

Chapter 2

How to use MySQL Workbench and other development tools

Objectives

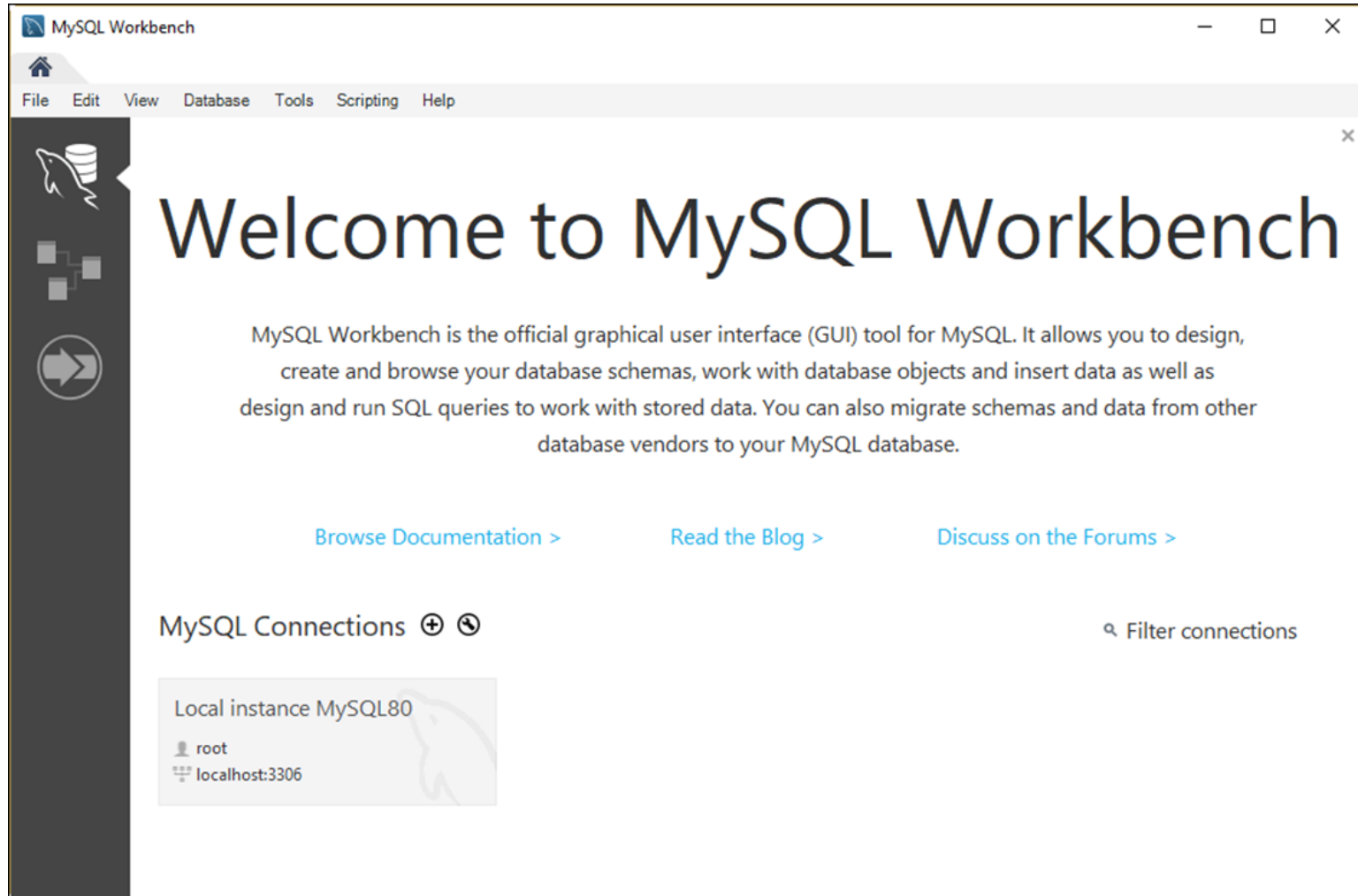
1. Start or stop the MySQL database server.
2. Use MySQL Workbench to do any of the following:
3. Create a database connection
Navigate through the objects of a database
View the column definitions for a table
View the data for a table
Edit the column definitions for a table
4. Use MySQL Workbench to enter, run, open, and save SQL statements and scripts.
5. Use the MySQL Reference Manual to look up information about SQL statements.
6. Use MySQL Monitor to run a SQL statement.

Objectives (continued)

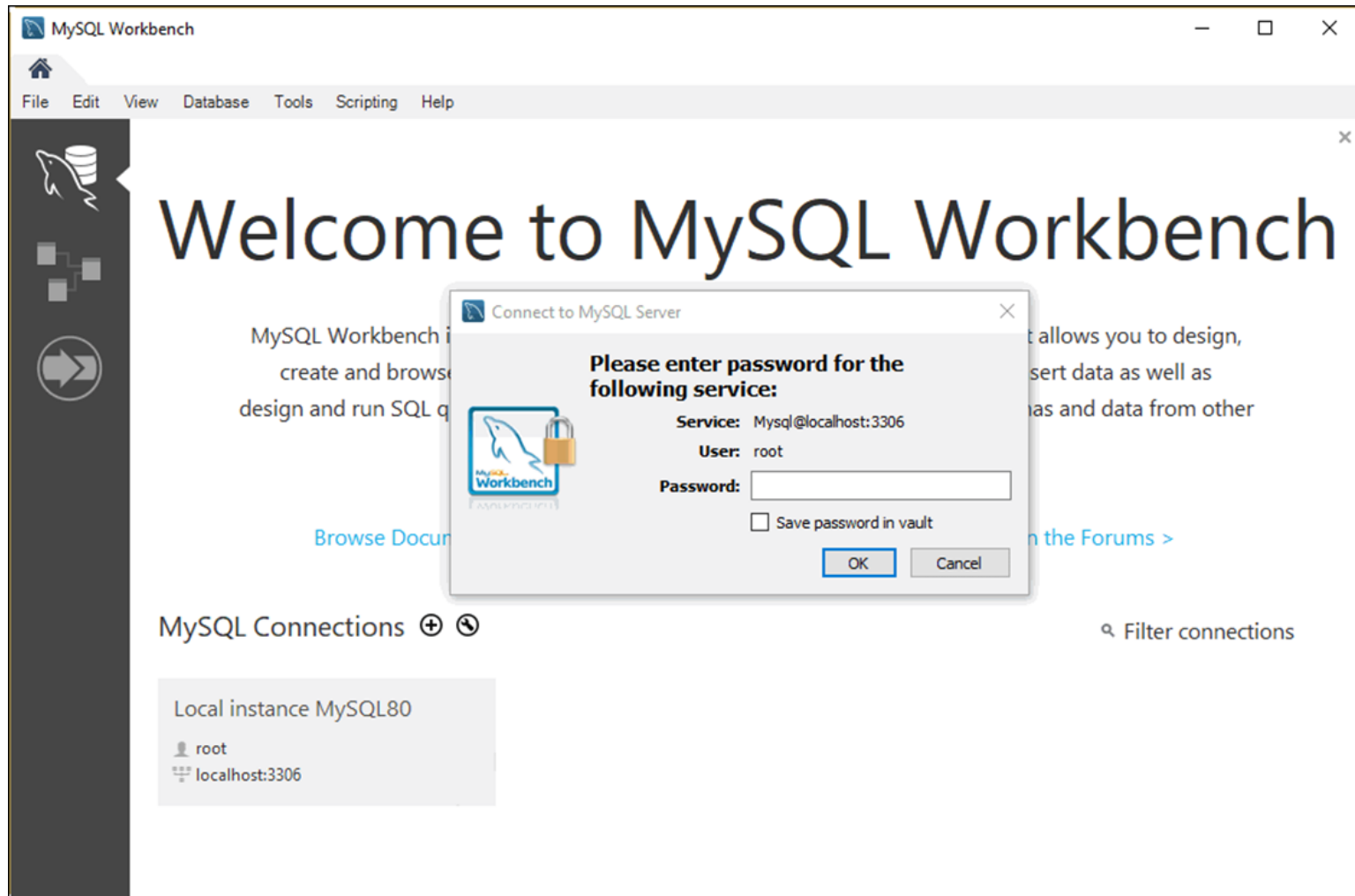
Knowledge

1. Briefly describe the function of each of these client tools: the MySQL Monitor, MySQL Workbench, and the MySQL Reference Manual.

The Home page of MySQL Workbench



The dialog box for opening database connections



How to connect as the root user

1. Click the stored connection named “Local instance MySQL80”.
2. Enter a password if prompted.

How to specify your own connection parameters

1. Right-click the connection and select the Edit Connection item.
2. Enter the connection parameters and click the Close button.

How to create a new connection

1. Click the icon to the right of MySQL Connections.
2. Enter the connection parameters and click the OK button.

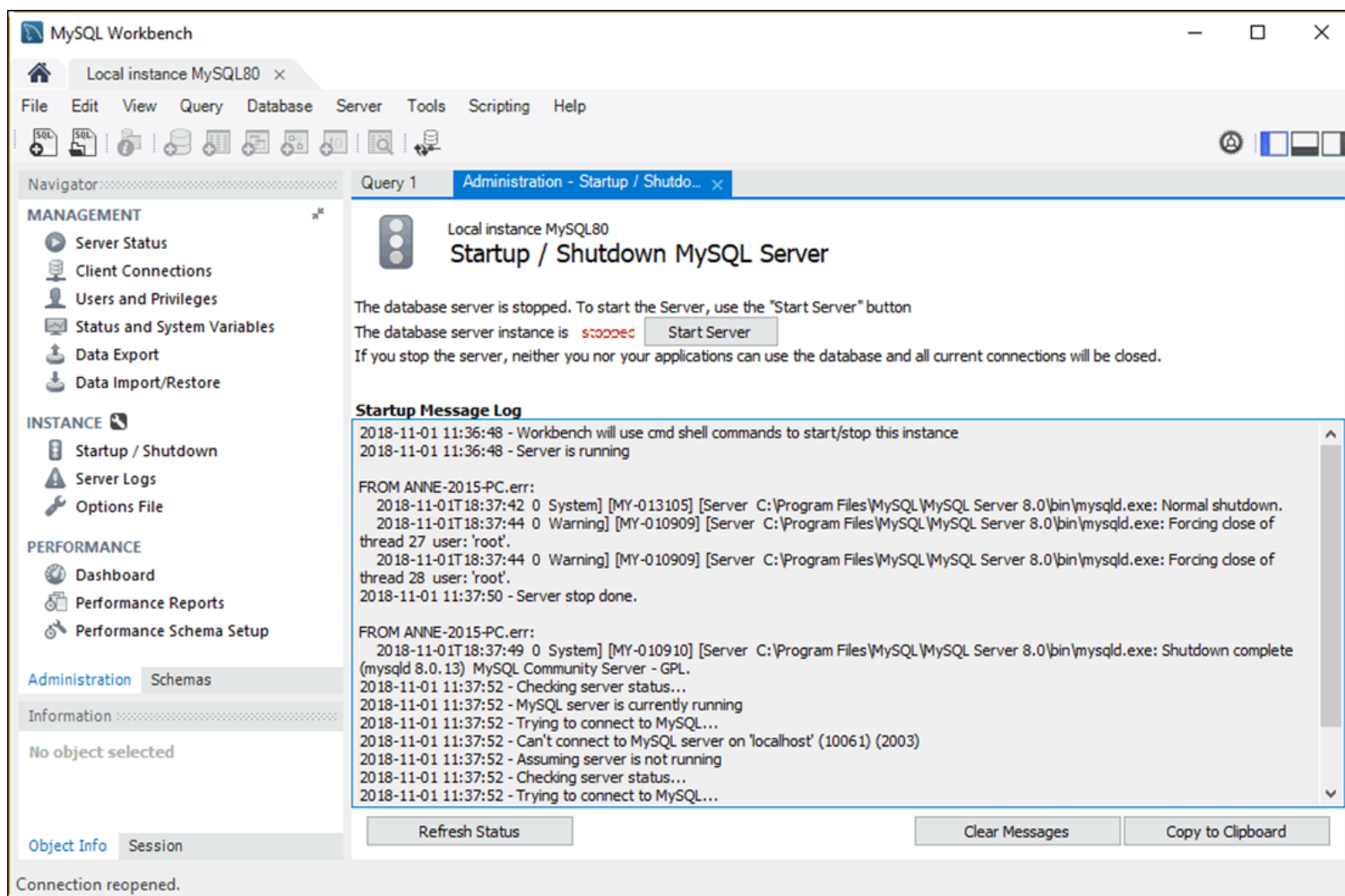
How to save a password

- Check the “Save password in vault” option when prompted for your password.

How to clear a password

1. Right-click the connection.
2. Select the Edit Connection item.
3. Click the Clear button for the password.
4. Click the Close button.

The Startup/Shutdown option of MySQL Workbench



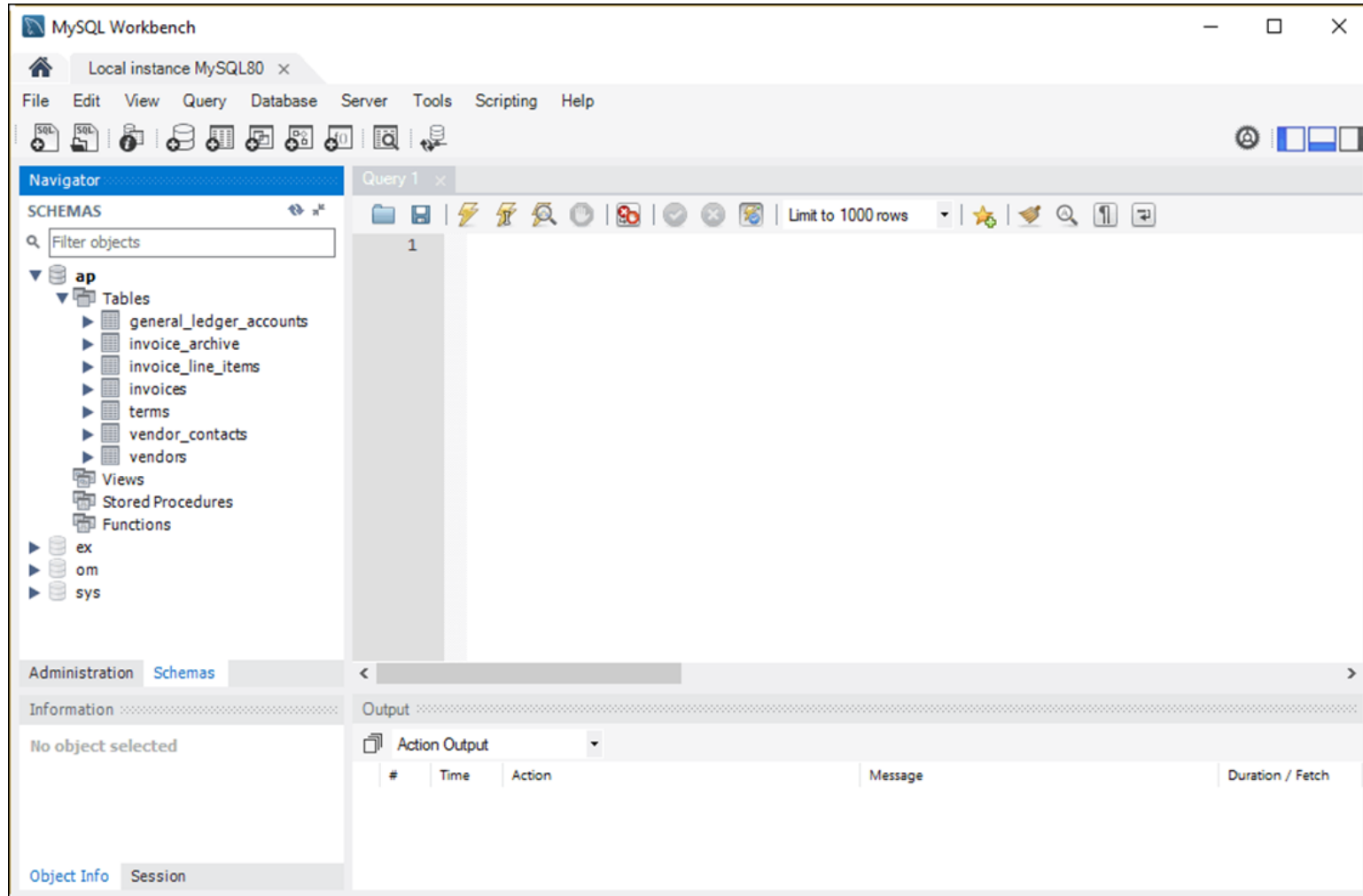
How to stop and start the database server

1. Display the Welcome tab of the MySQL Workbench Home page.
2. Click on the MySQL80 connection and enter a password if prompted.
3. In the Navigator window, select the Startup/Shutdown option.
4. Click the Stop Server button to stop the database server. Or, click the Start Server button to start it.

Note

- After you install MySQL, the database server usually starts automatically each time you start your computer.

The tables available for the AP database



The data for the Invoices table in a Result grid

The screenshot shows the MySQL Workbench interface. The Navigator on the left displays the 'ap' schema with the 'invoices' table selected. The Query Editor shows the query: `SELECT * FROM ap.invoices;`. The Result Grid displays the following data:

invoice_id	vendor_id	invoice_number	invoice_date	invoice_total	payment_total	credit_total	terms_id	invoice_date
1	122	989319-457	2018-04-08	3813.33	3813.33	0.00	3	2018-04-08
2	123	263253241	2018-04-10	40.20	40.20	0.00	3	2018-04-10
3	123	963253234	2018-04-13	138.75	138.75	0.00	3	2018-04-13
4	123	2-000-2993	2018-04-16	144.70	144.70	0.00	3	2018-04-16
5	123	963253251	2018-04-16	15.50	15.50	0.00	3	2018-04-16
6	123	963253261	2018-04-16	42.75	42.75	0.00	3	2018-04-16
7	123	963253237	2018-04-21	172.50	172.50	0.00	3	2018-04-21
8	89	125520-1	2018-04-24	95.00	95.00	0.00	1	2018-04-24
9	121	97/488	2018-04-24	601.95	601.95	0.00	3	2018-04-24

The Action Output pane at the bottom shows the execution of the query: `SELECT * FROM ap.invoices LIMIT 0, 1000`, resulting in 114 rows returned in 0.000 seconds.

How to view the data for a table

1. Right-click the table in the Schemas section of the Navigator window.
2. Select the Select Rows - Limit 1000 command to display it in a Result grid.

How to edit the data for a table

1. View the data.
2. Use the buttons at the top of the Result grid to insert, update, and delete rows.
3. Click the Apply button at the bottom of the tab to apply the changes.

The column definitions for the Vendors table

The screenshot shows the MySQL Workbench interface for editing the 'vendors' table. The main workspace displays the following table definition:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
vendor_id	INT(11)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	
vendor_name	VARCHAR(50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
vendor_address1	VARCHAR(50)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
vendor_address2	VARCHAR(50)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
vendor_city	VARCHAR(50)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
vendor_state	CHAR(2)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
vendor_zip_code	VARCHAR(20)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
vendor_phone	VARCHAR(50)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
vendor_contact_last_name	VARCHAR(50)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
vendor_contact_first_name	VARCHAR(50)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	NULL
default_terms_id	INT(11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
default_account_number	INT(11)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

The bottom pane shows the 'Columns' tab with the following details for the 'vendors' table:

- Columns:**
 - vendor_id: int(11), AI, PK
 - vendor_name: varchar
 - vendor_address1: varchar
 - vendor_address2: varchar
 - vendor_city: varchar
 - vendor_state: char(2)
 - vendor_zip_code: varchar
 - vendor_phone: varchar
 - vendor_contact_last_name: varchar

Additional options shown include Storage (Virtual/Stored), Primary Key, Not Null, Unique, Binary, Unsigned, Zero Fill, Auto Increment, and Generated. The 'Apply' and 'Revert' buttons are visible at the bottom right.

How to view the column definitions

1. Right-click the table name in the Navigator window and select the Alter Table command.
2. Select the Columns tab at the bottom of the window that's displayed.

How to edit the column definitions

1. View the column definitions.
2. Use the resulting window to add new columns and modify and delete existing columns.

A SELECT statement and its results

The screenshot shows the MySQL Workbench interface. The 'Query 1' window contains the following SQL statement:

```
1 SELECT vendor_name, vendor_city, vendor_state
2 FROM vendors
3 ORDER BY vendor_name
```

The 'Result Grid' displays the following data:

vendor_name	vendor_city	vendor_state
Abbey Office Furnishings	Fresno	CA
American Booksellers Assoc	Tarrytown	NY
American Express	Los Angeles	CA
ASC Signs	Fresno	CA
Ascom Hasler Mailing Systems	Shelton	CT
AT&T	Phoenix	AZ
Aztek Label	Anaheim	CA
Baker & Taylor Books	Charlotte	NC
Bertelsmann Industry Svcs. Inc	Valencia	CA
BFI Industries	Fresno	CA
Bill Jones	Sacramento	CA
Bill Marvin Electric Inc	Fresno	CA
Blanchard & Johnson Associates	Mission Viejo	CA
Blue Cross	Oxnard	CA
Blue Shield of California	Anaheim	CA
Boucher Communications Inc	Fort Washi...	PA
Cahners Publishing Company	The Lake	NV
Cal State Termite	Selma	CA
California Business Machines	Fresno	CA

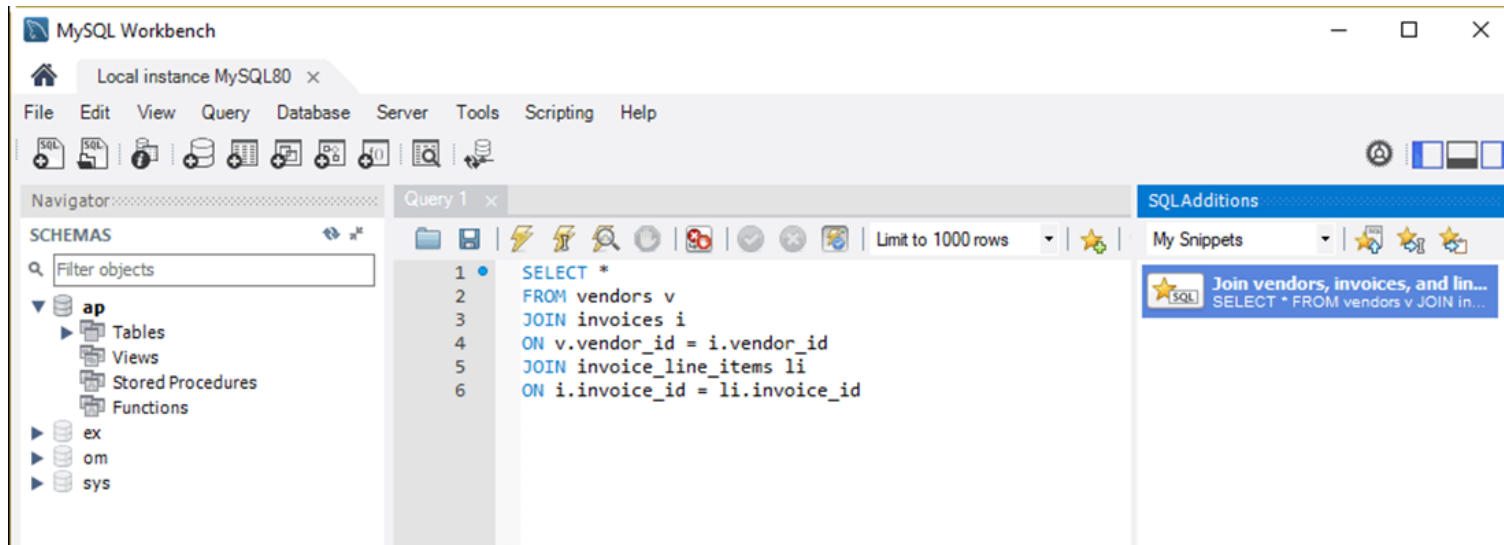
How to enter a SQL statement

1. Press Ctrl+T or click the Create New SQL Tab button in the SQL Editor toolbar to open a new code editor tab.
2. Double-click a database in the Schemas tab of the Navigator window to select it.
3. Type the SQL statement into the SQL editor.

How to execute a SQL statement

- Press Ctrl+Enter or click the Execute Current Statement button in the SQL Editor toolbar.
- If the statement retrieves data, the data is displayed in a Result grid.

The SQL Additions tab with a snippet created by a user



How to use a snippet

1. To display any category of snippets, select the category from the drop-down list at the top of the Snippets tab.
2. Select the snippet and then click the Insert Snippet button at the top of the Snippets tab.
3. Edit the snippet code so it's appropriate for your SQL statement.

How to replace code with a snippet

1. Select the code.
2. Select the snippet you want to replace the code with.
3. Click the Replace Current Text button.

How to create your own snippet

1. Enter the code for the snippet into a SQL editor tab.
2. Select the category where you want to save the snippet.
3. Click the Save Snippet button in the SQL Editor toolbar, and enter a name for the snippet.

How to delete a snippet

1. Right-click the snippet in the Snippets tab.
2. Select the Delete Snippet item.

How to handle syntax errors

The screenshot shows the MySQL Workbench interface. The 'Schemas' pane on the left shows the 'ap' database selected, with the 'vendors' table highlighted. The 'Query 1' editor contains the following SQL code:

```
1 SELECT vendor_name, vendor_city, vendor_state
2 FROM vendor
3 ORDER BY vendor_name
```

The 'Output' pane at the bottom shows an error message:

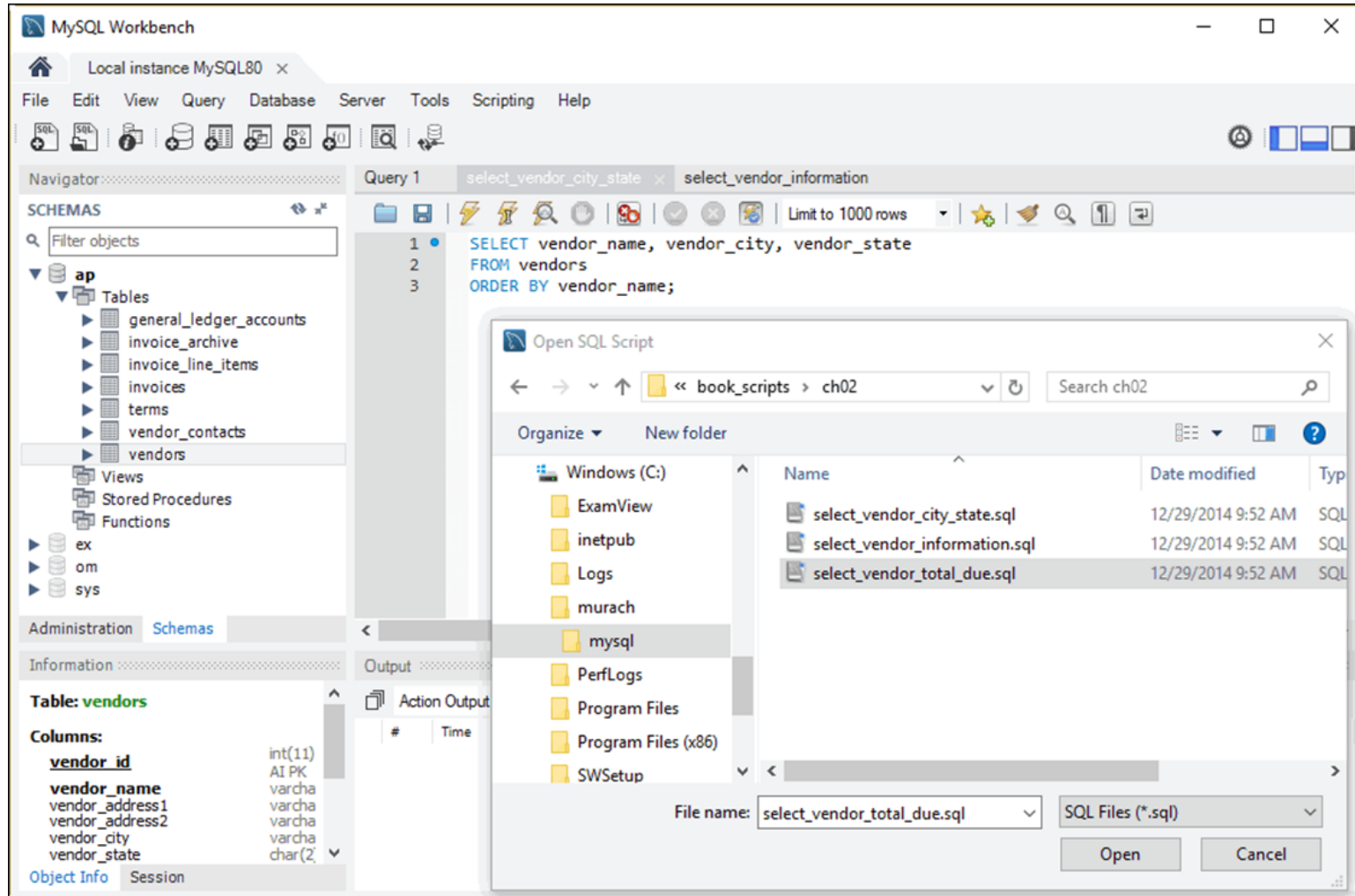
#	Time	Action	Message	Duration / Fetch
1	12:19:45	SELECT vendor_name, vendor_city, vendor_stat...	Error Code: 1146. Table 'ap.vendor' doesn't exist	0.000 sec

The error message indicates that the table 'ap.vendor' does not exist, which is a syntax error because the table name is misspelled as 'vendor' instead of 'vendors'.

Common causes of errors

- Having the wrong database selected
- Misspelling the name of a table or column
- Misspelling a keyword
- Omitting the closing quotation mark for a character string

The Open SQL Script dialog box



How to open a SQL script

1. Click the Open SQL Script File button in the SQL Editor toolbar or press the Ctrl+Shift+O keys.
2. Use the Open SQL Script dialog box to locate and open the SQL script.

How to switch between open files

- Select the appropriate tab.

How to cut, copy, and paste code

- Use the standard techniques.

How to save a new SQL script

1. Click the Save button in the SQL Editor toolbar or press Ctrl+S.
2. Use the Save SQL Script dialog box to specify a location and name for the file.

How to save a modified script to a new file

1. Press the Ctrl+Shift+S keys or select the File→Save Script As command.
2. Use the Save SQL Script dialog box to specify a location and name for the file.

A SQL script and its results

The screenshot shows the MySQL Workbench interface. The main window displays a SQL script in the Query Editor. The script consists of two queries. The first query selects the vendor name and city for vendor ID 34. The second query counts the number of invoices for vendor ID 34 and calculates the total due amount by summing invoice totals and subtracting payment and credit totals.

```
1 • SELECT vendor_name, vendor_city
2   FROM vendors
3   WHERE vendor_id = 34;
4
5 • SELECT COUNT(*) AS number_of_invoices,
6       SUM(invoice_total - payment_total - credit_total) AS total_due
7   FROM invoices
8   WHERE vendor_id = 34;
```

The results are displayed in the Result Grid. The first query returns one row with the vendor name 'IBM' and city 'San Francisco'. The second query returns one row with the number of invoices and the total due amount.

vendor_name	vendor_city
IBM	San Francisco

#	Time	Action	Message	Duration / Fetch
✓ 1	12:53:11	SELECT vendor_name, vendor_city FROM ven...	1 row(s) returned	0.000 sec / 0.000 sec
✓ 2	12:53:11	SELECT COUNT(*) AS number_of_invoices, ...	1 row(s) returned	0.000 sec / 0.000 sec

The left sidebar shows the Schemas pane with the 'ap' database selected. The 'vendors' table is highlighted. The bottom pane shows the 'Table: vendors' structure with columns: vendor_id (int(11), AI, PK), vendor_name (varchar), vendor_address1 (varchar), vendor_address2 (varchar), vendor_city (varchar), and vendor_state (char(2)).

How to run an entire script

- Press the Ctrl+Shift+Enter keys or click the Execute SQL Script button.

How to run on statement within a script

1. Move the insertion point into the statement you want to execute.
2. Press the Ctrl+Enter keys or click the Execute Current Statement button.

How to run two or more statements in a script

1. Select the statements you want to execute.
2. Press the Ctrl+Shift+Enter keys or click the Execute SQL Script button.

Notes

- The results of each statement that returns data are displayed in a separate Result grid.
- If a script contains more than one statement, you must code a semicolon at the end of each statement.

The web address for the MySQL 8.0 Reference Manual

<https://dev.mysql.com/doc/refman/8.0/en/>

A web page from the MySQL Reference Manual

The screenshot shows a web browser window displaying the MySQL 8.0 Reference Manual. The browser's address bar shows the URL `https://dev.mysql.com/doc/refman/8.0/en/manual-info.html`. The page features the MySQL logo and the tagline "The world's most popular open source database". Navigation links include "MYSQL.COM", "DOWNLOADS", "DOCUMENTATION" (highlighted with an orange underline), and "DEVELOPER ZONE". A secondary navigation bar lists "MySQL Server", "MySQL Enterprise", "Workbench", "InnoDB Cluster", "MySQL NDB Cluster", "Connectors", and "More".

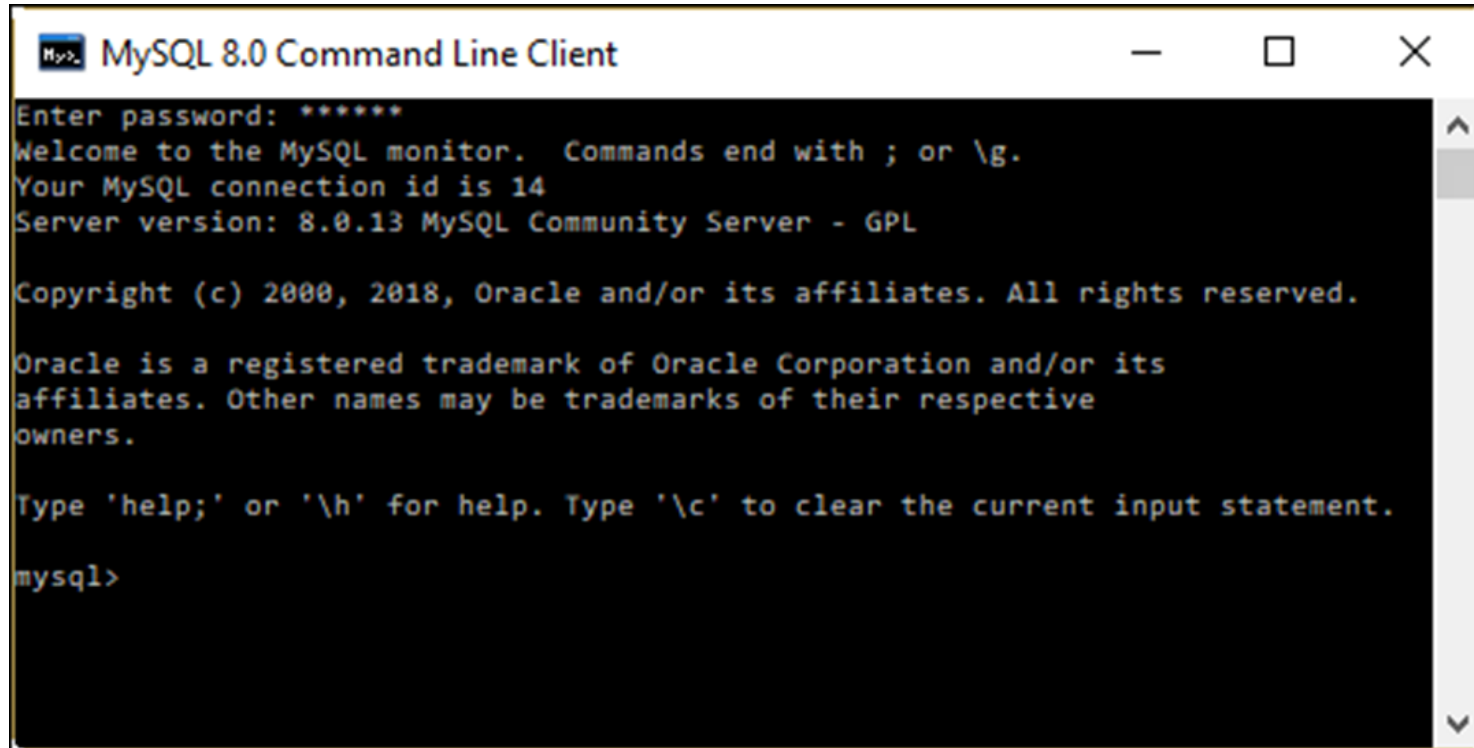
The main content area is titled "MySQL 8.0 Reference Manual / General Information / About This Manual" and includes a "version 8.0" dropdown menu. The section heading is "1.1 About This Manual". The text explains that this is the Reference Manual for the MySQL Database System, version 8.0, through release 8.0.15. It notes that differences between minor versions of MySQL 8.0 are indicated with release numbers (8.0.x). For license information, it refers to the [Legal Notices](#).

It also states that the manual is not intended for use with older versions of the MySQL software due to functional and other differences between MySQL 8.0 and previous versions. If using an earlier release, it refers to the appropriate manual, such as *MySQL 5.7 Reference Manual* for the 5.7 series.

Finally, it notes that because the manual serves as a reference, it does not provide general

The left sidebar contains a search box labeled "Search this Manual" and a "Documentation Home" link. Below that, it lists the "MySQL 8.0 Reference Manual" sections: "Preface and Legal Notices", "General Information" (expanded), "About This Manual" (selected), "Typographical and Syntax Conventions", "Overview of the MySQL Database Management System", "What Is New in MySQL 8.0", and "Server and Status Variables and Options Added, Deprecated, or Removed in MySQL 8.0".

The MySQL Command Line Client in Windows



```
MySQL 8.0 Command Line Client
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 14
Server version: 8.0.13 MySQL Community Server - GPL

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```

How to start the MySQL Command Line Client from the Windows Start menu

```
Start→All Programs→MySQL→MySQL Server 8.0→  
MySQL 8.0 Command Line Client
```

How to start the MySQL Command Line Client from the Windows Command Prompt window

```
cd \Program Files\MySQL\MySQL Server 8.0\bin  
mysql -u root -p
```

How to start the MySQL Command Line Client from a macOS Terminal window

```
cd /usr/local/mysql/bin  
./mysql -u root -p
```

The syntax of the mysql command

```
mysql -h hostname -u username -p
```

Examples of the mysql command

```
mysql -u ap_tester -p
```

```
mysql -h localhost -u root -p
```

```
mysql -h murach.com -u ap_tester -p
```

How to exit the MySQL Command Line Client

```
mysql>exit;
```


How to list the names of all databases managed by the server

```
mysql> show databases;  
+-----+  
| Database |  
+-----+  
| ap       |  
| ex       |  
| information_schema |  
| mysql    |  
| om       |  
| performance_schema |  
| sys      |  
+-----+  
7 rows in set (0.00 sec)
```

How to select a database for use

```
mysql> use ap;  
Database changed
```

How to select data from a database

```
mysql> select vendor_name from vendors limit 5;  
+-----+  
| vendor_name |  
+-----+  
| Abbey Office Furnishings |  
| American Booksellers Assoc |  
| American Express |  
| ASC Signs |  
| Ascom Hasler Mailing Systems |  
+-----+  
5 rows in set (0.00 sec)
```