

Chapter 2

How to use MySQL Workbench and other development tools

Objectives

Applied

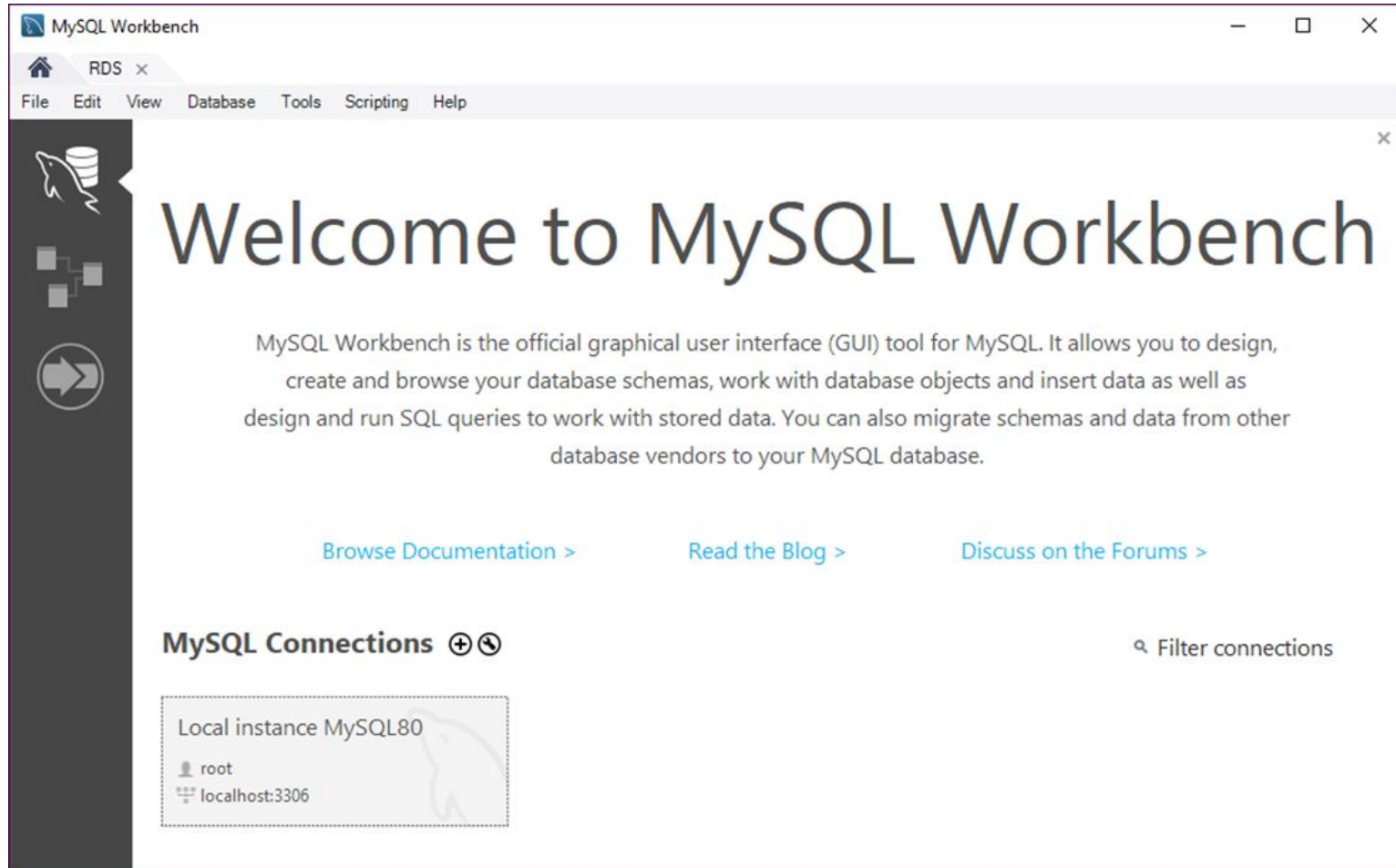
1. Start or stop the MySQL database server.
2. Use MySQL Workbench to do any of the following:
 - Create a database connection
 - Navigate through the objects of a database
 - View the column definitions for a table
 - View the data for a table
 - Edit the column definitions for a table
3. Use MySQL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

Objectives (continued)

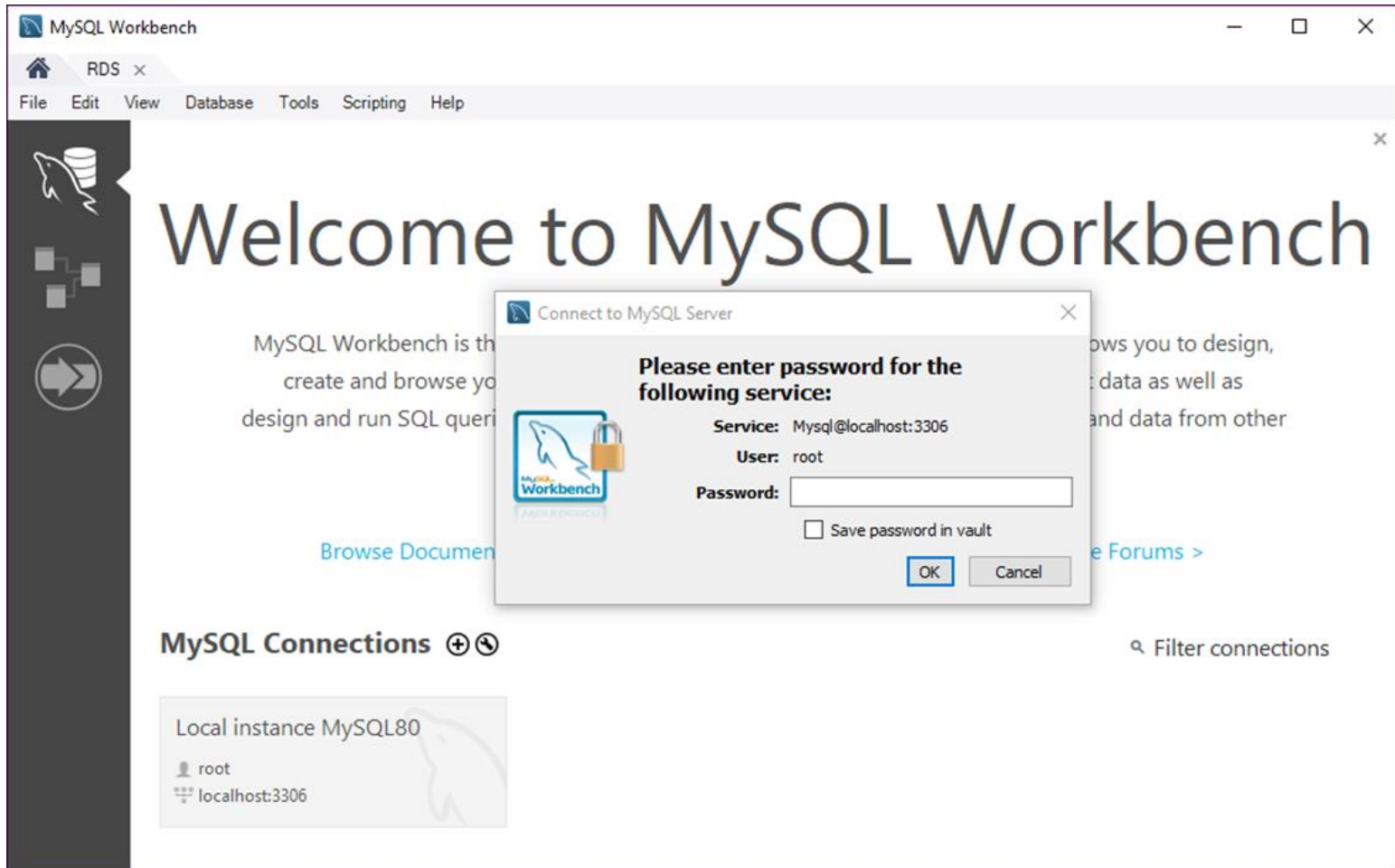
Knowledge

1. Describe the function of each of these client tools: the MySQL Command Line Client, 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 for the local instance.
2. Enter a password if prompted.

How to specify your own connection parameters

1. Right-click the connection and select Edit Connection.
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.

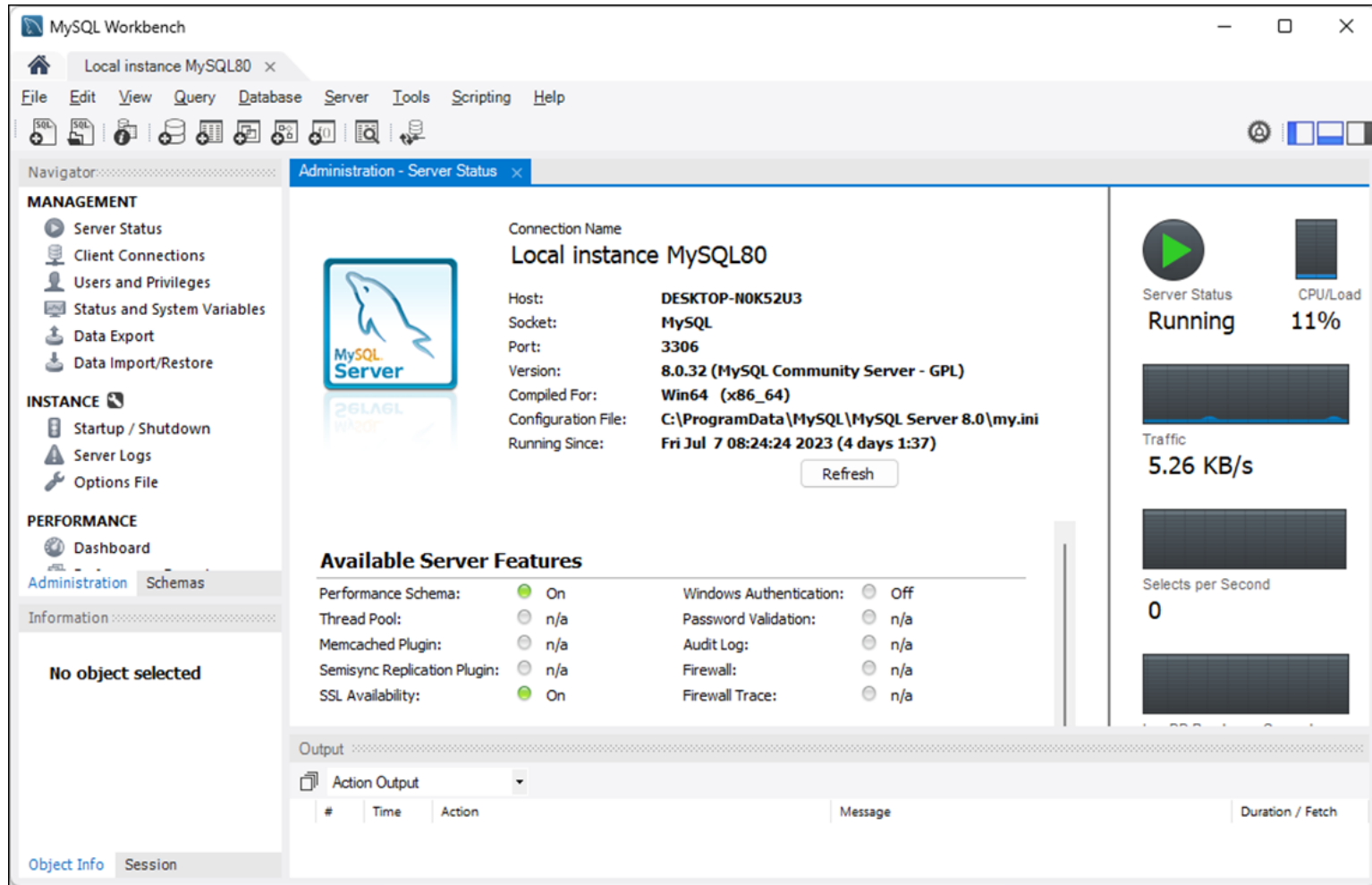
How to save a password

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

How to clear a password

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

The Server Status option of MySQL Workbench



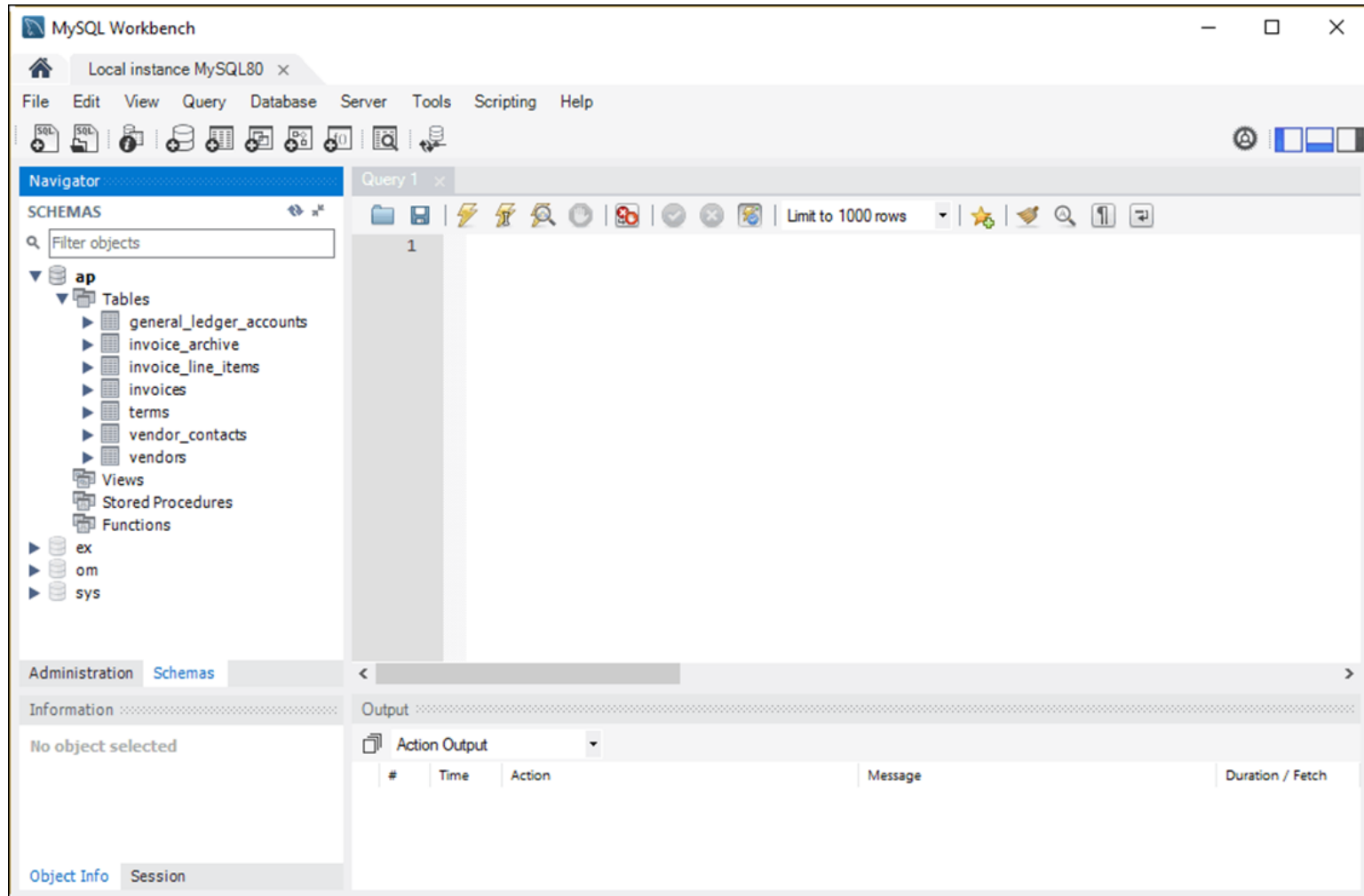
How to view the status of the database server

1. Connect to the local server and enter the password if prompted.
2. Display the Administration tab of the Navigator window.
3. Select the Server Status option from the Management category.

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 tables including 'invoices'. 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	2022-04-08	3813.33	3813.33	0.00	3	2022-05-01
2	123	263253241	2022-04-10	40.20	40.20	0.00	3	2022-05-11
3	123	963253234	2022-04-13	138.75	138.75	0.00	3	2022-05-11
4	123	2-000-2993	2022-04-16	144.70	144.70	0.00	3	2022-05-11
5	123	963253251	2022-04-16	15.50	15.50	0.00	3	2022-05-11
6	123	963253261	2022-04-16	42.75	42.75	0.00	3	2022-05-11
7	123	963253237	2022-04-21	172.50	172.50	0.00	3	2022-05-2
8	89	125520-1	2022-04-24	95.00	95.00	0.00	1	2022-05-01
9	121	97/488	2022-04-24	601.95	601.95	0.00	3	2022-05-2

The Action Output pane at the bottom shows a successful execution of the query, returning 114 rows in 0.000 seconds.

How to view the data for a table

1. Right-click the table in the Navigator window.
2. Select Select Rows - Limit 1000 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 changes.

The column definitions for the Vendors table

MySQL Workbench interface showing the column definitions for the 'vendors' table in the 'ap' schema. The table is configured with the following columns:

Column Name	Datatype	PK	NN	UQ	B	UN	ZF	AI	G	Default/Expression
vendor_id	INT	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" 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	<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	<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 'vendor_id' column is highlighted as the primary key. The table is configured with the following settings:

- Table Name: vendors
- Schema: ap
- Charset/Collation: utf8mb4 / utf8mb4_0900_ai
- Engine: InnoDB

The 'Columns' tab is selected, showing the column definitions for the 'vendors' table. The 'vendor_id' column is highlighted as the primary key. The 'Columns' tab is selected, showing the column definitions for the 'vendors' table. The 'vendor_id' column is highlighted as the primary key.

How to view the column definitions

1. Right-click the table name in the Navigator window.
2. Select Alter Table.

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

The interface also shows the 'SCHEMAS' pane on the left with the 'vendors' table selected, and the 'Information' pane at the bottom showing the table's columns: vendor_id, vendor_name, vendor_address1, vendor_address2, vendor_city, and vendor_state.

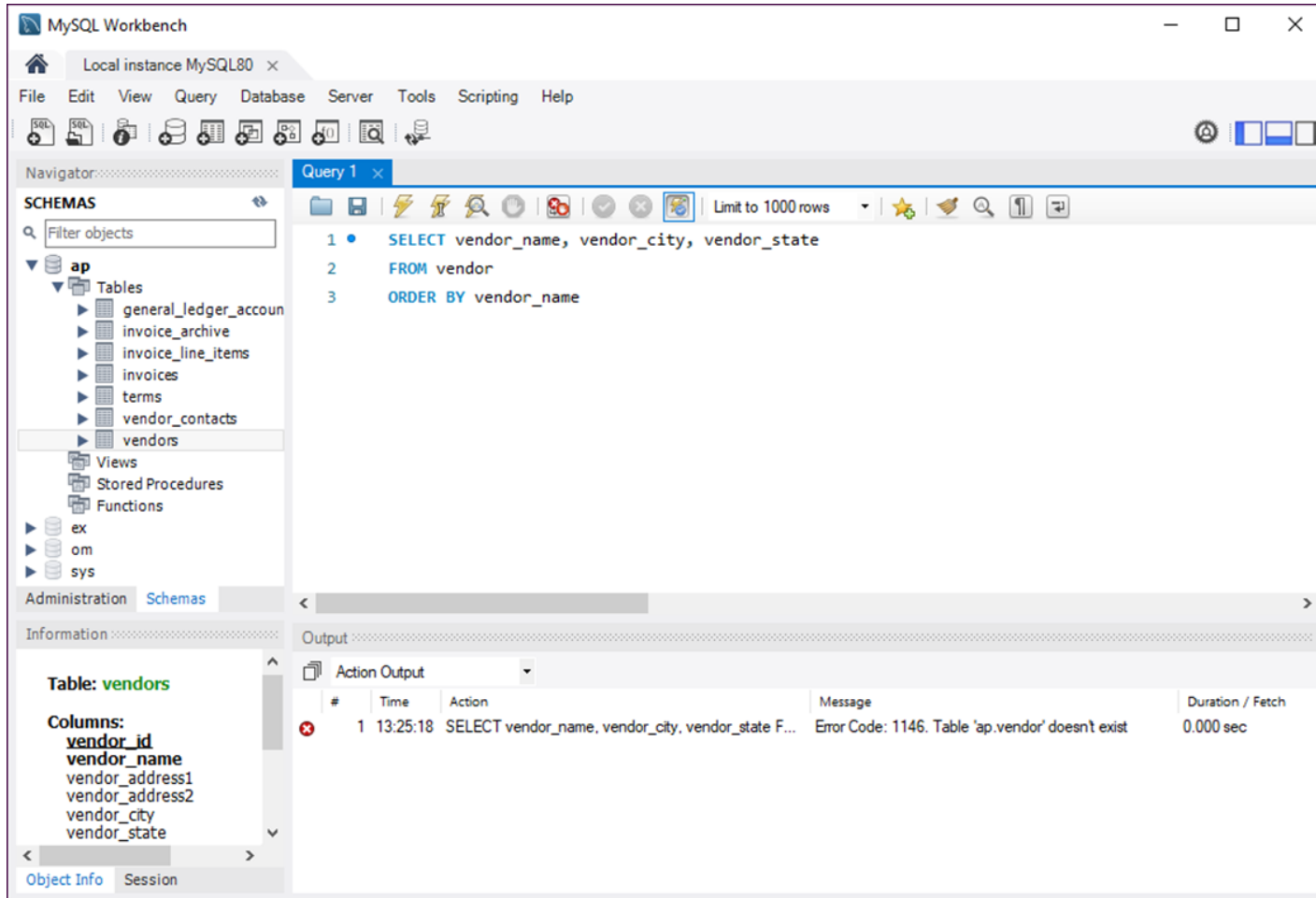
How to enter a SQL statement

1. Press Ctrl+T or click the Create New SQL Tab button in the SQL Editor toolbar to open a new SQL 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

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

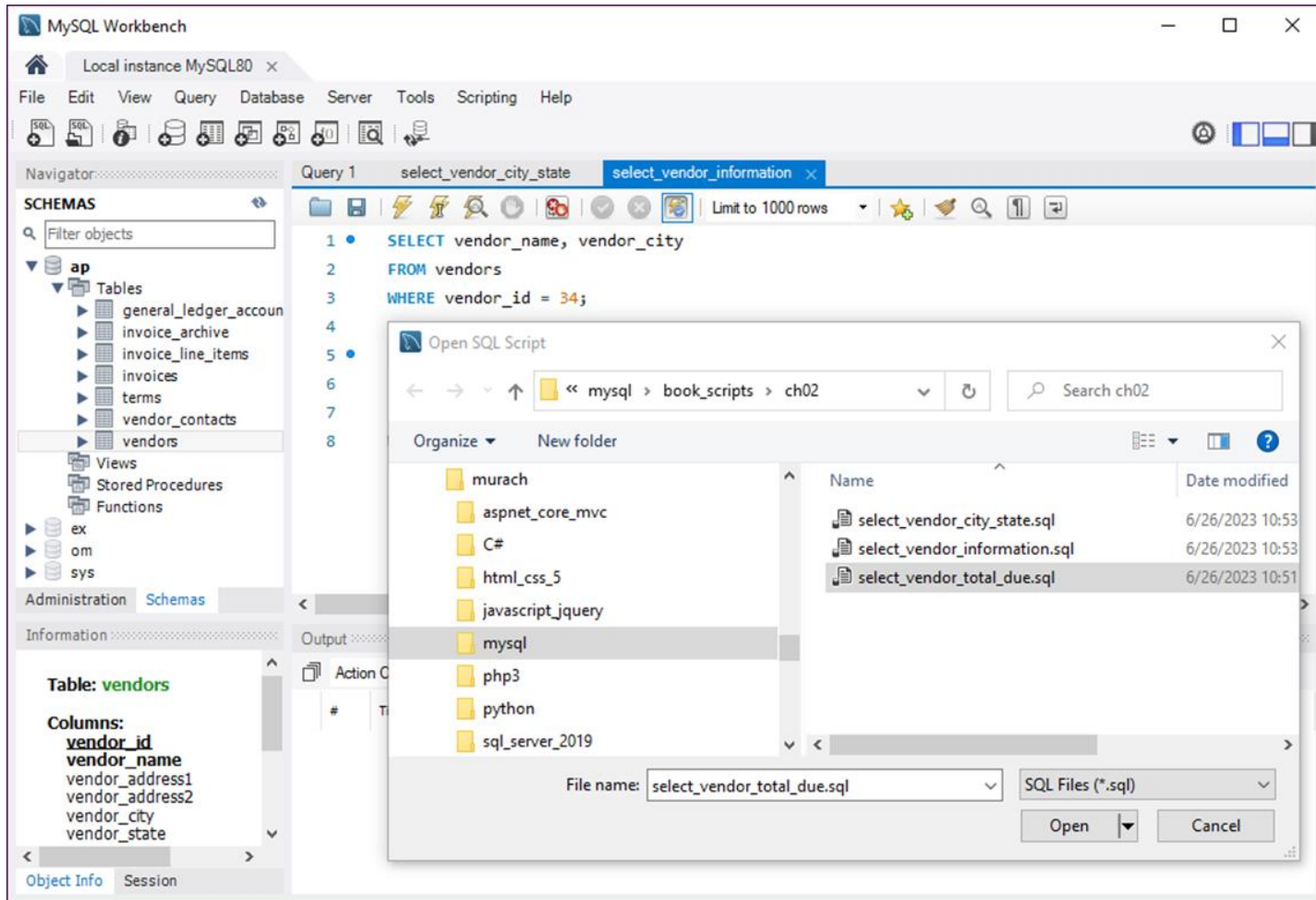
How to handle syntax errors



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 Ctrl+Shift+O.
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 that's displayed to specify a location and name for the file.

How to save a modified script to a new file

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

A SQL script and its results

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'Schemas' tree with the 'ap' schema expanded, showing tables like 'vendors'. The main window shows a query editor with the following SQL script:

```
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;
```

Below the query editor, the 'Result Grid' shows the results of the first query:

vendor_name	vendor_city
IBM	San Francisco

The 'Output' pane at the bottom shows the execution log:

#	Time	Action	Message	Duration / Fetch
✓ 1	15:18:29	SELECT vendor_name, vendor_city FROM vendors...	1 row(s) returned	0.000 sec / 0.000 sec
✓ 2	15:18:29	SELECT COUNT(*) AS number_of_invoices, SU...	1 row(s) returned	0.000 sec / 0.000 sec

How to run an entire script

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

How to run one statement within a script

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

How to run two or more statements within a script

1. Select the statements you want to execute.
2. Press Ctrl+Shift+Enter or click the Execute 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/>

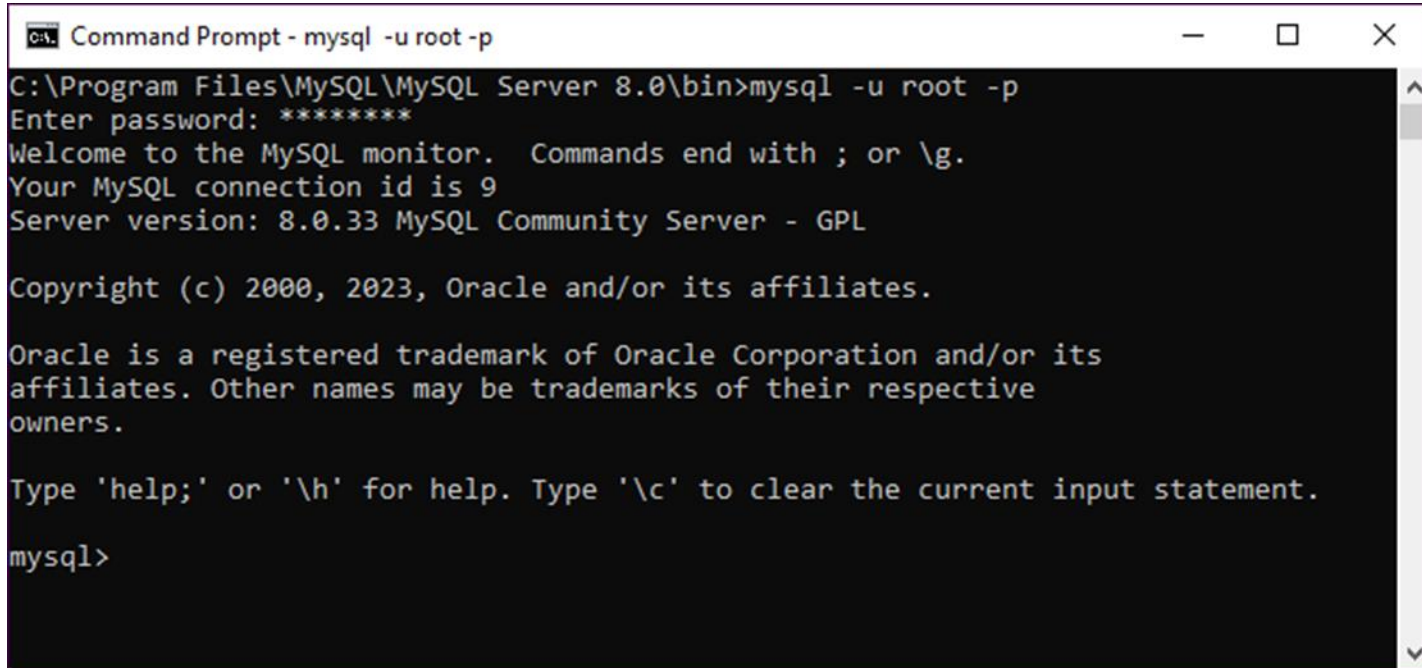
A web page from the MySQL Reference Manual

The screenshot shows a web browser window displaying the MySQL 8.0 Reference Manual. The browser's address bar shows the URL `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" (which is underlined), 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 8.0.34. It notes that differences between minor versions of MySQL 8.0 are indicated with release numbers (8.0.x) and refers to the Legal Notices for license information. It also states that the manual is not intended for use with older versions of the MySQL software due to functional and other differences, and advises users of earlier releases to refer to the appropriate manual, such as the *MySQL 5.7 Reference Manual*.

The left sidebar contains a search box labeled "Search this Manual" and a "Documentation Home" link. Below this, the "MySQL 8.0 Reference Manual" section is expanded to show a list of topics: "Preface and Legal Notices", "General Information" (which is expanded to show "About This Manual", "Overview of the MySQL Database Management System", "What Is New in MySQL 8.0", "Server and Status Variables and Options Added, Deprecated, or Removed in MySQL 8.0", and "How to Report Bugs or Problems"), and "How to Report Bugs or Problems".

The MySQL Command Line Client in Windows



```
CA: Command Prompt - mysql -u root -p
C:\Program Files\MySQL\MySQL Server 8.0\bin>mysql -u root -p
Enter password: *****
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.33 MySQL Community Server - GPL

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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 command line

For Windows

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

For macOS

```
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 from 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)
```