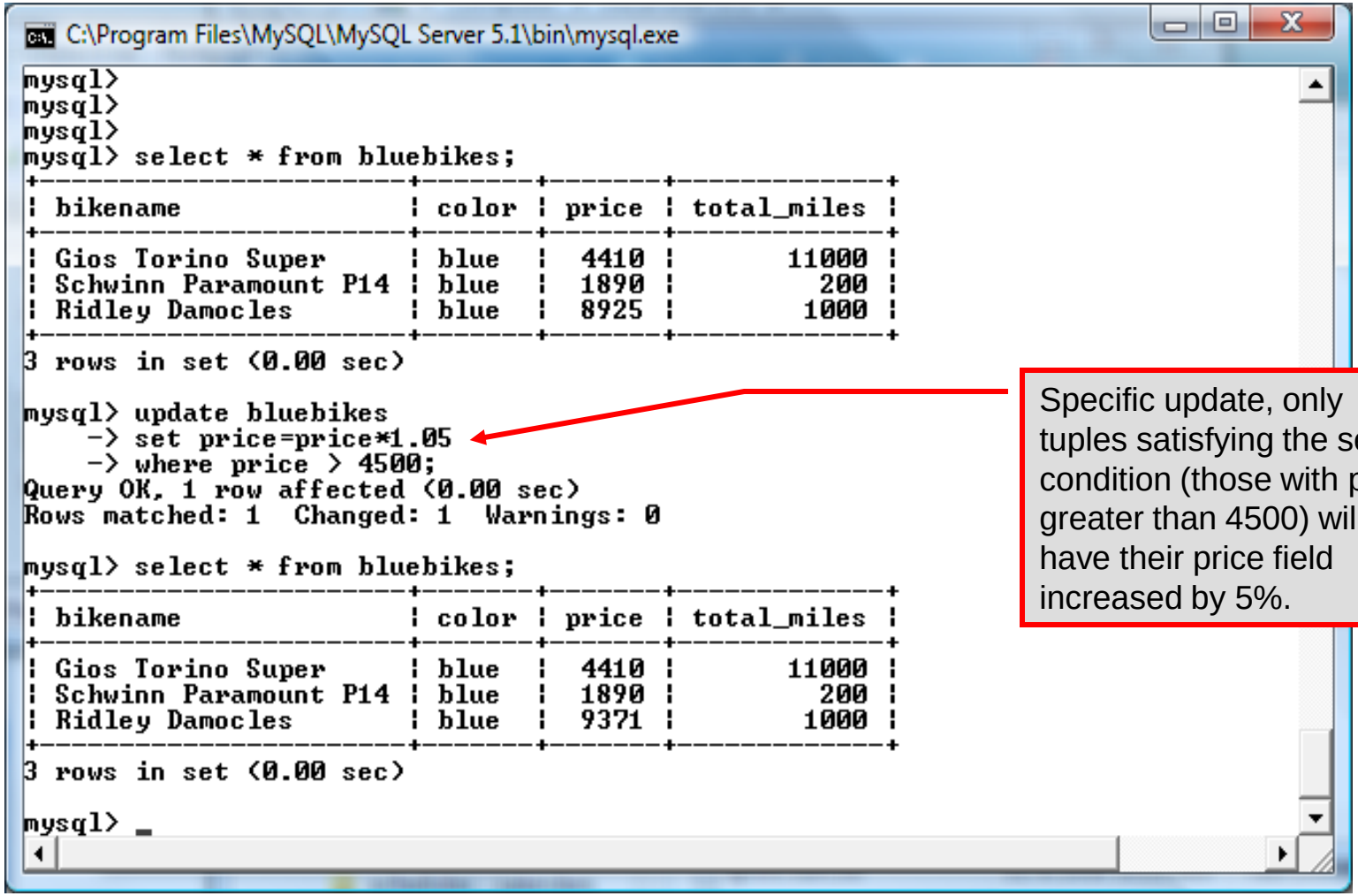
Add View
Add Routine
SCHEMAS
bikedb
Tables
bikes
bluebikes
Views
Routines
colorsurvey
guestbook
mailinglist
prog3
sample
test
testdb
SQL File 3*
SQL File 4*
SQL File 5*
SQL File 6*
SQL File 7*
SQL File 8*
1 select * from celestebikes
Overview
Output
Snippets
SQL File 4 Result
bikename size color cost purchased mileage
Bianchi Corse Evo 4 58 celeste 5985 2004-12-02 300
Bianchi Evolution 3 58 celeste 5040 2003-11-12 2000
Bianchi Infinito 58 celeste 9345 2011-07-14 0
After update
Object Information
Connection Information
Query Completed

Using `update` (cont.)



Global update within the relation. All tuples have their price field increased by 5%

Using `update` (cont.)



Specific update, only tuples satisfying the select condition (those with price greater than 4500) will have their price field increased by 5%.

Select Queries in MySQL

- The `select` command in MySQL is basically the same as in the standard SQL, however, it does have some additional features. The basic format of the statement is (not all options are shown – for complete details see the SQL Manual):

```
SELECT [ALL | DISTINCT | DISTINCTROW][HIGH_PRIORITY]
       [STRAIGHT JOIN] [SQL_SMALL_RESULT][SQL_BIG_RESULT]
       [SQL_BUFFER_RESULT][SQ_CACHE | SQL_NO_CACHE]
       select_expression, …
   [INTO {OUTFILE | DUMPFILE} 'path/to/filename' export_options]
   [FROM table_references
        WHERE where_definition]
        [GROUP BY {col_name | col_alias | col_pos | formula}
                 [asc |desc], …]
        [HAVING where_definition]
        [ORDER BY {col_name | col_alias | col_pos | formula}
                 [asc | desc], …]
        [LIMIT [offset, ] num_rows]
        [PROCEDURE procedure_name];
```