FileMaker® Pro 14

User's Guide

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Chapter 1
Introducing FileMaker Pro

FileMaker® Pro is the leading workgroup software for quickly creating and sharing solutions adapted to your business needs. Powerful features, broad platform support, and an easy-to-use interface make FileMaker Pro indispensable for anyone in business, government, and education who needs to effortlessly manage all their information on iPad, iPhone, Windows, OS X, and the web.

About this guide

This *User's Guide* contains an introduction to FileMaker Pro features and provides step-by-step instructions on the most common FileMaker Pro tasks. You will need to refer to FileMaker Pro Help for details and for information on more advanced product features.

To send your feedback on this guide, see http://www.filemaker.com/company/documentation_feedback.html.

Working with FileMaker Pro

FileMaker provides several ways to help you use FileMaker Pro.

FileMaker Pro documentation

To find documentation for FileMaker Pro and other FileMaker products:

- In FileMaker Pro, choose **Help** menu > **Product Documentation**.
- To learn about, view, or download additional FileMaker documentation, visit http://www.filemaker.com/documentation.

FileMaker Pro Help

FileMaker Pro Help provides comprehensive step-by-step instructions on FileMaker Pro features. You can open Help from the Help menu in FileMaker Pro.

There are three ways to access Help:

- Browse the Help table of contents to locate topics by subject.
- Search for particular topics by entering keywords.
- Get information about the currently displayed dialog box by pressing F1 (Windows) or Command-? (OS X). Some dialog boxes display a ⬚ (Windows) or ⬚ (OS X) button or a **Learn More** link, which you can also use for getting information about the dialog box.

To print a Help topic:

- Windows: In the FileMaker Pro Help window, click **Print**.
- OS X: In the FileMaker Pro Help window, click ⬚ or ⬚ , then choose **Print**.

Getting Started tour

You can explore FileMaker Pro through the interactive Getting Started tour. Practice creating, modifying, and deleting records; and learn about searching for data values and sorting records, displaying data in charts and reports, and importing and exporting data between files. You'll also get to know the rich features FileMaker Pro provides for creating your own custom solutions.

To access the tour, choose **Help** menu > **Product Documentation** > **Getting Started Tour**.

Starter Solutions

FileMaker Pro includes Starter Solutions—pre-designed, customizable solution files for business, education, and personal purposes—that you can use to quickly get started designing your FileMaker Pro solutions. Starter Solutions take advantage of the best new FileMaker Pro features. Whenever you start creating solutions, check the list of Starter Solutions to see if one is available that suits your needs.

You can access Starter Solutions when you open files (see "Creating a file using a Starter Solution" on page 41).

You can find more information, tips, and solution ideas on the FileMaker website at http://www.filemaker.com.

Suggested reading

Here are some suggestions for using the documentation to help you learn how to do specific tasks in FileMaker Pro.

Type of user	Suggested reading
Data entry person	Chapter 2, "Using FileMaker Pro," in this guide
Small business owner or educator who creates a basic solution to start, then improves it over time	Chapter 3, "Designing and creating solutions," in this guide. As features are added to the solution, refer to Help.
Database administrator	• All chapters in this guide • Help, for information on advanced topics • *FileMaker ODBC and JDBC Guide* and *FileMaker SQL Reference*
New FileMaker Pro user	• *Installation and New Features Guide for FileMaker Pro and FileMaker Pro Advanced* • All chapters in this guide
User upgrading from a previous version	• *Installation and New Features Guide for FileMaker Pro and FileMaker Pro Advanced* • Help, for information on converting files from FileMaker Pro 11 and earlier

FileMaker Pro overview

With FileMaker Pro you create solutions—one or more files containing database tables, layouts, scripts, and associated data that together solve one or more specific problems, such as tracking customers or invoices.

You can create a simple solution consisting of just one table, such as for customer information, or you can create a complex solution with relationships and multiple tables. For example, a complex solution relates two tables based on a single common value, such as a serial number or an ID number.

A solution consisting of one table

Portal

**A solution consisting of multiple tables, with a
portal to display records from a related table**

You can organize your solutions as a single table in a single file, as multiple tables in a single file, or as multiple tables in multiple files.

You create solutions using FileMaker Pro on a Windows or Mac computer. Or use FileMaker Pro Advanced for additional development and customization tools. You can then work with your solution on a computer using FileMaker Pro, or run the solution on iPad or iPhone using the FileMaker Go app. To access your solution from a web browser, use FileMaker Server with FileMaker WebDirect™.

For more information, see chapter 3, "Designing and creating solutions."

Note   If your solution was developed using FileMaker Pro Advanced, you may see customized menus or tooltips for layout objects. For an overview of these features, see chapter 7, "Using FileMaker Pro Advanced."

Using layouts to display, enter, and print data

FileMaker Pro layouts determine how information is organized for viewing, printing, reporting, finding, and entering data. Layouts do not store your data—they just display it.

FileMaker Pro files can have many different layouts, which display data in a variety of ways. Within one file you can design separate layouts for entering data, reporting summaries, printing mailing labels, displaying data graphically in charts, working with a file in a web browser or on a touch device, and so on. You can change a layout's design without affecting the data or other layouts in the file. When you change the data in a field, the changes are reflected in the same field on all the layouts in the file.

In a layout, you choose, arrange, and modify fields and field labels; create reports; add buttons to initiate scripts; add graphics and text; and specify printing options.

Not all information needs to be stored in your FileMaker Pro file. For example, you can add a *web viewer* to display a web page on a layout, or use data that's stored externally in a *container field* on a layout. There are some restrictions for displaying web content in FileMaker Pro.

Choose different layout types in the New Layout/Report assistant. Use these different layout types for various purposes, like displaying a data entry screen on a computer or an iPad, or printing a totaled sales report or formatting data as mailing labels. You can customize each layout further by using the design tools that are available in Layout mode.
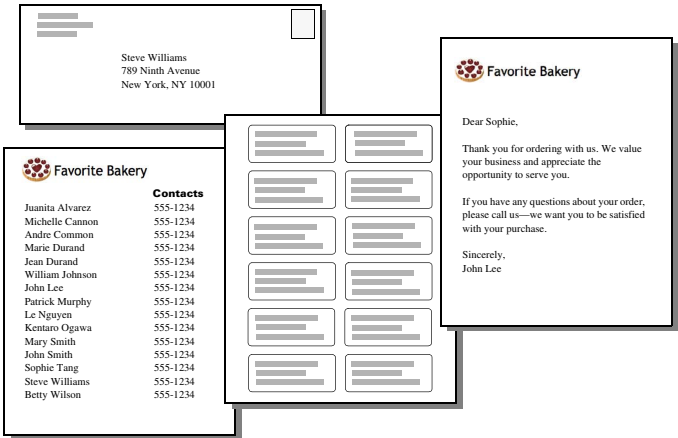
The same data can be arranged differently with multiple layouts

For more information, see "Creating layouts and reports" on page 54.

Finding, sorting, and replacing data

Features for finding, sorting, and replacing data allow you to manipulate your data in many ways.

You can find records that meet criteria you specify, such as records entered on a certain date or addresses in a particular city. You can open another window in order to perform different searches on the same data.

You can rearrange records in order to view or print them in a different sequence. For example, you can sort fields alphabetically, numerically, by date, or by a custom sort order.

Customer records sorted by last name

Customer ID	First Name	Last Name	Address1	Address2	City	State	Country
13	Juanita	Alvarez	147 Houston Avenue		New York	NY	USA
6	Michelle	Cannon	123 4th St SW		Edmonton		Canada
2	Andre	Common	147 White Avenue		Los Angeles	CA	USA
5	Marie	Durand	1 rue de la Poste		Paris		France
9	Jean	Durand	1001 Place du Monde		Montreal	Quebec	Canada
20	Juan	Garcia	Calle Real Manzana	Colonia Aquimero	Mexico Df		Mexico
19	Jens	Jensen	Bredgade 127		Copenhagen		Denmark
15	William	Johnson	852 Marsh Road		London		England
11	John	Lee	123 St John's Rd		Los Angeles	CA	USA
21	Gerard	LeFranc	Chez Pierre	456 Rue Eiffel	Paris		France
17	Ahmet	Mehmet	Bahar Caddesi 50:15	Etiler	Istanbul		Turkey
8	Patrick	Murphy	89 Lavenworth Place	Castleknock	Dublin		Ireland
10	Le	Nguyen	123 place de la mer		Paris		France
4	Kentaro	Ogawa	2-23-5 Imachi	Setagaya	Tokyo		Japan
22	Jutta	Schmidt	Grosse Elbestrasse		Hamburg		Germany
1	Mary	Smith	123 Elm St		New York	NY	USA
7	John	Smith	41 Mary St		Sydney		Australia
23	Sven	Svensson	Klammerdammsgatan		Stockholm		Sweden
12	Sophie	Tang	126 Deepwater Bay		Los Angeles	CA	USA
16	Julia	Vargas	Avenida Sevilla 87		Madrid		Spain
18	Annelies	Verhaag	Blauwburgstraat 33		Amsterdam		The Netherlands
24	Matti	Virtanen	Matintie 2		Helsinki		Finland
3	Steve	Williams	789 Ninth Avenue		New York	NY	USA
14	Betty	Wilson	456 Fifth Avenue		New York	NY	USA

100   Browse

You can search for and replace data across multiple fields, similar to the way you find and replace data in word processing applications. You can also save a found set of records as a snapshot link and send the link to another person.

For more information, see "Finding records" on page 28, "Sorting records" on page 32, and "Finding and replacing data" on page 32.

Protecting files

You can restrict what users see and do in a file by defining accounts and privilege sets. Accounts authenticate users who are attempting to open a protected file. Each account specifies an account name and (usually) a password. Any user that cannot specify valid account information won't be able to open a protected file. A privilege set specifies a level of access to a file. Each account is assigned a privilege set, which determines the level of access when someone opens a file using that account.

Extended privileges determine the data sharing options that are permitted by a privilege set, such as whether a privilege set permits users to open a shared file or view a solution in a web browser.

For more information about FileMaker Pro file security, see chapter 6, "Protecting files."

Automating tasks with scripts

You can create scripts that simplify common tasks in FileMaker Pro. A script is a series of steps that FileMaker Pro performs to complete a task. These tasks can be simple (setting page orientation so that reports print properly) or complex (preparing a customized mailing to targeted customers).

As an example, a script can create a thank you email for customers who have made a purchase during the past week. The script uses data stored in the solution to create an email message, customizing the message based on each customer's purchase history and contact information. The script then switches to Preview mode and pauses so you can preview the message. After you confirm that the message content is accurate, the script sends the message to customers. The whole task is started by clicking a button that you defined on the layout.

For example, you can use a script to:

- navigate a solution, by switching to another layout or mode when necessary
- work with data, by finding and sorting data based on criteria that you specified in the script
- access data, by importing required data from another table or data source

Scripts can incorporate conditional decisions (if-else statements) and perform repetitive tasks (loop statements). And, you can use script triggers to run scripts when particular events occur (such as when users enter a field, press a key, or add a new record to the file).

You create scripts in the Script Workspace window by selecting from a list of FileMaker Pro commands—called *script steps*—and then specifying options and arranging the steps in the order to perform the task. You can also view, edit, and manage all your scripts in this window.

Procedures for creating and managing scripts and a reference of all FileMaker Pro script steps, script triggers, and functions (which are used in calculations) are available in Help.

Sharing and exchanging data

A benefit of storing data in FileMaker Pro is sharing your data with others. You can share your data with other FileMaker Pro or FileMaker Go users on a network and import or export data from another file. In addition, you can use ODBC (Open Database Connectivity) and JDBC (Java Database Connectivity) to share FileMaker Pro files with ODBC- and JDBC-compliant applications, or you can access data from external data sources. If you have FileMaker Server, you can use FileMaker WebDirect to publish solutions hosted by FileMaker Server to share data over the web.

If your computer is connected to a network, you and other FileMaker Pro or FileMaker Go users can use the same FileMaker Pro file simultaneously. FileMaker Pro Network sharing supports the sharing of files with up to 5 concurrent users.

Note To support more users and web publishing technologies such as XML, PHP, and FileMaker WebDirect, you must use FileMaker Server.

You can set up a FileMaker Pro file to automatically update data imported from another application, such as Microsoft Excel. When you open a FileMaker Pro file, this *recurring import* occurs automatically the first time you view the layout containing the data from the external file. As you continue to work in the file, you can run a script to update data on the layout.

For more information about sharing and exchanging data, see chapter 5, "Sharing data."

Saving and sending data in other formats

FileMaker Pro lets you save data in different file formats, such as Microsoft Excel worksheets and PDF files, so you can give the files to users who do not have FileMaker Pro. You can automatically email the files after saving them. For more information, see "Saving and sending data in other formats" on page 109.

Chapter 2
Using FileMaker Pro

This chapter explains the basics of how to:

- open, close, and save files
- create records in a file
- add and edit data in fields
- find records using different criteria
- omit records from the found set
- find and replace data
- sort data
- print data, scripts, table and field information, and the relationships graph
- use scripts

See Help for detailed, comprehensive information and step-by-step procedures about using FileMaker Pro.

Note Some procedures refer to using a shortcut menu. To display a shortcut menu (context menu), right-click or Control-click an object or area to see a list of commands.

About fields and records

A FileMaker Pro solution is made up of one or more *database files*. Unlike an electronic spreadsheet, which is used to tabulate and calculate data stored in the cells of a rectangular table, a database file ties together the information (data) by a schema that describes the organization of database tables, their fields, and the relationships between the fields and tables. With FileMaker Pro, you can organize, update, sort, search through, calculate, and print the data in the fields and tables as needed.

While spreadsheets are best used for tasks such as maintaining a business ledger, where data needs to be recorded and calculated, databases are best for tasks such as inventory control, where you need to track consumption and losses and generate reports on inventory status over time. An inventory database can sort and report on inventory information in many ways, allowing you to analyze data by item type, by sales figures, by monthly consumption, and so on.

Your own address book or filing cabinet is an example of a simple database. With the address book and filing cabinet, you store similar pieces of information organized for easy retrieval. With a filing cabinet, you must choose a way to sort your data, for example, alphabetically by last name or by region. By storing contacts and addresses in FileMaker Pro, you can organize your information in many ways. You can sort your information by country, city, last name, or even sort by all three of these fields.
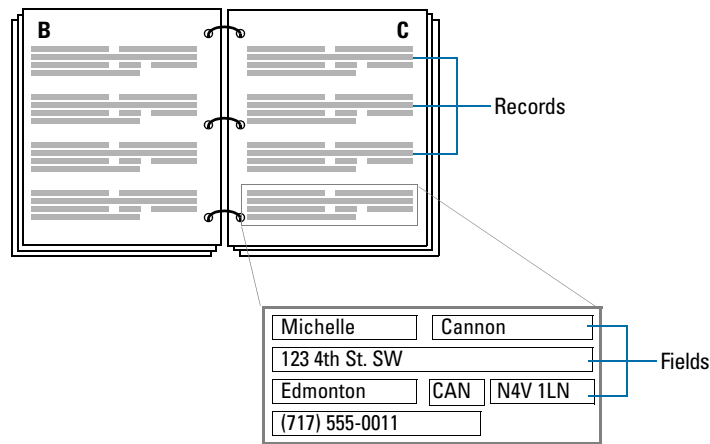
Your address book is like a database

An invoicing system is an example of a more complex database, with multiple related tables, multiple layouts, and calculated fields.

You can also view a subset of your data; for example, view only invoices for a particular month. A database doesn't just hold information—you use a database to organize and analyze information so that you understand its significance.

Fields are the basis of a database *table*. Fields are used to store, calculate, and display the data you enter into a *record*. Each piece of information in a record—like name, ID number, and telephone number—is stored in a field.

A database *table* contains one or more fields that hold similar information about one subject or activity. For example, the fields on a record in the Customers table contain address information for one customer. Tables also define the organization of records based on that table.

A database can consist of one file with one table, which might hold the names, addresses, and telephone and fax numbers of all your customers. A database can also consist of several files, each of which can contain one or more tables that, together, contain all the information about related topics (sometimes called a *database system*). Using the relational capabilities of FileMaker Pro, you can join information between files and tables to create a *relational database*.

For example, one table can show you which customers bought a particular item and a related table can show how much they paid.
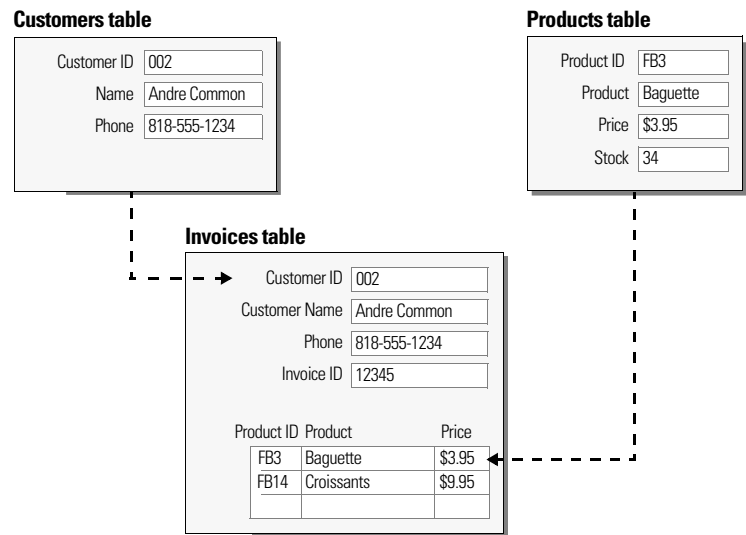
To enter data in a database table, you make a new record and enter values into the fields that belong to that record. Values can be typed into a field, imported from another application, or entered in many other ways.

FileMaker Pro also allows you to access and view data that is stored in non-FileMaker Pro files. For example, if you have access to data stored in an SQL database, you can display information from the external database and work with that data in your FileMaker Pro file.

Opening and closing files

To open a file if FileMaker Pro isn't running

Choose one of the following methods:

- Double-click the FileMaker Pro file.
- Drag the file to the FileMaker Pro application icon.
- Double-click the FileMaker Pro application icon and choose the file to open.

To open a file located on your computer if FileMaker Pro is already running

1. Choose **File** menu > **Open**.

Or, choose **File** menu > **Open Recent** or **File** menu > **Open Favorite**.

The Launch Center window opens. The My Solutions tab displays any files you've marked as favorites and those you've opened recently.

2. If you don't see the file you want, do any of the following.

To	Do this
Open a file marked as a favorite	Select a file under **Favorites**, then click **Open**.
Open a file that was recently opened	Select a file under **Recent**, then click **Open**. If **Recent** is not displayed, click ☆ in the Launch Center window toolbar.
	If no recent files are displayed, choose **Edit** menu (Windows) or **FileMaker Pro** menu (OS X) > **Preferences**, select **Show recently opened files**, enter a value, then click **OK**. (To remove the display of recent files, choose **File** menu > **Open Recent** > **Clear Recent Files**.)
Open a local file that is not displayed in the Launch Center window	Click **Browse**. In the Open File dialog box, choose the location, select the filename, then click **Open**.
Switch between displaying only favorite files and displaying all files	Click ☆ in the Launch Center window toolbar.
View files in a list or as tiles	To view in a list, click ☰. To view as tiles, click ⊞.
Search for a file	Type a few letters of the filename in the search box.

Note You can also double-click a file, or select multiple files and click **Open**. If the file was created using a version of FileMaker Pro earlier than 12, see Help.

3. If you're asked to enter an account name and password when the file opens, type them in the Open <*filename*> dialog box, then click **OK**.

To open a file that is being shared over a network

1. Choose **File** menu > **Open Remote**.

The Launch Center window opens to the Hosts tab. If hosts aren't displayed, click ▢.

Favorite hosts appear first in the list.

2. To see the files available from a host, click the host name.

To view files in a list, click ☰. To view files as tiles, click ⊞.

To add or edit hosts, see Help.

3. Select the file you want to open, then click **Open** (or double-click the filename).

Note   Alternatively, you can open remote files using the IP address of the host machine or the host machine's DNS name, if one has been defined.

To close a file or window

- Choose **File** menu > **Close**.

Opening multiple windows per file

You can open more than one window per file. This allows you to view the same layout in separate windows, or simultaneously view different layouts in the same file. You can perform find or sort operations independently in the different windows.

To open an additional window, choose **Window** menu > **New Window**. The new window initially displays the same layout, sort order, and found set as the previously active window.

Layout pop-up menu

The original window, in
Browse mode, in which
you can view the records

A second window, in
Find mode, in which you
can perform a different
search on the same
found set
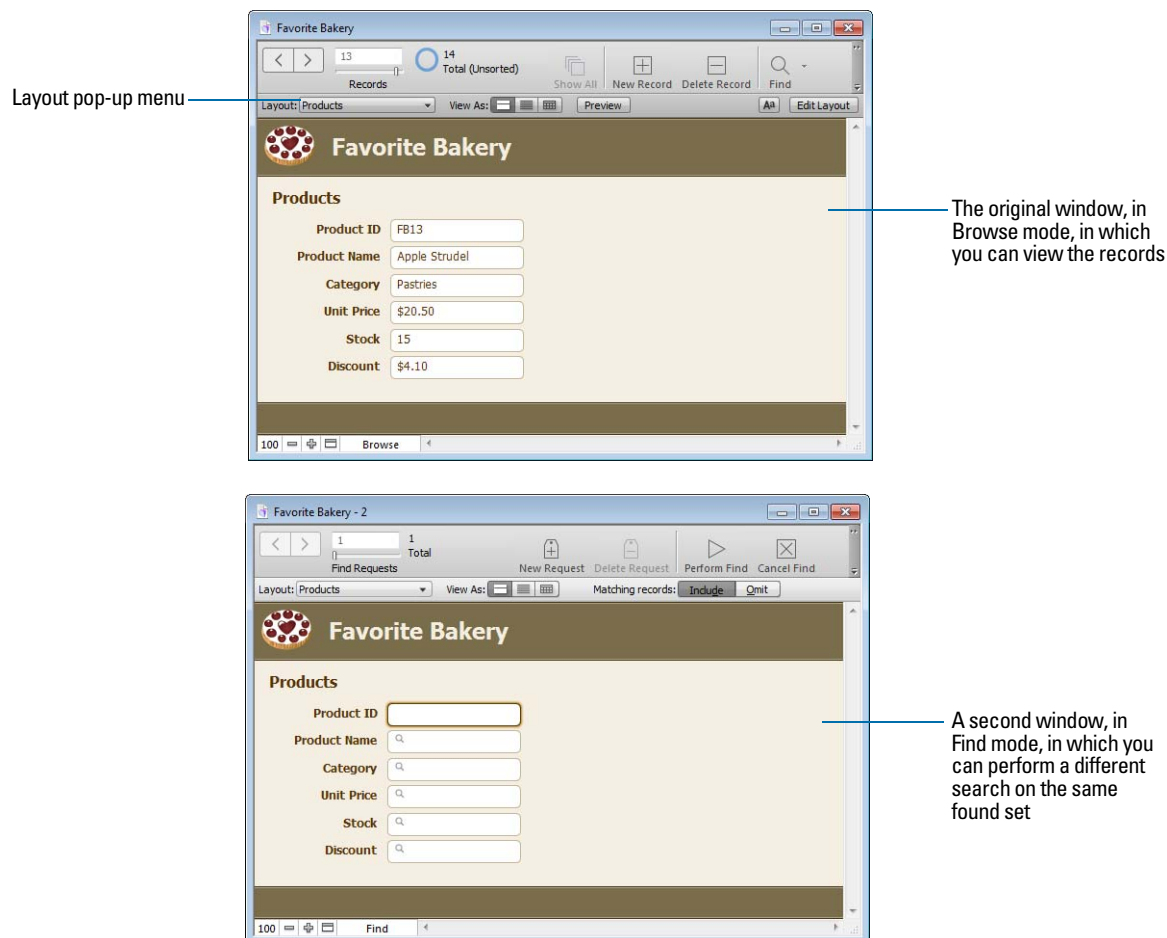
To view a different layout in the new window, choose a layout from the Layout pop-up menu in the layout bar, or choose **View** menu > **Go to Layout**. For information on finding records, see "Finding records" on page 28. For information on sorting records, see "Sorting records" on page 32.

Saving files

By default, FileMaker Pro automatically saves changes to your data as you work, so there is no Save command. For more control over when record data is saved, you can clear the **Save record changes automatically** option (in the Layout Setup dialog box) individually for each layout.

To save a copy of your file (for example, as a backup) or save a clone of your file with no data, see Help. To save a copy of your file in a non-FileMaker format, see "Saving and sending data in other formats" on page 109.

FileMaker Pro doesn't save changes to the state of a file if they are the only changes you make while the file is open.

About modes

You work with data in FileMaker Pro in Browse, Find, Layout, or Preview mode. You can choose a mode from the View menu or from the mode pop-up menu at the bottom of the document window.

Mode pop-up menu
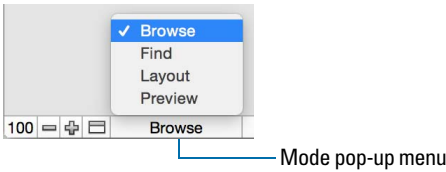
Use this mode	To
Browse mode	Work with the data in a file. You can add, view, change, sort, omit (hide), and delete records. Browse mode is where you'll do most of your work, such as data entry.
Find mode	Search for particular records that match a set of criteria. You can then work with this subset of your records, called the *found set*. After you find a group of records, FileMaker Pro returns to Browse mode so you can begin working with them.
Layout mode	Determine how information is presented on your screen or in printed reports, labels, and forms. Design layouts for specific tasks, like data entry or printing invoices or envelopes. Select and arrange fields and other objects to modify an existing layout or create new layouts.
Preview mode	See how data in forms or reports will look before you print. Preview mode is especially useful for viewing layouts with multiple columns (like mailing labels) and reports with summaries.

Using the status toolbar

The status toolbar provides quick access to many FileMaker Pro menu commands. In all modes, it includes navigation tools, customizable buttons, and a layout bar for working with layouts. In Layout mode, the status toolbar includes layout tools. Move the pointer over a button to see its description. You can also switch modes by clicking buttons in the status toolbar. The buttons in the status toolbar vary depending on which mode you're in.

Status toolbar in Browse mode (Windows)

Status toolbar in Browse mode (OS X)
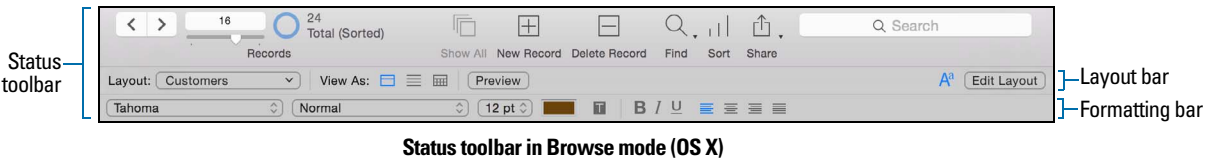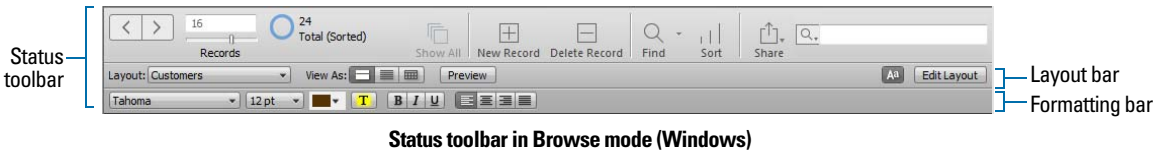
In Layout mode, you can also use the Inspector when you format and edit objects on a layout. For more information, see "Using the Inspector to format objects" on page 68.

Viewing records

FileMaker Pro provides three views of each layout: form, list, and table. When you change views, you temporarily change the way records display or print.

To view records	Do this in Browse mode or Find mode
Individually	Choose **View** menu > **View as Form**, or click **Form View** ▭ in the layout bar.
In a list	Choose **View** menu > **View as List**, or click **List View** ☰ in the layout bar.
In a spreadsheet-like table	Choose **View** menu > **View as Table**, or click **Table View** ⊞ in the layout bar. Each row displays a record, and each column displays a field.
	For information about working with data in a spreadsheet-like table, see "Working with data in Table View" on page 26.

The following illustration shows the same layout in three views.

Form View

Field labels

Current record

List View

Field labels

Current record

Table View

Current record

Field labels

A row is one record

Product ID	Product Name	Category	Unit Price	Stock	Discount	+
FB1	Donuts	Breads	$9.95	43	$1.99	
FB2	Chocolate Cake	Cakes	$22.50	23	$4.50	
FB3	Baguette	Breads	$3.95	34	$0.79	
FB4	Vanilla Cake	Cakes	$17.50	12	$3.50	
FB5	Banana Nut Cake	Cakes	$17.50	6	$3.50	
FB6	Poppyseed Cake	Cakes	$19.50	10	$3.90	
FB7	Fruitcake	Cakes	$15.50	5	$3.10	
FB8	Whole Grain Loaf	Breads	$6.95	50	$1.39	
FB9	Rye Loaf	Breads	$7.95	12	$1.59	
FB10	Fruit Tart	Pastries	$19.95	27	$3.99	
FB11	Focaccia	Breads	$6.95	31	$1.39	
FB12	Cinnamon Rolls	Pastries	$16.95	30	$3.39	
FB13	Apple Strudel	Pastries	$20.50	15	$4.10	
FB14	Croissants	Pastries	$9.95	22	$1.99	

Selecting the current record

In Browse mode, a table has one current (active or selected) record at a time for each window. For more information about moving through records, see "Moving through records" on page 21.

In this view	The current record is
Form View	The record that you're displaying. To select another record and make it the current record, move to the other record.
List View	The record that has a different fill from the other records. To select another record and make it the current record, click that record or use controls in the status toolbar. The current record can also be indicated by a solid vertical bar along the left side.
Table View	The record that's highlighted in the record margin at the left of the record. To select another record and make it the current record, click that record or use controls in the status toolbar.

To select a related record in a portal, select the portal row (click inside the row but outside any fields in the row).
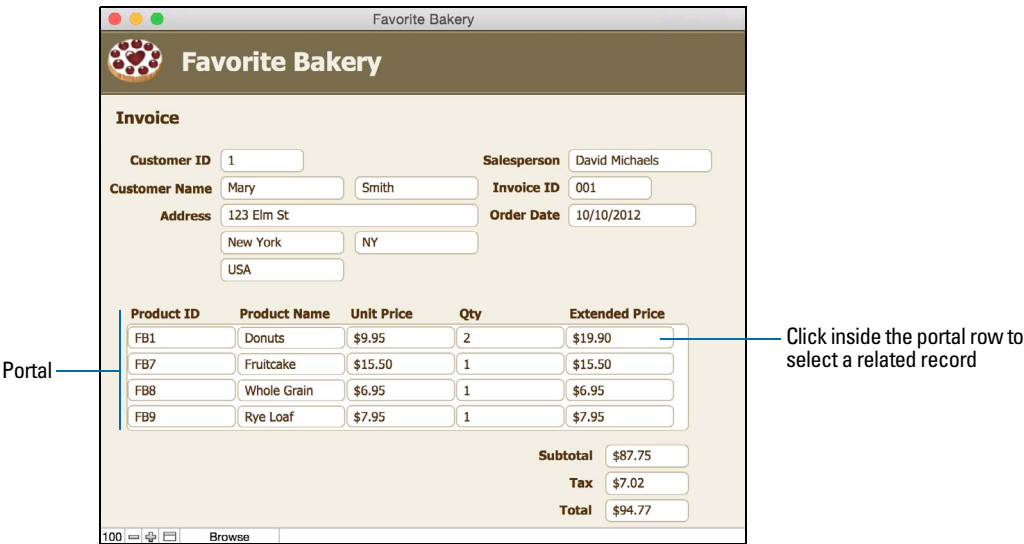
For information about related records and portals, see chapter 4, "Working with related tables and files."

Moving through records

To move from one record to another, use the forward and backward buttons in the status toolbar.

To move	Do this
To the next record in the current table	Click 〉 or choose **Records** menu > **Go to Record** > **Next**.
To the previous record in the current table	Click 〈 or choose **Records** menu > **Go to Record** > **Previous**.
Quickly to a specific record	▪ Click the current record number, type the record number, then press Enter (or Return. ▪ With the current record selected, press Esc, type the record number, then press Enter or Return. ▪ Choose **Records** menu > **Go to Record** > **Go To**, then type the number of the record.
Quickly through records	Drag the slider right or left to move forward or backward.
Through records in List View or Table View	Use the scroll bar on the right side of the window.
To a record with a unique value that you know	See "Finding records" on page 28.

Note   If your device supports gestures, you can use gestures to move through records, zoom in and out, scroll inside portals and web viewers, and move through slide panels. See Help.

Adding and duplicating records

When you add or duplicate records, FileMaker Pro stores new records at the end of the current table. In Browse mode, you see the new record after the current record, or after the last record in the found set (the set of records made active by a find request).

▪ If records are sorted, by default the new record appears in the correct position in the sort order when you commit the record.

▪ If records are unsorted, the new record appears after the last record in the found set. For more information, see "Sorting records" on page 32.

To	Do this in Browse mode
Add a new blank record	Click **New Record** in the status toolbar. You see a blank record with one field selected.
Quickly add a record with the same or similar data as an existing record	Select the record to duplicate. Then, choose **Records** menu > **Duplicate Record**.
Add or duplicate related records	See "Adding and duplicating related records" on page 23.

Note   If a file is locked or write-protected, or if you don't have access privileges to create records, FileMaker Pro will not add or duplicate records.

If the field is defined to automatically enter field values, you see those values entered in the new record. See "Setting options for fields" on page 50.

To enter or change values in the new record, see "Entering and changing data in fields" on page 25.

Adding and duplicating related records

If you're working with records in related tables, you can add records to a related table when you enter data in a record in the current table.

Note You can only add related records from the current table if the relationship is defined to allow the creation of related records. If a related table is in a write-protected file, or if you don't have access privileges to create records, FileMaker Pro will not add or duplicate records. See "Creating relationships" on page 94.

To	Do this in Browse mode
Create a record in the current table	Click **New Record** in the status toolbar.
Add a record to a related table	▪ If the related field is in a portal, type data into the field in the last (empty) row of the portal, then commit the record (for example, by clicking anywhere outside the record or selecting another record). ▪ If the related field isn't in a portal, type data into the field, then commit the record (for example, by clicking anywhere outside the record or selecting another record).
Duplicate a record that is displaying related data	Be sure no records in a portal are selected, then choose **Records** menu > **Duplicate Record**. Note Records in related tables are not duplicated.
Duplicate a related record in a portal	Select the record in the portal, then choose **Records** menu > **Duplicate Record**.

Portal with related records from the Line Items table

Type in the last row of the portal to add a related record to the Line Items table

Deleting records

When you delete a record, you *permanently* discard the data in all the fields in that record.

Important   You can't retrieve deleted data, and you can't undo the action of deleting records. Before you delete records, consider making a backup copy of your file.

If you're working in a relational database and the option to delete related records is selected in the Edit Relationship dialog box, FileMaker Pro deletes related records when you delete a record.

To delete	Do this in Browse mode
One record	Select the record to delete. In the status toolbar, click **Delete Record**, then click **Delete**.
A related record	Select a portal row in the current table by clicking inside the row but outside any fields in the row. In the status toolbar, click **Delete Record**, then click **Delete**. Note To delete related records, **Allow deletion of portal records** must be selected in the Portal Setup dialog box.
A group of records	Make sure the found set contains only the records you want to delete. (See "Finding records" on page 28.) Choose **Records** menu > **Delete Found Records**, then click **Delete All.**
All records in a table	Click **Show All** in the status toolbar, or choose **Records** menu > **Show All Records**. Choose **Records** menu > **Delete All Records**, then click **Delete All**.
All records in a file	Create a clone of the file with no records. See "Saving files" on page 17.

Entering data

Note   If a file is locked or write-protected, or if you don't have privileges to edit certain records or fields, you may not be able to modify data.

Selecting a field

To	Do this in Browse or Find mode
Select a field	Click in the field.
Select the contents of a field	Select the field, then choose **Edit** menu > **Select All**.
Move to the next field in the tab order	Press Tab. Note To set the Return or Enter key(s) to move to the next field, in Layout mode, select the fields. Click **Inspector** ⓘ in the layout bar, then click **Data**. In the Behavior area, for **Go to next object using**, select the keys to use for exiting fields. Buttons, popover buttons, tab controls, and slide controls can be included in the tab order. Fields on tab panels or slide panels that are not on the front-most panel are skipped.
Move to the previous field in the tab order	Press Shift-Tab (or Shift-Return or Shift-Enter, if enabled).
Move to items in a value list	Press the arrow keys.

Entering and changing data in fields

You can enter or import data up to the character limit for the field type. You can view and print only the data that fits within the field boundaries.

Note   For information about how FileMaker Pro uses system formats to display and sort dates, times, and numbers, see Help.

To	Click in the field in Browse mode, then
Enter data in a text field	Type the text. Note In a field set up to auto-complete, you see suggestions based on what you type.
Enter data in a number field	Type the values (from 10^{400} to 10^{-400}).
Enter data in a date field	Type one date on one line in the field. Type the day, month, and year as numbers (for example, 3/3/2014), separated by a nonnumeric character like – (minus) or / (forward slash). Note You cannot use a : (colon) as a date separator. Important If you enter dates with two-digit years, FileMaker Pro converts them to four-digit year dates using a conversion method described in Help. To avoid misinterpretations during conversion, always enter dates with four-digit years.
Enter the current date in a date, number, or text field	Choose **Insert** menu > **Current Date**. Select the date using the drop-down calendar, if available.
Enter data in a time field	Type the time of day (or time duration) as: ■ hours ■ hours and minutes ■ hours, minutes, and seconds ■ hours, minutes, seconds, and fractional seconds Separate hours, minutes, and seconds by a nonnumeric character like : (colon). Separate fractional seconds by a . (period). Type the time of day in 24- or 12-hour format, with or without AM or PM. (AM is assumed for a time less than 12:00.)
Enter the current time in a time, number, or text field	Choose **Insert** menu > **Current Time**.
Enter data in a timestamp field	Type the date and time (for example, 10/10/2014 3:15:05 PM). Type the day, month, and four-digit year as numbers, separated by a nonnumeric character like – (minus) or / (forward slash). Note You cannot use a : (colon) as a date separator. Then type the time of day as: ■ hours and minutes ■ hours, minutes, and seconds ■ hours, minutes, seconds, and fractional seconds ■ Type AM or PM if the time is not in 24-hour format Separate hours, minutes, and seconds by a nonnumeric character like : (colon).
Enter the current date and time in a timestamp field	Choose **Insert** menu > **Current Time**. Select the date using the drop-down calendar, if available.
Insert a tab character in a field	Click where to insert the tab. Press Ctrl+Tab (Windows) or Option-Tab (OS X).
Delete data from a field	Select the data, then press Backspace or Delete.
Insert an audio, video, image, PDF, or other type of file in a container field	See Help.

To	Click in the field in Browse mode, then
Add data to value lists (fields formatted as radio or option buttons, checkboxes, lists, or menus)	For information, see "Setting up fields to display checkbox sets and other controls on a layout" on page 74.
Edit, format, or check the spelling of text in a field or edit dictionaries	See Help.

Working with data in Table View

You can work with data in Table View to quickly create and change field definitions; add, modify, and delete records; sort records; create dynamic reports; and create quick charts. FileMaker Pro displays each record in a separate row, and each field in a separate column.

Column headings: each column displays one field from the current layout

Record margin

Active record
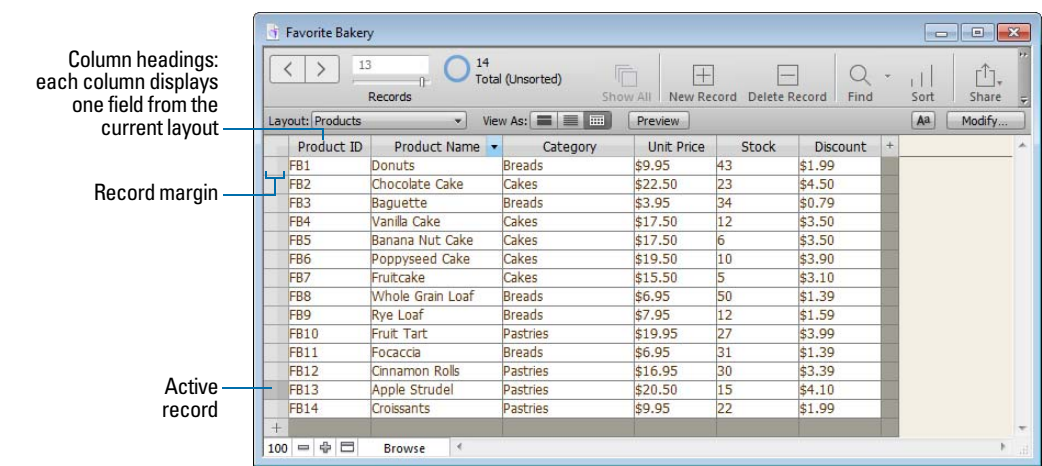
To work with data in Table View, click **Table View** in the layout bar when you're working in Browse mode.

Displaying data in Table View

You can change the display settings in Table View.

To	Do this
Reorder columns	Click a column heading and drag it to a new location.
Resize a column	Move the pointer to the edge of the column heading. When the pointer changes to a double arrow (✥), drag it to the desired size.
Set a precise column width	Select one or more columns, then right-click and choose **Table View** > **Set Column Width** from the shortcut menu. In the dialog box, type a width, choose units from the list, then click **OK**.
Change the color of the background	Right-click the left or right margin of a record, choose **Part Color** from the shortcut menu, then choose a color. The color of the row for adding new records and the column for adding new fields will be slightly darker than the main background color.
Display a different background color for alternating records	Right-click the left or right margin of a record, then choose a color from the **Alternate Color** shortcut menu.
Restore the default display settings	Right-click a column heading and choose **Table View** > **Reset** from the shortcut menu. Note Resetting Table View doesn't delete the fields and records.

Working with records in Table View

When you view records in a table, FileMaker Pro displays data in rows and columns. Each row displays a record, and each column displays a field.

Note You can set field options such as validation or indexing when you define a field, or at a later time. See "Setting options for fields" on page 50.

To	Do this in Browse mode
Add a new record	Click **+** in the left margin at the bottom of the table. A new row is added to the end of the table if the records have not been sorted or if **Keep records in sorted order** is cleared in the Sort Records dialog box.
Enter data in fields	Click in the field, then enter data in the field. See "Entering and changing data in fields" on page 25. Note FileMaker Pro saves changes to your data as you work. To see how your data looks in other views, click **Form View** ☐ or **List View** ☰ in the layout bar.
Duplicate a record	Right-click the left or right margin of the record to duplicate, then choose **Duplicate Record** from the shortcut menu.
Delete a record	Right-click the left or right margin of the record to delete, then choose **Delete Record** from the shortcut menu.
Copy the data in a record	Right-click the left or right margin of the record to copy, then choose **Copy Record** from the shortcut menu. You can paste the copied, tab-separated data into a field or into Microsoft Excel.
Sort records by one or more fields	Select a column heading and optionally Shift-click additional headings. Right-click one of the selected column headings and choose **Sort Ascending** or **Sort Descending**. A sort icon appears on the column headings indicating the sort setting (ascending or descending). If you selected multiple columns, the order in which columns were selected determines the sort order. You can also choose **Sort By Value List** and then select a value list from the submenu. For more information, see "Sorting records" on page 32.
Create a dynamic report	See Help. For example, you can create a quick report to group your data by a field, display subtotals for a field, or create subtotals for each group of data.
Create a quick chart	See Help. For example, you can quickly create a chart from Table View based on the data in the current field.
Save data as a Microsoft Excel file or Adobe PDF file, or save the current found set of records as a snapshot link	Right-click the left or right margin, then choose an option from the **Save/Send Records As** shortcut menu.
Send email messages based on record data	Right-click the left or right margin of the record, then choose **Send Mail** from the shortcut menu.

Finding records

To find particular records in your file, you can:

- perform a quick find in Browse mode
- make a find request in Find mode

Performing quick finds in Browse mode

If a layout is enabled for quick find in Browse mode, you can use the search box in Browse mode to search for data across multiple fields on the layout. Quick find is helpful if the data you are looking for might be in multiple fields or if you don't know which field contains the data.

When a layout is enabled for quick find, all fields that are supported for quick find (including merge fields) are set to be included in the search. Quick find does not search summary, container, or global fields. (To enable a layout for quick find, see "To configure and enable quick find" on page 29.)

Note While quick finds are an easy way to search for data, they can work slowly depending on the type of data in the file. For example, unstored calculations or related or remote data can slow progress, compared with data that's local or stored.

To perform a quick find

1. In Browse mode, type one or more words in the search box in the upper-right corner of the status toolbar.
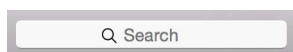
2. Press Enter or Return.

The search includes all the fields that are enabled for quick find on the layout. Your find request returns a found set of records. The highlighted area of the pie chart ○ in the status toolbar indicates the portion of the total records displayed.

Keep the following points in mind:

- The only find operator supported by quick find is the *match phrase* operator, which is double quotation marks (" ").
- If you type more than one word in the search box, FileMaker Pro searches for records that have all of the words you typed.

To view a list of recent quick finds

1. In Browse mode, click the down arrow in the search box.

2. Do one of the following:

  - Choose a search term from the search history list to perform a quick find for the term.
  - Choose **Clear Recent Searches** to remove the search history.

Note The list of recent quick finds is available only until you close the file.

To configure and enable quick find

If the selected layout doesn't show the quick find badges for supported fields in Layout mode, use the following steps.

1. In Layout mode, choose **View** menu > **Show** > **Quick Find**.

A small badge next to each field shows if the field has been enabled for quick find. If there is no quick find badge next to a field, the field is not searchable, either because it is not supported for quick find or because it is not set to be included in the search. A gray badge 🔍 indicates that the layout is disabled for quick find. A green badge 🔍 indicates that the field is searchable. A yellow badge 🔍 indicates that the field is searchable, but the search might take longer than fields with the green badge.

2. Select one or more fields.

3. Click **Inspector** ⓘ in the layout bar, then click **Data**.

4. In the Behavior area, select **Include field for Quick Find**.

5. To enable quick find, click **Layout Setup** ✎ in the layout bar. In the Layout Setup dialog box, select **Enable Quick Find**, then click **OK**.

Making find requests in Find mode

When you perform a find in Find mode, you type *criteria* (the value or values to find) into fields in a *find request*, which looks like a blank record. FileMaker Pro searches through all the records in a table, comparing the criteria you specify with the data in the table.

Records with data matching the criteria become the *found set*, which is the subset of records being browsed. Records that don't match are omitted. You can constrain (narrow) or extend (broaden) the found set in Find mode.

You can work with just the records in the found set. For example, you can view, edit, calculate summaries for, sort, print, delete, export, or replace data in these records. You can also open a new window in order to perform different find requests on the same data.

You can save the found set of records and email it as a snapshot link.

You cannot perform a find in summary fields, container fields, or fields defined with the global storage option.

Note In Find mode, a badge 🔍 indicates a searchable field.

To make a find request

1. In Find mode, from the Layout pop-up menu, select a layout that includes the fields that contain the data to search.

If necessary, you can change layouts and enter criteria on more than one layout.

2. In the find request, select a text, number, date, time, timestamp, or calculation field to use for finding, and then type a value in the field.

You can use the **Insert Operators** list in the layout bar to help you enter criteria. You can click **Omit** to exclude records matching a specific set of criteria.
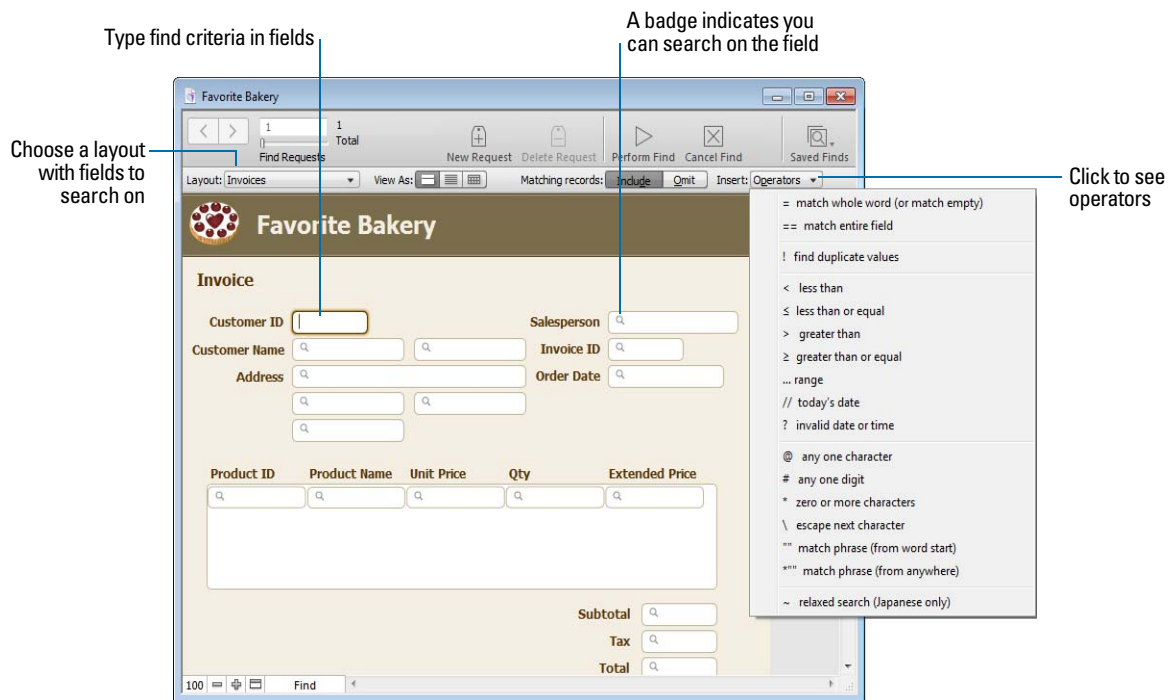
3. Click **Perform Find**.

Your find request returns a found set of records. The highlighted area of the pie chart ⭕ in the status toolbar indicates the portion of the total records displayed.

You can do the following during or after performing a find request:

To	Do this
Cancel a find operation before it is finished and leave the previous found set unchanged	Press Esc (Windows) or ⌘-period (OS X).
Show all records again	In Browse mode, choose **Records** menu > **Show All Records**. In Find mode, choose **Requests** menu > **Show All Records**. You don't need to choose **Show All Records** before performing finds. FileMaker Pro always searches all records in the tables you specify unless you have narrowed the existing found set.
Omit (hide) one or more found records	See "Hiding records from a found set and viewing hidden records" on page 32.
Open another window in order to perform different find requests on the same data	Choose **Window** menu > **New Window**.

Finding data in related fields

You can enter find criteria in related fields that are displayed in a portal or directly on a layout.

When you perform a find in a related field, FileMaker Pro displays all the records that have a related record matching the criteria you enter. For example, you have an invoice file that displays line items as related records in a portal. To find all invoices listing a computer, type `Computer` in the Item field in the portal. For information about related fields, see chapter 4, "Working with related tables and files."
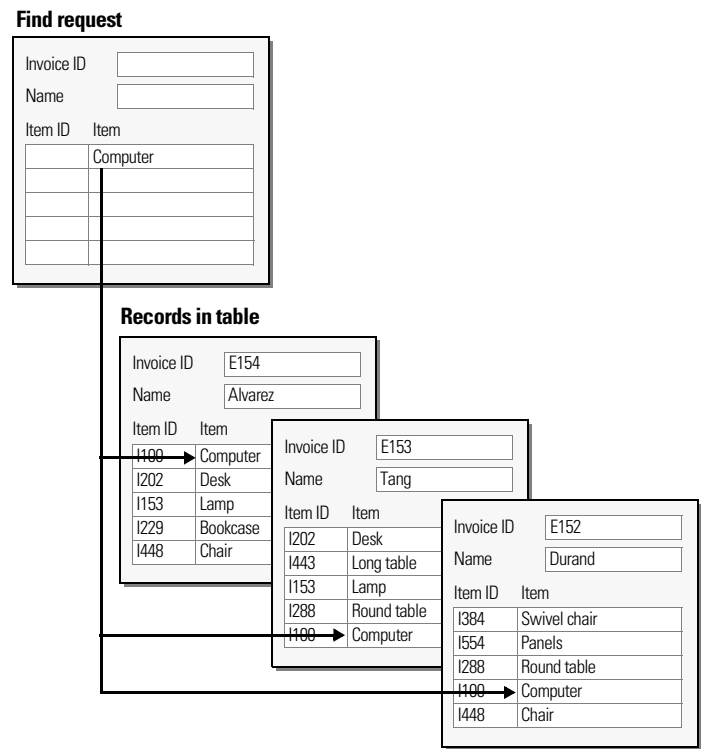
Viewing, repeating, or changing the last find

To view the most recent find criteria, choose **Records** menu > **Modify Last Find**. Then, to return to the found set, switch to Browse mode. To repeat the find, click **Find**. Or you can modify the find criteria, then click **Perform Find**.

Saving find requests

When you have a complex find request that you want to use regularly, you can save the request and retrieve it when you need it later. You can save and retrieve find requests without having to go to Find mode. FileMaker Pro automatically saves the last five finds you have performed so you can access them again. Once a find is saved, the saved find is also available to any network clients that share the account.

Deleting and reverting requests

To delete a request, go to the request, then click **Delete Request**.

To restore a request to the way it was when you last committed it, choose **Requests** menu > **Revert Request**. Requests are committed, for example, when you click out of all fields, go to a different layout or request, or perform a find.

Hiding records from a found set and viewing hidden records

All records that are not in the found set are omitted, or hidden. You can omit additional records from the found set without doing a new find.

Important   Omitted records are temporarily excluded from the found set. They still exist in the file.

To	Do this
Omit a specific record	Display or select the record to omit, then choose **Records** menu > **Omit**.
Omit a series of records	Display or select the first record in a number of consecutive records to omit, then choose **Records** menu > **Omit Multiple**. In the Omit Multiple dialog box, type the number of records to omit, then click **Omit.**
View the omitted set	Choose **Records** menu > **Show Omitted Only**.
Bring back all the records in the file	Choose **Records** menu (Browse mode) or **Requests** menu (Find mode) > **Show All Records**.

Finding and replacing data

As in a word processing application, you can find and replace data across multiple fields (including related fields) in a record or in a find request, across a found set of records or find requests, or across text objects in a layout. You can search for data in any type of field except container fields and fields that are not modifiable.

To find and replace data, in Browse, Find, or Layout mode, choose **Edit** menu > **Find/Replace** > **Find/Replace.**

Sorting records

FileMaker Pro stores records in the order they were added to the file. Sorting temporarily rearranges records, so you can view, update, or print them in a different sequence.

You choose the fields whose contents you want to sort by. The first sort field arranges the records based on the field's contents. The second sort field arranges records when two or more records have the same value in the first sort field, and so on. You can sort records in ascending order, descending order, or in a custom order.

By default, the records remain sorted until you perform a find or sort records by different criteria. When you add or change a record in a sorted found set, the record appears in the correct position in the sort order after you commit the record.

To sort the records in the current found set:

1. In Browse mode, click **Sort** in the status toolbar.

Note To sort records in Table View in Browse mode, see "Working with records in Table View" on page 27.

2. In the Sort Records dialog box, choose fields for sorting, in the order you want them sorted, and sort options.

To choose a sort field visible on the current layout, no matter what table it is in, choose **Current Layout (LayoutName)** from the table list, then double-click a field in the list.

To choose a sort field that is in the current layout's table, whether or not it is on the current layout, choose **Current Table (TableName)** from the table list, then double-click a field in the list.

3. Click **Sort**.

To cancel before sorting is finished, press Esc (Windows) or ⌘-period (OS X).

Note You can sort records on one field without opening the Sort dialog box by using the field's shortcut menu.

Previewing and printing files

With FileMaker Pro, you can print:

- all the records in the file, a subset of the records, or only the current record
- a blank record to create a paper form
- definitions of scripts, fields, tables, and relationships to see the structure of your database
- data saved as a PDF file

FileMaker Pro prints records using the current layout. You can create layouts to print the same data in different ways. For example, print records one by one, in a columnar list, or in a complex sorted report with totals, headers, and footers. You can control page margins, remove blank space, and keep specified objects from printing.
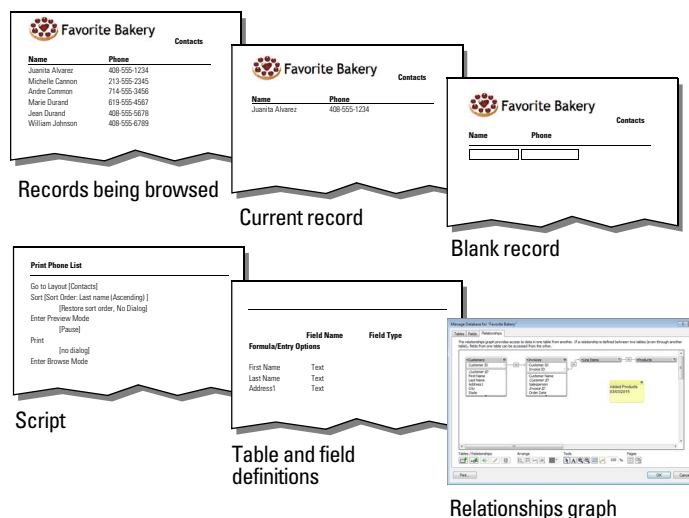
You can print data based on the current layout or print information about the structure of the database

Previewing data on a layout

When you switch to Preview mode, you see the layout as it appears on the printed page. You can't enter or edit information in fields in Preview mode.

In Preview mode, you see:

- how many records fit on a printed page
- how the pagination settings you choose affect page breaks
- subsummary parts with calculated summary fields
- variable information supplied by FileMaker Pro, like page numbers, the current date, and so on
- the page margins you define
- how fields set with sliding options close up blank space
- records arranged in columns if the Layout Setup dialog box is defined to print in columns
- the front-most tab panel or slide panel if the page contains panel controls
- popover buttons, but not their associated popovers or the contents of popovers

To preview data on a layout, you follow the same preliminary steps that you perform when you print, including specifying a printer and printing options and verifying that the found set contains the records you want to preview (see steps 1 through 4 in the next section, "Printing records"). Then, switch to Preview mode.

Printing records

You can print information from your file, or you can print a blank record in order to print a blank "form."

1. Specify printer and confirm printing options by choosing **File** menu > **Print Setup** (Windows) or **File** menu > **Page Setup** (OS X), then click **OK**.

In Preview mode, you can also click **Print Setup** (Windows) or **Page Setup** (OS X) in the status toolbar.

For information about printer options, refer to your printer and system documentation.

2. Switch to the layout to use.

3. Make sure the found set is the way you want it, by:

- using Find mode and commands on the Records menu to change the found set
- sorting the records

4. Switch to Preview mode to see how your paper copy will look.

If a record contains tab controls or slide controls, only the front-most panel is printed.

5. Choose **File** menu > **Print**.

6. In the Print dialog box:

- Windows: For **Print**, choose an option.
- OS X: Choose **FileMaker Pro** from the list. For **Print**, choose an option. If you don't see the options, click **Show Details**.

Note   To print a blank "form" of the layout, choose **Blank record, showing fields**.

7. Select the print range, number of copies and other printing settings, then click **OK** (Windows) or **Print** (OS X).

Printing table and field information

1. Choose **File** menu > **Manage** > **Database**, then click the **Tables** or **Fields** tab.

2. Select the table(s) or field(s).

3. Click **Print**.

4. Click **OK** (Windows) or **Print** (OS X).

Printing the relationships graph

1. Choose **File** menu > **Manage** > **Database**, then click the **Relationships** tab.

2. Click ⬚ to display page breaks in the relationships graph.

3. Click to display the Print Setup (Windows) or Page Setup (OS X) dialog box.

4. Change or accept the settings, then click **OK**.

5. Click **Print**.

6. In the Printing Options dialog box, choose to print on one page or multiple pages, then click **Continue**.

7. Click **OK** (Windows) or **Print** (OS X).

Backing up files

Routine backups are strongly recommended for any document stored on a computer. It is easier to restore a backed-up file than it is to re-create it. How often you should back up depends on the amount of data you are adding to your files, and how difficult it would be to re-create your files if they become corrupt.

For very important files, it's a good idea to routinely store backups at an offsite location.

For file backup recommendations, see "Backing up databases and other important files" on page 122. For an example of a backup script, see Help.

Setting preferences

You can customize the appearance and behavior of FileMaker Pro to suit the way you work by changing standard settings called *preferences*. Preferences affect the behavior of the application and are not specific to any file.

To set application preferences:

1. Windows: Choose **Edit** menu > **Preferences**.

OS X: Choose **FileMaker Pro** menu > **Preferences**.

2. In the Preferences dialog box, click a tab, then set options.

You can also set preferences that affect an individual file's default login information, layout, representative icon, spell checking, text handling, and scripts for opening and closing the file.

To set file preferences for the current file:

1. Choose **File** menu > **File Options**.

2. In the File Options dialog box, click a tab, then set options.

Chapter 3
Designing and creating solutions

This chapter explains the basics of how to:

- plan a FileMaker Pro solution
- define and modify fields
- define tables
- create layouts
- work with fields, objects, and parts on a layout

Note See Help for detailed, comprehensive information and step-by-step procedures about using FileMaker Pro.

Planning a solution

The first step in creating a solution is to plan the content, structure, and design. Then, you create a FileMaker Pro database file and define tables and fields.

A well-designed solution promotes consistent data entry and retrieval, and reduces the existence of duplicate data among the database tables. Relational database tables work together to ensure that the correct data is available when you need it. It's a good idea to plan a solution on paper first.

Follow these general steps:

1. Determine the purpose for your solution, or the problem you want to solve. For example, "to keep a list of my customers," "to manage my inventory," "to grade my students," or "to work with data on my desktop computer, on my iPad, and in a web browser."

   If other people will use the solution, be sure to talk with them about the data they will need.

2. Consider the information you will store in your database. Typically, information falls into broad categories. Accurately identifying these categories is critical to designing an efficient database, because you will store different types and amounts of data in each category. For example, a solution intended to track sales has categories such as "customers," "products," and "invoices." A database that records student grades has categories such as "students," "classes," and "assignments."

3. After you've determined the broad categories, consider how these categories are related. This can be done by writing simple sentences that describe how the categories interact, such as, "customers order products" and "invoices record customers' orders." Each of these pairs suggests a relationship between the data in one category and the data in the other category.

4. After you've identified your categories of information, you are ready to organize your database.

In database terminology, these categories of information are referred to as *tables*. Tables are used to group data containing a common element or purpose. For example, you might use one table to store names and addresses, while you use another table to store transaction details, such as date of sale, item number, unit price, and so on.

Typically, databases are organized in one of three ways:

- A single table in a single file. Use a single table if you need to track data in one category only, such as names and addresses.
- Multiple tables in a single file. Use multiple tables if your data is more complex, such as students, classes, and grades.
- Multiple tables in multiple files. Use multiple files if you need to share the same data among several different database solutions. For example, you can store your tax rates or shipping information in a separate file if you plan to use that information in more than one solution.

Note   Use relationships to share data between tables in the same file or with tables in external files. Other database elements, such as scripts and access privileges, are stored at the file level; therefore, some complex solutions will benefit from using multiple files.

5. Determine the database tables and the data they will include, and, in turn, which fields you will need.

Tip   To make it easy to search and sort records, create separate fields for first and last name, titles (like Mr. or Dr.), and items in addresses (city, state or province, country, and postal code). Separating your data into multiple fields at the time of data entry can make it easier to generate future reports. For example, using separate fields to capture transaction details such as the date, item number, quantity, and unit price of each transaction makes it easier to compile summary and subsummary reports at the end of a week, month, or year.

**6.** Decide which fields will contain common data among the tables.

For example, a database for a bakery business might include these tables: a Customers table, which stores customer information; a Products table, which stores product information; and an Invoices table, which stores order information.

Each table has only one subject, and all fields in a table describe only that subject. For example, the fields in one record of the Customers table together store all the information about one customer. For the same reason, you might assign each customer a unique, identifying number. You wouldn't enter a customer identification number into the table unless you had a new customer to add, so the existence of a customer number determines the existence of a record. A Customers table might also have fields for the customer's name, address, and phone number.

A Products table might have fields for a product identification number, the unit price for each product, and the quantity in stock. A Line Items table might have fields for product and invoice identification numbers, the name, unit price, quantity, and total price of each product sold. An Invoices table might have fields for an invoice identification number, order date, and salesperson.
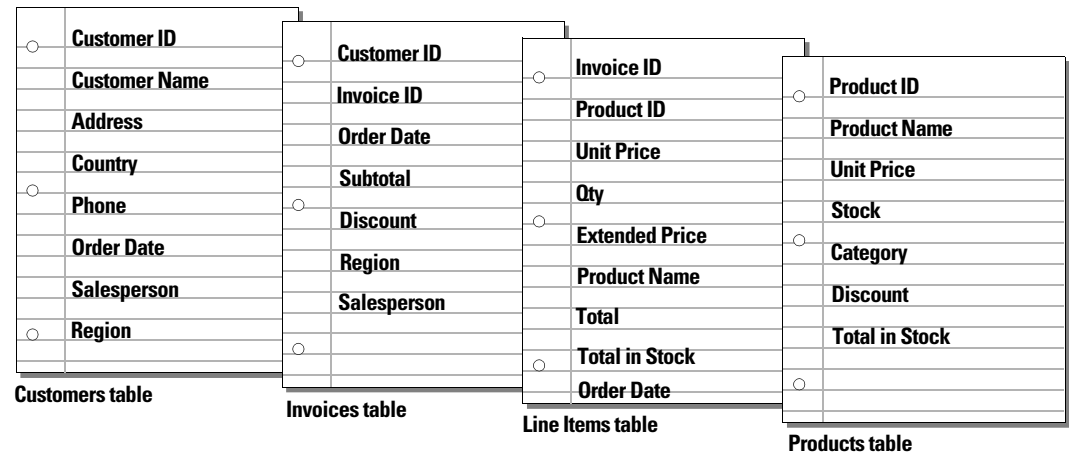

7. Determine the match fields for each table, and circle each one in your plan.

For more information, see "About match fields for relationships" on page 88.
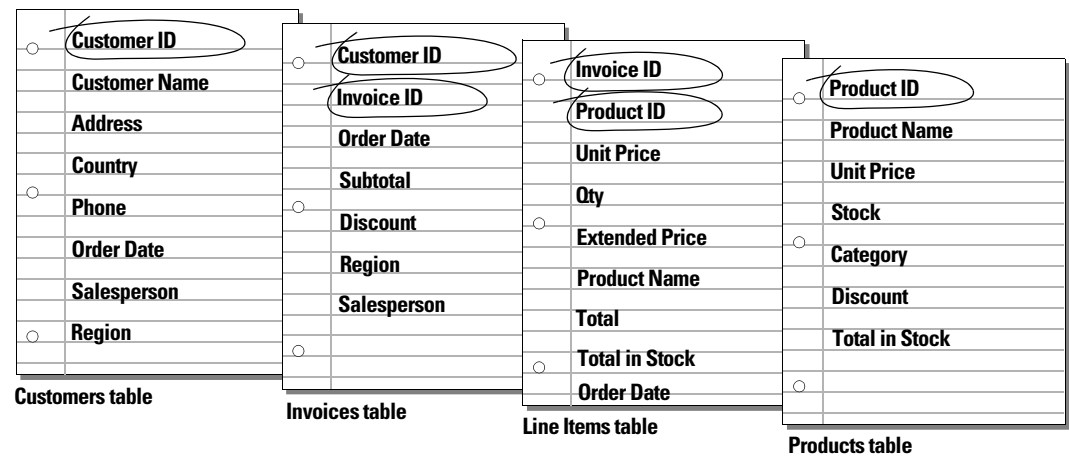
8. For each table, decide which fields will store data and which ones will be used from other (related) tables.

Based on a table's subject, you can see where it makes sense to store the data and where to use data from a related table. Other than match fields, all fields should appear only once in your database. Cross out occurrences of fields that don't pertain to the table's subject.
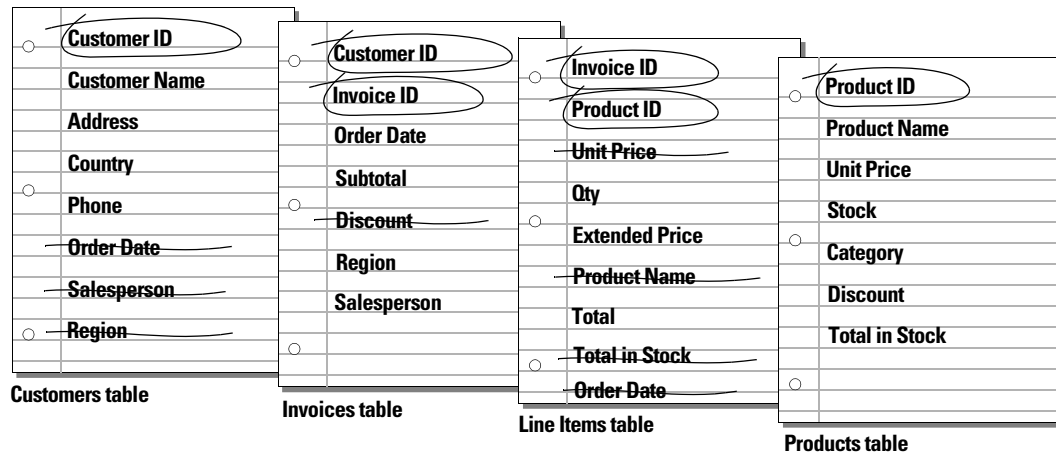
9. Determine the relationships between the tables. In your plan, draw a line from each match field in a table to the corresponding match field in the related table.

What establishes a relationship between tables is that their match fields contain matching data.
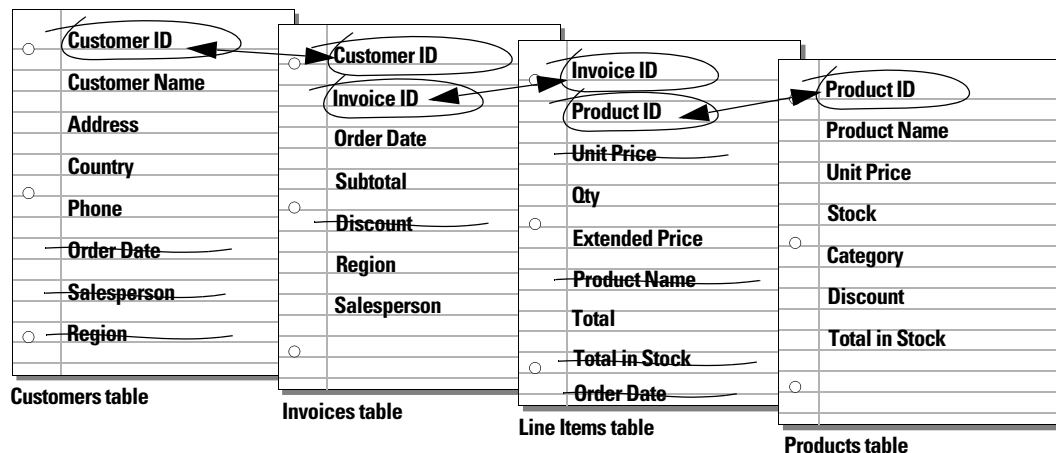
Relationships also make it possible to group your data to resolve complex queries. For example, relationships can be used to determine current inventory levels, sales projections, and other tasks where it is necessary to query data across multiple tables. For more information about relationships, see chapter 4, "Working with related tables and files."

10. Determine whether you need to share your database with other users and how they will access the file.

For more information about sharing databases, see "Sharing databases on a network" on page 98.

11. If you're designing the database for other people to use, show them your paper plan and ask them to review it and suggest any changes.

12. Consider who will use the database and whether you want to restrict access to it. When you create the database, assign access privileges as needed.

For more information about accounts and privilege sets, see chapter 6, "Protecting files."

13. Decide what layouts you need, and plan a separate layout for each task.

For example, create separate layouts for printing labels or envelopes, and for working on an iOS device (such as iPad or iPhone) or in a web browser.

For more information about creating layouts, see "Creating layouts and reports" on page 54.

14. Create a form, such as the one shown below, to list the files and tables you need and the fields for each table. Also list the forms and reports you will generate from each table.

Sample Solution Design Form

Project name

Purpose of this solution

Filename for this solution

Table name

Field name	Field type	Comments

Table name

Field name	Field type	Comments

Layouts

Name	Purpose	Screen	Print	iOS	Web

15. Create your database.

16. If you've designed the database for others to use, ask a few people to test it. Fix any problems before making it available for general use.

Creating a FileMaker Pro file

You can create a file from a FileMaker Pro Starter Solution—a pre-designed solution file that you can modify to suit your needs. Or, you can create a file without using a Starter Solution.

You can also create a file by making a copy of an existing FileMaker Pro file. See "Saving files" on page 17.

Creating a file using a Starter Solution

1. Choose **File** menu > **New from Starter Solution**.

Or, in the My Solutions tab of the Launch Center window, click **New** and choose **New from Starter Solution**.

2. Select a solution, then click **Choose**.

If no solutions are displayed, Starter Solutions may not have been installed.

3. Type a name for the file (choose a different folder, if needed), then click **Save**.

Windows: For **Save as type**, select **FileMaker Files**.

4. Click **Save**.

FileMaker Pro creates the file on your disk and opens the file.The pre-designed solution contains fields and buttons set up for tasks that are commonly performed, but it contains no data. You can modify fields and layouts in Starter Solutions. For more information, see the remaining sections in this chapter.

5. Click **New Record** in the status toolbar to add data to the file.

Creating a new file

1. Choose **File** menu > **New Solution**.

Or, to create a new file in the Launch Center window, click the My Solutions tab, click **New**, and choose **New Solution**.

2. Type a name for the file (choose a different folder, if needed), then click **Save**.

Windows: For **Save as type**, select **FileMaker Files**. If you don't type a file extension, FileMaker Pro adds .fmp12 to the filename. (For information about viewing file extensions in Windows, see Windows Help and Support.)

FileMaker Pro creates the file, displays a blank, empty file in Layout mode, and displays the Field Picker dialog box, which you use to define fields for the database and add them to the layout.

To have fields automatically placed on the layout, select **Add newly defined fields to current layout** in the Layout tab of the Preferences dialog box before you define the fields.

3. Define the fields, drag them to the layout, then close the Field Picker dialog box.

For details about defining fields using the Field Picker dialog box, see "Creating and changing fields in the Field Picker dialog box" on page 46.

You can set field options such as validation or indexing when you define a field, or at a later time. For more information, see "Setting options for fields" on page 50.

4. Add objects and other embellishments to the layout.

For more information, see "Working with objects on a layout" on page 66.

5. Save the layout by pressing Ctrl+S (Windows) or Command-S (OS X), then exit the layout (click **Exit Layout** in the layout bar).

Keep the following points in mind:

- For information about entering data in fields in Browse mode, see "Adding and duplicating records" on page 22.

- To change the layout theme, see "Working with layout themes" on page 60.

- You can change the width of a layout to accommodate more (or fewer) objects. Making a layout wider helps you see the edge of the layout without resizing the window. To change the width of a layout, drag the gray line on the right side of the layout.

Creating and changing fields

To define a new field in the database, you give it a name and select a field type. Then you select options that determine how the field interprets, enters, calculates, stores, and displays data. These characteristics make up the *field definition*.

See "Formatting field data on a layout" on page 76 for information about setting options for field formats, which control how data appears on a layout.

About naming fields

Follow these guidelines when naming fields:

- Field names must be unique. They can contain up to 100 characters.

- Use descriptive names that clearly identify the contents of the field. Avoid abbreviations, acronyms, or other terms that may cause confusion.

- Don't use any of the following symbols or words in the field name:

  - , (comma) + – * / ^ & = ≠ > < ≥ ≤ ( ) [ ] } " ; (semicolon) : (colon) :: (relational indicator) $ (variable indicator)

  - AND, OR, XOR, NOT, or the name of any FileMaker Pro function

- Don't begin a field name to be used in a calculation formula with a space, period (.), or number.

- Use _ (underscore) in place of a space to avoid restrictions in ODBC (Open Database Connectivity) or JDBC (Java Database Connectivity), exporting, web publishing, and other operations.

- If you're exchanging data with another application, check the field naming restrictions in the file formats supported by the other application.

- If you're using ODBC or JDBC to share FileMaker Pro data, avoid using SQL keywords in field names.

About choosing a field type

When you define a field, you select a field type based on the kind of information the field will contain. The field type determines what kind of data can be entered and what kinds of operations FileMaker Pro can perform with the data. FileMaker Pro uses the field type to interpret the data for tasks like sorting records and performing calculations.

Select this field type	If the field data will be
Text	Letters, symbols, and/or numbers used as text per field repetition, limited by available RAM and disk space. Indexes are nominally based on the first 100 characters of each word or value. Text fields may contain carriage returns.
Number	Values up to 800 digits or other characters, and the negative values of the same range. Number fields can also contain Boolean values (0 or 1), to indicate, for example, true, false, yes, and no. Number fields can't contain carriage returns.
Date	Dates only. Uses the Gregorian calendar with a range of 1/1/0001...12/31/4000. Month, day, and year order is based on system settings when the file is created.
Time	Times only. A time field can contain the hours, minutes, and seconds portion of a time. A time field can contain a negative time duration, for example, -08:40:00.
Timestamp	Dates and times to reference a fixed point in calendar time. For example, 10/25/2014 2:39:46 AM
Container	A file of any type, such as a picture, a PDF, or a multimedia file. You can set up storage and display options for the field. You can reference container fields in calculations and summary fields. You can't find or sort records based on container fields, but you can define text fields to describe or identify them. Then, you can find or sort records based on the description or identifying number in the text field. Files in container fields can be embedded, stored as a reference, or stored externally.
Calculation	The result of a calculation formula that uses field values from the current record or related records. The formula can use values of all field types. The result can be one of these types of data: text, number, date, time, timestamp, or container.
Summary	A value that's produced by summarizing field values from more than one record in the same table.

Summary fields produce results
from values in multiple records

Calculation fields produce results from values in
the current record or related records

Keep the following points in mind:

- Any field type except summary can store a global value. For more information, see "About indexing and storage options" on page 52.

- Be sure to use a date field (instead of a text or number field) to store dates. To avoid confusion when using dates, always use four-digit years.

- Use text fields instead of number fields to store postal codes, phone numbers, and other values with leading zeroes or characters like hyphens or parentheses.

- Although you can't find or sort records based on a container field, you can define a text field to describe or identify the contents of the container. Then, you can find or sort records based on the data in that text field.
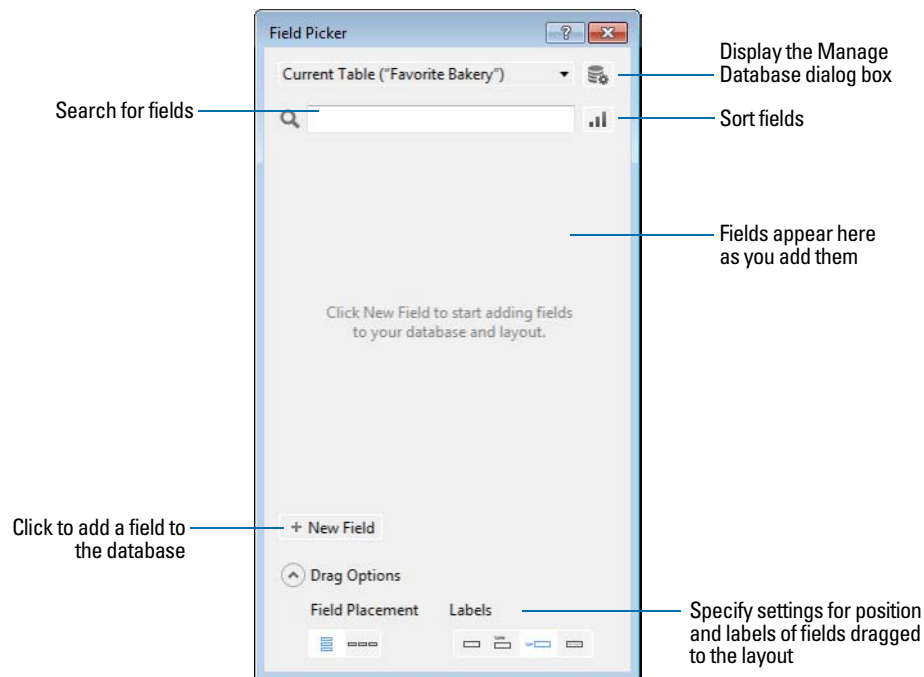
To change the way data is displayed in text, number, date, time, and timestamp fields, see "Formatting field data on a layout" on page 76.

Creating and changing fields in the Field Picker dialog box

When you create a new file, FileMaker Pro opens the file in Layout mode, and displays a blank layout and the Field Picker dialog box. Use the Field Picker dialog box to define fields for the file, and to add or change fields for an existing layout.

Note Fields are not automatically added to the layout when you define them in the Field Picker dialog box. To have fields placed on a layout when you define them, select **Add newly defined fields to current layout** in the Layout tab of the Preferences dialog box before you define the fields.

1. If the Field Picker dialog box is not open, in Layout mode, click 🔲 Field Picker in the layout bar.

2. In the Field Picker dialog box, add, delete, or change fields.

To	Do this
Add a field	Click **New Field**. A placeholder *Field* is created in the fields list, with a field type assigned. With the field selected, type a new name for the field. See "About naming fields" on page 43.
Change the field type	Click the field type and choose a new field type from the list. See "About choosing a field type" on page 44. **Important** Changing the field type can permanently and irretrievably erase data.
Set options for the field	Right-click the field and choose **Field Options**. See "Setting options for fields" on page 50.
Delete a field	Right-click the field and choose **Delete Field**. To delete multiple fields at a time, select the fields, then right-click and choose **Delete Field**. **Important** Before you delete a field, confirm that you don't need any of the data it contains.
Change a field's name	Windows: Double-click the field, then type a new field name. OS X: Select the field, then click the field name and type a new field name.

To	Do this
Sort fields in the list	Click ▫▫▫, then choose how to sort the fields.
Locate a field in a long list	Type the field name in the search box near the top of the Field Picker dialog box.

3. Repeat step 2 to continue defining fields.

4. When you drag fields to the layout, by default the fields are placed vertically on the layout, with field labels to the left of the fields. To change these settings, click **Drag Options** before you drag the fields to the layout.

- To change the position (horizontal or vertical) in which fields are placed on the layout, for **Field Placement**, click a choice.
- To specify the position of field labels, for **Labels**, click a choice.

Subsequent fields that are added to the Field Picker dialog box use the current drag settings.

Note   Changes to the drag settings have no effect on fields that are already on the layout.

5. Select the fields to place on the layout, then drag them to the layout.

6. Close the Field Picker dialog box by clicking the close button or pressing Esc.

Note   To create and change fields in the Manage Database dialog box, see Help.

Creating and changing fields in Table View

1. With the file open, in Browse mode, click **Table View** ⊞ in the layout bar.

2. Create new fields or change existing fields.

To	Do this
Create a field	To create the first field, click **Create Field** in the first column heading. To create additional fields, click **+** in the column heading, or click in the right margin.
Change a field name	Double-click the column heading for the field, then type the new name. See "About naming fields" on page 43.
Choose a field type	Right-click the column heading, choose **Field** > **Field Type**, and choose a field type. See "About choosing a field type" on page 44. Important Changing the field type can permanently and irretrievably erase data.
Set field options	Right-click the column heading, then choose **Field** > **Field Options**. See "Setting options for fields" on page 50.
Delete a field	Right-click the column heading, then choose **Field** > **Delete Field**. Important Before you delete a field, confirm that you don't need any of the data it contains.

For information about working with data in Table View (for example, adding, deleting, and sorting records), see "Working with data in Table View" on page 26.

Creating calculation fields

1. In Layout mode, click [≡ Field Picker].

2. In the Field Picker dialog box, click **New Field** and type a name for the calculation field.

3. Click the field type and choose **Calculation**.

4. In the Specify Calculation dialog box, if necessary, for **Evaluate this calculation from the context of**, choose a table from the list.

Setting the context for a calculation is only necessary when you're creating a calculation field in a *source table* that has two or more occurrences in the relationships graph. The source table is the table defined in the **Tables** tab of the Manage Database dialog box. The choice you make may affect the calculation results, particularly if your calculation will include fields in related tables.
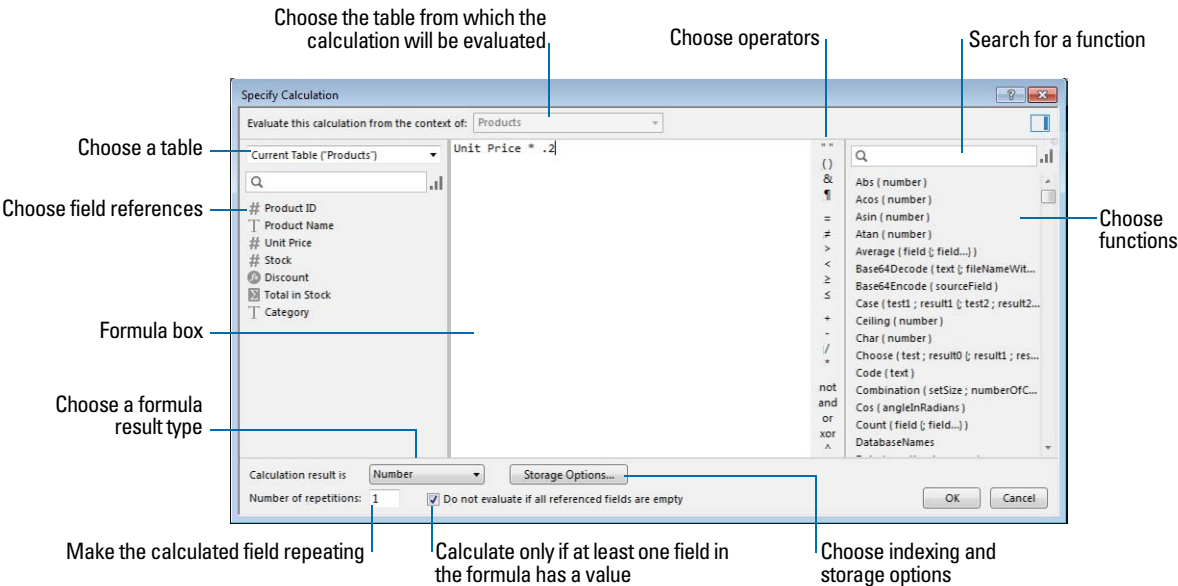
5. Build a formula for your calculation.

In the calculation pane, click where you want the item to appear, then do the following. You can also type the formula into the box.

To add a	Do this
Reference to a field	In the fields pane, double-click a field name. To display field names from another table, choose a table from the table list.
Mathematical or text operator	In the list to the right of the calculation pane, click an operator. (Quotation marks and parentheses are copied to the formula as a pair, with the insertion point blinking in the middle).
Comparison or logical operator, or an exponent	For **Operators**, choose an operator from the list.
Constant value	Type the value. A constant can be text, number, date, or time. Use date constants with the functions Date and GetAsDate, time constants with the functions Time and GetAsTime, and timestamp constants with the functions Timestamp and GetAsTimestamp.
Function	In the functions pane, double-click a function (a predefined, named formula that performs a specific calculation and returns a single, specific value). In the calculation pane, replace the placeholder parameter with a value or expression.

Procedures for working with formulas and a reference to all FileMaker Pro functions (organized alphabetically or by category) are available in Help.

6. Select calculation options for the field.

Choose the table from which the
calculation will be evaluated

Choose operators

Search for a function

Choose a table

Choose field references

Formula box

Choose a formula
result type

Choose
functions

Make the calculated field repeating

Calculate only if at least one field in
the formula has a value

Choose indexing and
storage options

To	Do this
Set the field type of the result	Choose a data type for **Calculation result is \<value\>**. Choose the correct type for the result. See "About choosing a field type" on page 44.
Make a calculated field repeating	Select **Number of repetitions**, then type the number of repetitions (up to 32,000).
Prevent calculation if all referenced fields are empty	Select **Do not evaluate if all referenced fields are empty**.
	When enabled, FileMaker Pro does not evaluate a calculation if all fields used by the calculation are empty.

7. To select indexing and global storage options for the field, click **Storage Options**, select options in the Storage Options dialog box, then click **OK**.

See "Setting options for fields" on page 50.

8. Click **OK** to close the Specify Calculation dialog box.

9. Drag the field to the layout.

Note   If your FileMaker Pro file accesses data from external ODBC data sources, you can add supplemental fields to specify calculations using external data. For more information, see "Using supplemental fields" on page 50.

Creating summary fields

Use summary fields to calculate values such as subtotals, averages, and grand totals across multiple records. For example, a summary field can display in a report the grand total of all sales in the month of May.

Use the New Layout/Report assistant to create a report with grouped data (data in a summary field). See "Creating layouts and reports" on page 54.

Tip   You can use Table View in Browse mode to quickly create a dynamic report that groups your data by a field, displays subtotals for a field, or creates subtotals for each group of data.

The value in a summary field can change depending on where you place the field on a layout, how many records are in the found set, whether the records are sorted, and which mode you're using.

If you're modifying a layout that contains a summary field, you must know about layout parts to get the results you want (see "Working with layout parts" on page 78).

1. In Layout mode, click 🔲 Field Picker .

2. In the Field Picker dialog box, click **New Field** and type a name for the field.

3. Click the field type and choose **Summary**, then specify options for the summary field.

Using supplemental fields

If your FileMaker Pro file accesses data from external ODBC data sources, you can use *supplemental fields* to display unstored calculation and summary results using ODBC data. Because you can't use FileMaker Pro to change the schema of an external ODBC database, supplemental fields are the only fields you can add to external tables.

For information about how to access and work with SQL data interactively, see "Working with external data sources" on page 108.

Setting options for fields

You can set field options when you define a field or at a later time. You use the Options for Field dialog box to set the following options for all field types except summary:

- entering default data into a field
- checking data against validation requirements
- making a repeating field
- creating an index
- storing container data externally
- storing a global value
- setting Furigana input options (Japanese language fields only)

Some field options help ensure the accuracy and consistency of your data. For example, if you type **Frnc** instead of **France** into the Country field, you won't find that record when you later search for all customers from France. To be sure that all country names are entered correctly, you can define a value list containing the names, then select the **Member of value list** validation option for the Country field. When you enter data into the field, the data must match a value in the list.

Keep the following points in mind:

- To set options for summary fields, see "Creating summary fields" on page 49.
- For calculation fields, you can set only indexing and storage options.
- You can set field options while you're working in Table View, Form View, or List View.

To define options for fields:

1. With the file open, in Layout mode, click 🔲 Field Picker .

2. In the Field Picker dialog box, right-click the field and choose **Field Options**.

3. In the Options for Field dialog box, click a tab.

To	Click
Automatically enter a default value into a field for each record	**Auto-Enter**
Define field validation options to ensure that data is entered into the field correctly. FileMaker Pro displays a message if you enter data incorrectly	**Validation** Important To avoid confusion when using dates in FileMaker Pro, set date field validation options to make sure dates are always entered with four-digit years.
Set options for indexing fields and for storing the results of calculations, and set data storage options for container fields	**Storage** See "About indexing and storage options" on page 52 and "Creating calculation fields" on page 48.
Set options for Furigana fields	**Furigana**

Click **Auto-Enter**

Select options for entering default data in the field

Auto-Enter options for fields

Click **Validation**

Select validation options for the field

Validation options for fields

Click **Storage**

Select the storage option for the field

Storage options for all field types except container fields

Select storage options for a container field
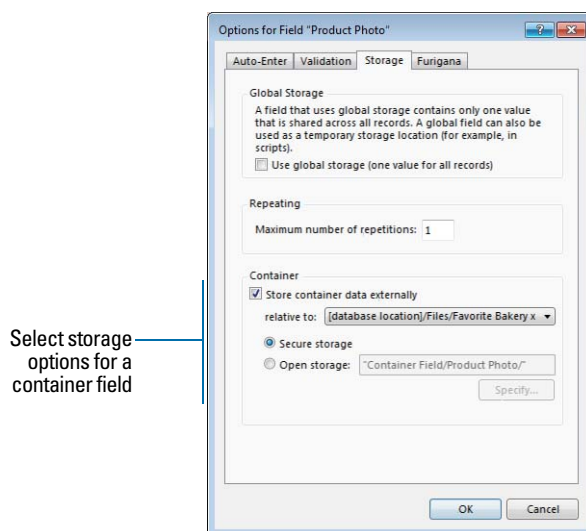
Storage options for container fields

For information on value lists, see "Setting up fields to display checkbox sets and other controls on a layout" on page 74.

About indexing and storage options

FileMaker Pro provides options for indexing fields and for storing the results of calculations. You can:

- Create an *index*, which is a list of the values stored in a field. An index greatly speeds searches, but takes up space on your disk. You can index text, number, date, time, and timestamp fields. You can also index calculation fields if the results are text, numbers, dates, times, or timestamps.

- Store the result of a calculation field in your database, or you can have FileMaker Pro perform the calculation only when needed (*unstored*). Storing the result is faster but takes up more space on the disk. You can specify storage options for text, number, date, time, timestamp, and calculation fields.

- Set any field (except summary fields) to share one value across all records in a file if you select **Use global storage** in the Storage tab of the Options for Field dialog box. Fields defined with global storage are also referred to as *global fields*.

- Store data for a container field in a location that's external to the file, such as in a different folder or directory on the local or a host computer.

Creating database tables

Use database tables to organize and group your data by a common characteristic or principle. Your database can contain as many tables as you need to organize your data.

In addition to storing data, FileMaker Pro uses tables to describe relationships in the relationships graph, and establish the *context* for layouts and some calculations. In FileMaker Pro, context is the starting point from which calculations and scripts are begun and from which a relationship is evaluated in the relationships graph.

When you create a new file, FileMaker Pro automatically creates the first table and the first layout. The table and the layout are given the same name as the file.

You create additional tables in the Manage Database dialog box.

1. With the database open, choose **File** menu > **Manage** > **Database**.

2. In the Manage Database dialog box, click the **Tables** tab.
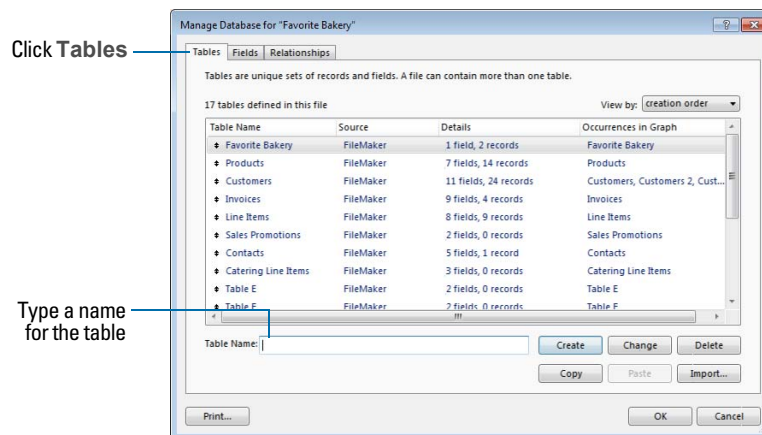
3. In the **Table Name** box, type a name for the table, then click **Create**.

The table can be renamed or deleted. Tables you add to a file are automatically displayed in the relationships graph.

4. Continue to define tables, or click the **Fields** tab to define fields.

For information about relationships, tables, and the relationships graph, see chapter 4, "Working with related tables and files."

Creating layouts and reports

FileMaker Pro layouts determine how information is organized for viewing, printing, reporting, finding, and entering data. Layouts don't store your data—they just display it. Layouts are sometimes called reports, especially when printed.

You can create as many layouts as you need for a file (for example, layouts for entering data, reporting summaries, or printing mailing labels). You can change a layout's design without affecting the data or other layouts for the file. Layouts can include certain fields and exclude others. When you change the data in a field (in Browse mode), the changes are reflected in the same field for the same record on all the layouts in the file.
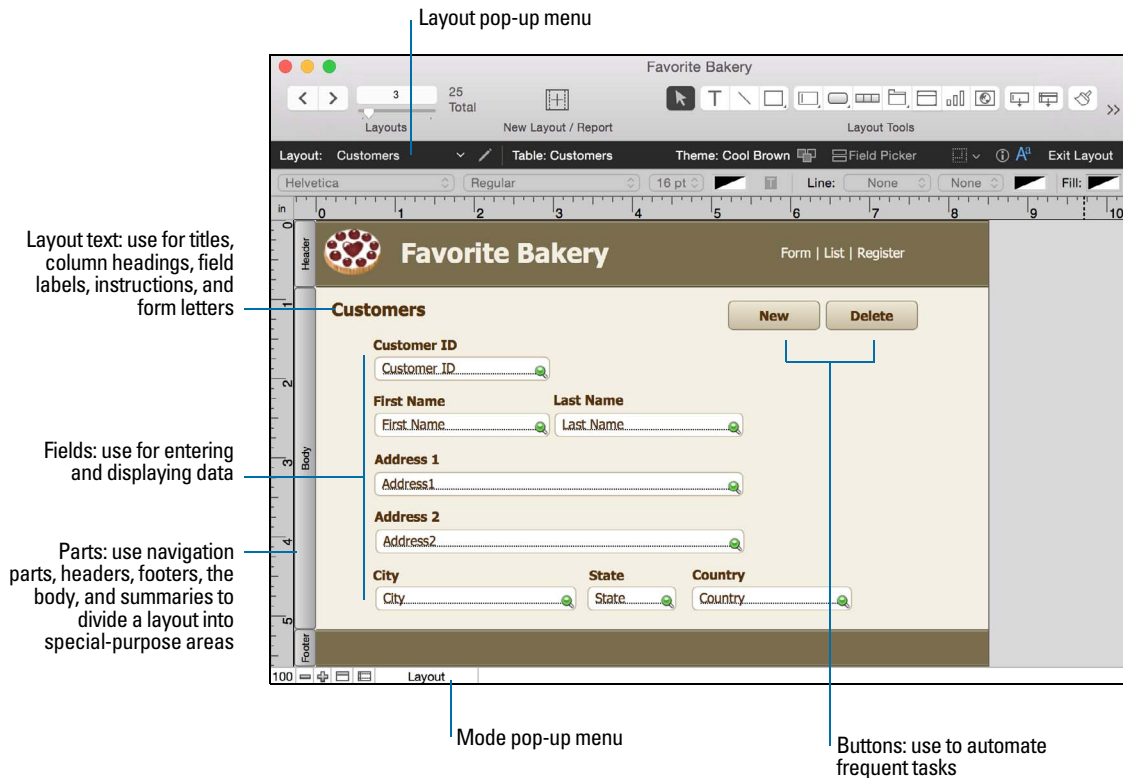
When you create a file (without using a Starter Solution), FileMaker Pro automatically creates a layout for the initial table in the file, and for each newly added table that contains fields.

You create additional layouts by switching to Layout mode and using the New Layout/Report assistant, which guides you through creating a layout according to options you choose. Use the different layout types for various purposes, like displaying a data entry screen or printing a totaled sales report or mailing labels. You can then customize each layout by using the design tools that are available in Layout mode.

Important   FileMaker Pro considers the selected device, printer, and print or page setup information when it calculates margins and other measurements on the layout. Printer and print settings depend on the printer and system software you're using. Refer to your printer and system documentation for more information.

Keep the following points in mind:

- If you are designing solutions for use with FileMaker Go or FileMaker WebDirect, see the design guidelines in *FileMaker Go Development Guide* or *FileMaker WebDirect Guide*.

- If you intend to print the new layout in landscape orientation or on a special paper size, in Browse or Layout mode, choose **File** menu > **Print Setup** (Windows) or **File** menu > **Page Setup** (OS X), confirm the orientation and paper settings, then click **OK**. Modified Print Setup and Page Setup settings affect all other layouts in the current file, so you may need to change these settings later to print other layouts properly.

- You can easily manage the layouts and layout folders in your file using the Manage Layouts dialog box. For example, add, delete, and duplicate layouts and folders, open multiple layouts, and change the order in which layouts and folders appear in the Layout pop-up menu.

To create a layout:

1. In Layout mode, click **New Layout/Report** in the status toolbar.

Or, in Browse mode, choose **File** menu > **Manage** > **Layouts**, and click **New**.

You see the New Layout/Report assistant, which helps you create a layout. As you make your choices, additional options are presented to you. For example, if you choose **Custom Device**, you can specify a width and height for the device. For some types of layouts, such as labels, envelopes, and reports, you see additional panels.

2. If the file has multiple tables, for **Show records from**, choose a table.

3. For **Layout Name**, give the layout a name.

4. Choose the type of layout to create.

For a description of each layout type, see "About layout types," below.

5. Depending on the layout type you choose, additional options may become available.

To	Do this
See an onscreen Help topic that explains the choices in the current panel	Windows: Press F1 (Windows) or Command-? OS X). If the layout you're creating has additional panels (such as for labels, envelopes, or reports), you can also click ⬚?⬚ (Windows) or ⑦ (OS X) to get information about those panels.
Accept the settings in the panel and continue to the next panel (available for labels, envelopes, and reports layouts)	Click **Continue** or **Next**.
Accept the settings in the panel but go back to the previous panel (available for labels, envelopes, and reports layouts)	Click **Back**.
Close the assistant without saving any of your choices	Click **Cancel**.

6. When you have finished making your choices, click **Finish** to create the layout.

7. For layouts designed for computers or touch devices, add fields to the layout.

See "Creating and changing fields" on page 43.

Keep the following points in mind:

- You can use the tools and commands in Layout mode to further customize the layout. See "Working with objects on a layout" on page 66 and "Working with fields on a layout" on page 72.

- If you click **Finish** in the first panel of the New Layout/Report assistant without choosing a layout type, FileMaker Pro creates a blank layout. A blank layout contains no fields; you add the fields in Layout mode. A blank layout is a good starting point for complex layouts (for example, a data entry screen or form letter).

- Each layout that you create is assigned a layout theme. If the new layout is the same type (Computer, Touch Device, or Printer) as the current layout, the same theme is assigned to the new layout; if the new layout is a different type, the appropriate default theme is assigned. See "Working with layout themes" on page 60.

About layout types

You can use the New Layout/Report assistant to create several types of layouts, which are described below.

Computer

Computer layouts are designed to display within the dimensions of most laptop and desktop computer screens. After you choose **Computer**, you choose the view in which to display the layout (Form View, List View, or Table View), or you can create a report (see "Report," below). After you finish the assistant, you add the fields and any layout objects and embellishments to the layout.

The default theme for Computer layouts is Enlightened.

Touch Device

Touch Device layouts are designed to display on touch-compatible input devices, including iPad, iPad mini, or iPhone, or on a device with dimensions that you can customize in the assistant. After you choose **Touch Device**, you choose the view in which to display the layout. You can also choose the orientation—portrait or landscape—for the layout. For custom devices, you can specify the layout's width and height. After you finish the assistant, you add the fields and any layout objects and embellishments to the layout.

The default theme for Touch Device layouts is Enlightened Touch.

Printer

Printer layouts are designed for printing data on labels (horizontal or vertical), envelopes, and in reports. The Printer layout choices are described below.

The default theme for Printer layouts is Enlightened Print.

Labels

Use a Labels layout to arrange fields you select to print on one of the predefined standard label sizes. (FileMaker Pro includes the dimensions of a large number of standard label types.) If the label type isn't available, you can specify custom label dimensions.

You can only print (or preview) data; you cannot add information. (Use another layout type for data entry or finding data.)

Labels in Layout mode

Labels in Preview mode
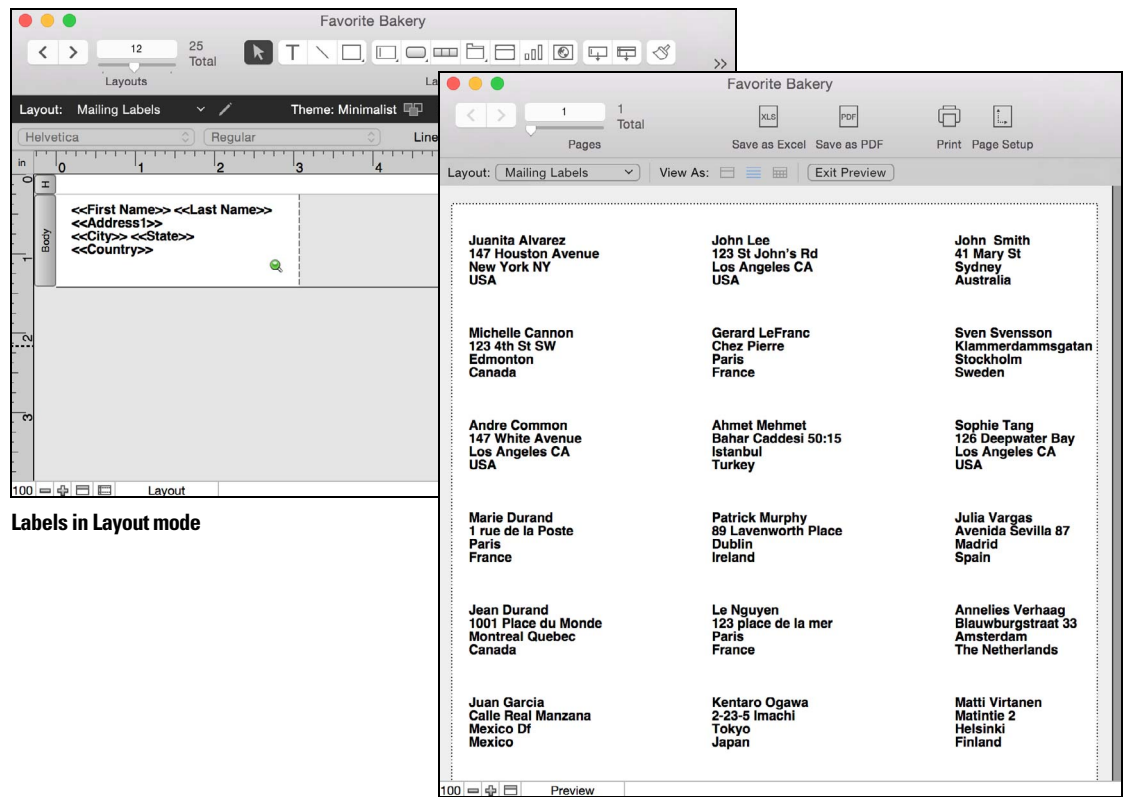
For more information about creating a Labels layout and printing labels, see "Printing the labels or envelope" on page 59.

Vertical Labels

With the Vertical Labels layout, Asian and full-width characters are rotated so that labels can be used vertically.

For more information about vertical writing, see "Formatting fields and text for vertical writing" on page 77.

Envelopes

Use an Envelopes layout to print the fields you select, arranged to print on a standard "Number 10" business envelope. You can only print (or preview) data; you can't add information. (Use another layout type for data entry or finding data.)
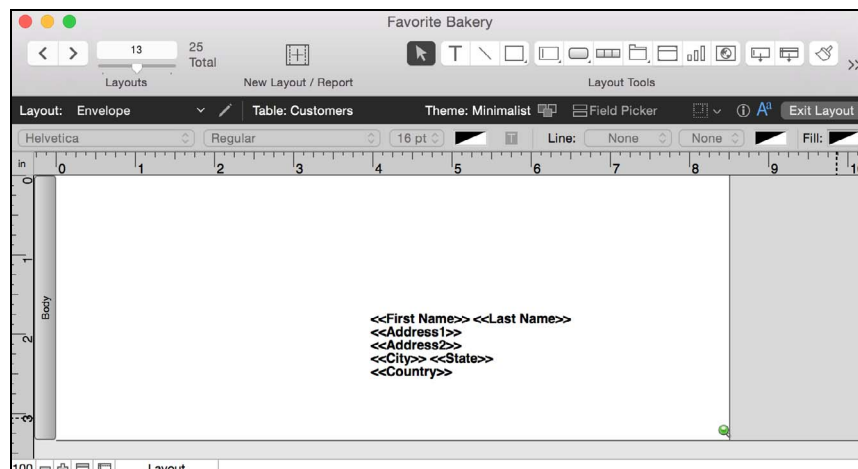
For more information about creating an Envelopes layout and printing on envelopes, see "Printing the labels or envelope" on page 59.

Report

The New Layout/Report assistant lets you define varied report formats. You can create a Report layout with simple rows and columns of data (formerly a predefined layout type known as the List view layout), or a complex report with data grouped by specified values and including subtotals and grand totals.

You can also group records by sorting data by selected fields. You can then subtotal, or subsummarize, data in these groups (for example, group sales data by region, then subtotal sales for each region).

When you create a Report layout in the assistant, you can then choose to:

- include subtotals and grand totals in the report
- add header and footer parts with static text (like your company's name), dynamic text (like the page number or current date), or a graphic (like your company logo)
- group records by sorting; you can then subtotal or subsummarize data in the groups (for example, group sales data by region, then subtotal sales for each region)
- save information in a script to rerun the report (for example, switch to the report layout and sort the data)

You can modify any of these options after you finish the assistant.

Creating Labels and Envelopes layouts

When you create a Labels or Vertical Labels layout, FileMaker Pro provides the dimensions of numerous standard label types and their codes (for example, Avery 4014). If the label type isn't available, you can specify custom label dimensions.

Labels layouts and Envelopes layouts use *merge* fields, which are placeholder fields for displaying and printing only; you can't enter data into merge fields. Merge fields expand and contract to fit the data in the field as needed, and close up space if the field is empty. (See "About merge fields" on page 75.)

Setting up the layout

1. In Layout mode, click **New Layout/Report**.

The New Layout/Report assistant appears. For onscreen help as you use the assistant, press F1 (Windows) or Command-? (OS X) in each panel.

2. Choose a table, and type a name for the layout.

3. Choose **Printer**, then choose either **Labels** (for data that reads top to bottom horizontally) or **Vertical Labels** (for data that reads right to left vertically).

For an Envelopes layout, choose **Printer**, choose **Envelopes**, and click **Continue**. Then skip to "Choosing and formatting the merge fields," below.

4. Click **Continue**.

5. In the Specify Label Layout panel, specify the measurements of your mailing labels:

- To choose a predefined measurement based on common label types, for **Use label measurements for**, choose the code that matches your labels. (This information is on the package your labels came in.)

- To specify a custom measurement, choose **Use custom measurements**, and enter values for **Labels across the page**, **Width**, and **Height**. Measure the unused margins on the label stock. Then select **Fixed page margins** and enter values for **Top**, **Bottom**, **Left**, and **Right**.

6. Click **Next**.

Choosing and formatting the merge fields

1. In the next panel, for the **Available fields** list, double-click the first field whose data you want on the labels or envelope.

<<*field name*>> appears in the **Label contents** or the **Envelope contents** area. Angle brackets indicate that this is a merge field, and field data will display in and print on the labels or envelope.

To include fields from related tables, choose the table from **Available fields**.

2. Continue selecting fields.

3. Include all punctuation, blank spaces, and line breaks (to place a merge field on the next line) that you want printed.

4. Click **Finish**.

Printing the labels or envelope

1. Load the labels or the envelope into your printer.

2. Choose **File** menu > **Print**, specify options, and click **Print**.

Keep the following points in mind:

- To specify how labels will print on the page, choose **Layouts** menu > **Layout Setup**, and click the **Printing** tab. Then choose the number of columns (labels) across and the direction in which you want the labels printed, and set custom page margins, if needed.

- You may need to adjust your printer settings to print the labels correctly. Choose **File** menu > **Print Setup** (Windows) or **Page Setup** (OS X).

Working with layout themes

Use FileMaker Pro themes to enhance the appearance of a layout or report and to give all your layouts a consistent look. A theme affects characteristics of the layout, including the background color, field borders and fill, and text attributes in and outside of fields. A theme does not control the placement or behavior of fields or objects. You can change the theme of an existing layout in Layout mode.

To change the theme of a layout:

1. Display the layout.

2. In Layout mode, choose **Layouts** menu > **Change Theme**, or click in the layout bar.

3. Select a theme from the current file in the **Layout themes** list, or import a theme from another FileMaker Pro file.

To import a theme, click **Import Themes**, choose the file containing the theme(s) to import and click **Open**. Select themes in the Import Themes dialog box and click **OK**. Then select a theme in the **Layout themes** list.
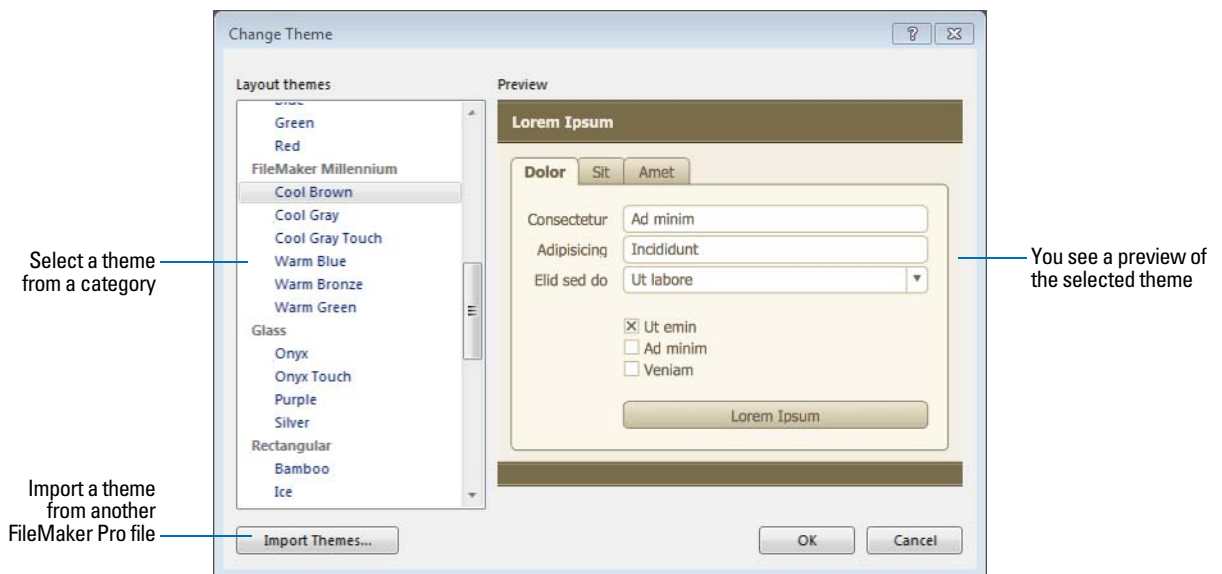
4. Click **OK** to apply the selected theme to the current layout.

Keep the following points in mind:

- When you change a layout's theme, FileMaker Pro applies the attributes of the new theme to all objects on the layout except the following:
  - The font and font size remain from the original layout or theme.
  - Buttons created using versions of FileMaker Pro earlier than version 12 retain their original formatting.
  - Objects on the layout background that are filled with an image, or a layout background that is filled with an image, retain the image.
- You may need to resize layout parts and layout objects after a theme is applied for the layout to display properly.
- If you're creating a layout to be used with FileMaker Go, choose one of the Touch themes.
- If you're creating a layout to be printed, choose one of the Print themes.
- If you're making many changes to styles and intend to save them as a custom theme, start with the Minimalist theme or Minimalist Touch theme, which has no custom styles.
- The styles of layout objects, layout parts, and the layout background are controlled by the layout's theme. If the pre-designed themes do not display the styles you want, you can create and apply a custom theme. See the next section, "Working with layout object, part, and background styles."
- To see which themes are in use in a file, or to import themes from other files, choose **File** menu >**Manage** >**Themes**.

Themes used in the current file

Number of layouts that use each theme

Select an action to perform on the selected theme
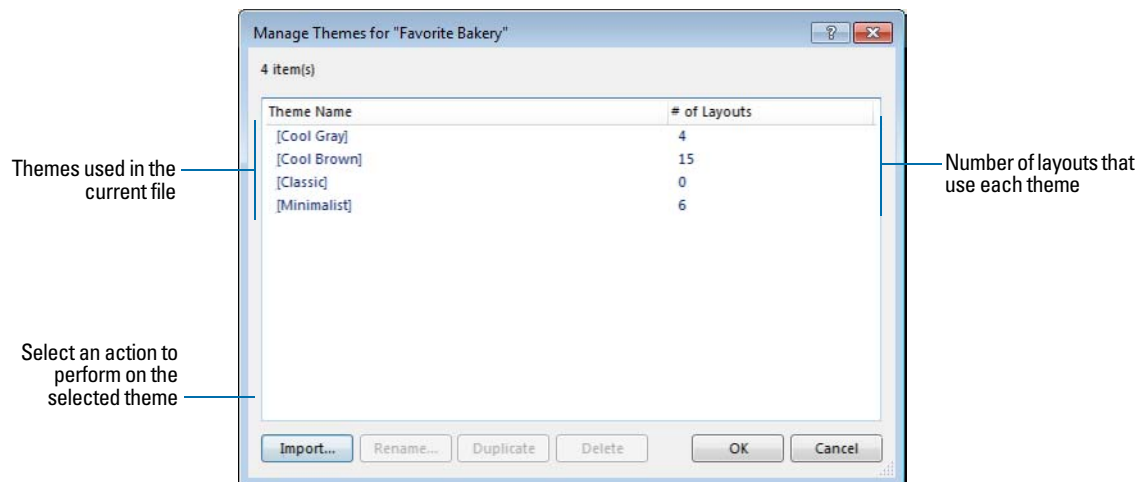
Working with layout object, part, and background styles

Each layout theme includes default styles for the objects and layout parts that you create while using that theme. Styles give objects and parts on a layout a consistent appearance. They also save you the time of reassigning formatting attributes each time you create a new object or part. A theme also includes a default style for the layout background.

Some themes include additional default styles for some objects. For objects that have multiple components, each component has a separate style. For example, portals have a Portal style, which formats the entire object, and a Portal: Rows style, which formats only the rows of the portal.

You can modify default styles or design new styles and save them for use on the current layout. When you edit and save formatting attributes for styles that are applied to multiple objects or layout parts, your changes are applied to all objects and parts that use those styles on the current layout.
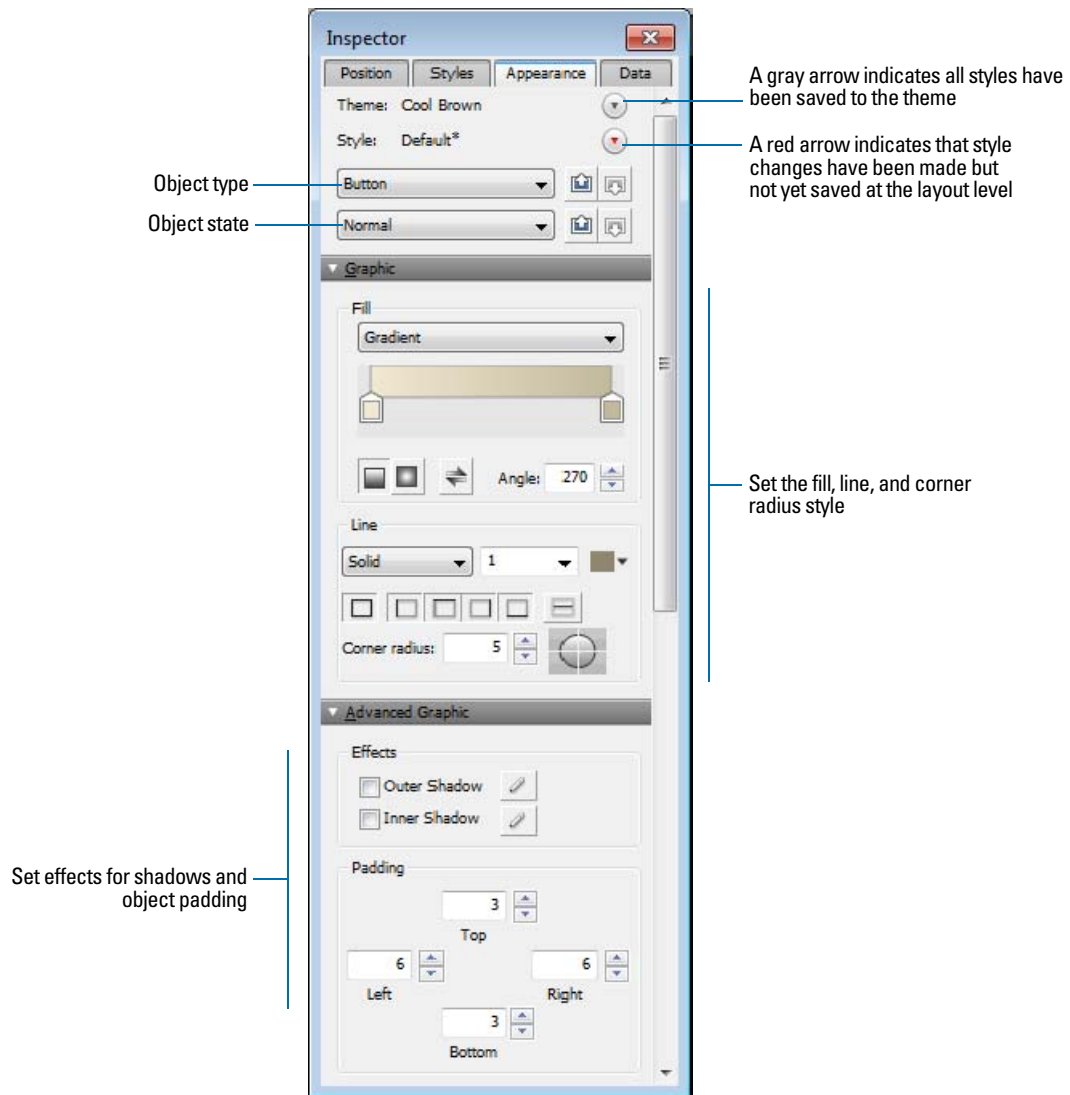
You can also create new styles with custom names, which you can then apply to objects, layout parts, or the layout background on the current layout. Any styles you modify and save, or any custom styles that you create, apply only to the current layout.

To use your custom styles on other layouts, save your styles to a theme. You can save custom styles to FileMaker Pro themes or you can create new custom themes.

Use the Styles tab in the Inspector to view and apply defined styles.
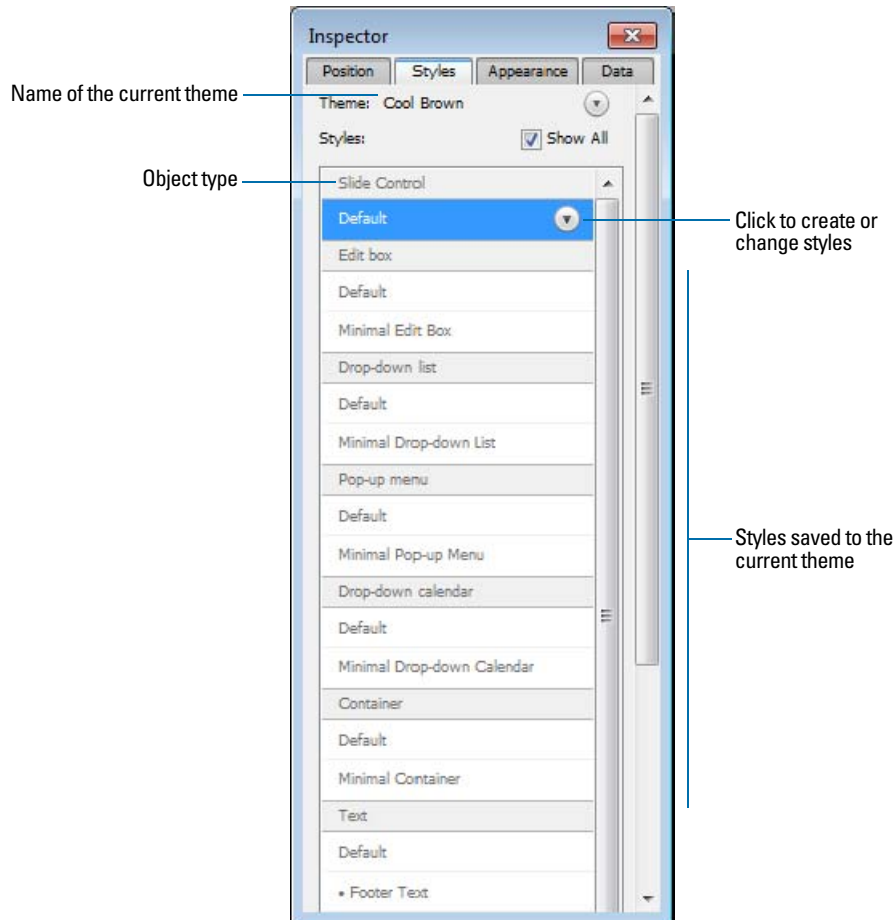
Use the Appearance tab in the Inspector to create and modify styles and themes.

Object type

Object state

A gray arrow indicates all styles have been saved to the theme

A red arrow indicates that style changes have been made but not yet saved at the layout level

Set the fill, line, and corner radius style

Set effects for shadows and object padding

For details about working with styles for layout objects, layout parts, and the layout background, and about saving styles to themes, see Help.

Setting up a layout to print records in columns

You can set up a layout to print (or preview) records in columns, for example, for a directory of names and addresses. When you set up records to print in columns, all the field values (and labels, if specified) for one record are printed together in a block (much like on a label), then all the values for the next record are printed together, and so on. You only see multiple columns in Layout and Preview modes and when you print (not in Browse mode or Find mode).

You can choose to arrange columns across the page or down the page.

Down first   **Across first**
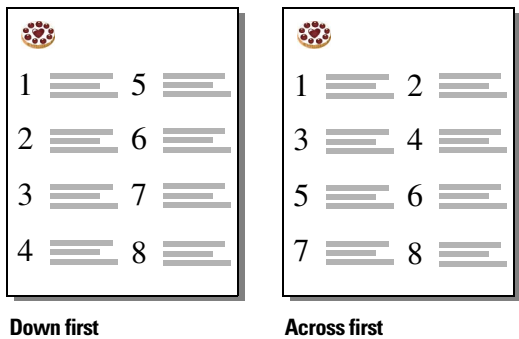
Setting up columns in a layout

1. Choose a printer, and print setup or page setup options.

FileMaker Pro considers the selected printer, and print or page setup information when it calculates margins and other measurements on the layout.

2. In Layout mode, create a layout or choose a layout from the Layout pop-up menu.

It's easiest to start with a Blank layout or a layout with no objects in the body part.

3. Choose **Layouts** menu > **Layout Setup**.

4. In the Layout Setup dialog box, click the **Printing** tab, select **Print in *<value>* columns**, select options for the columns, then click **OK**.

To	Do this
Specify the number of columns	For **Print in <value> columns**, type a number between 1 and 99.
Arrange records to flow across the page first (left to right, a row at a time)	Select **Across first.** Use this option for reports like labels, to use the fewest number of rows and preserve label stock.
Arrange records to flow down the page first (top to bottom, a column at a time)	Select **Down first.** Use this option for reports like directories, where you read from top to bottom, column by column.

5. On the layout, you see vertical lines indicating columns.

6. Place or arrange fields and other layout objects so they are contained within the sample column on the left.

Use merge fields or fields or objects with sliding enabled to fit more data into the width of a column. With either of these two features, fields can extend into the gray area of the second column, and blank space in fields is eliminated when you view or print data.
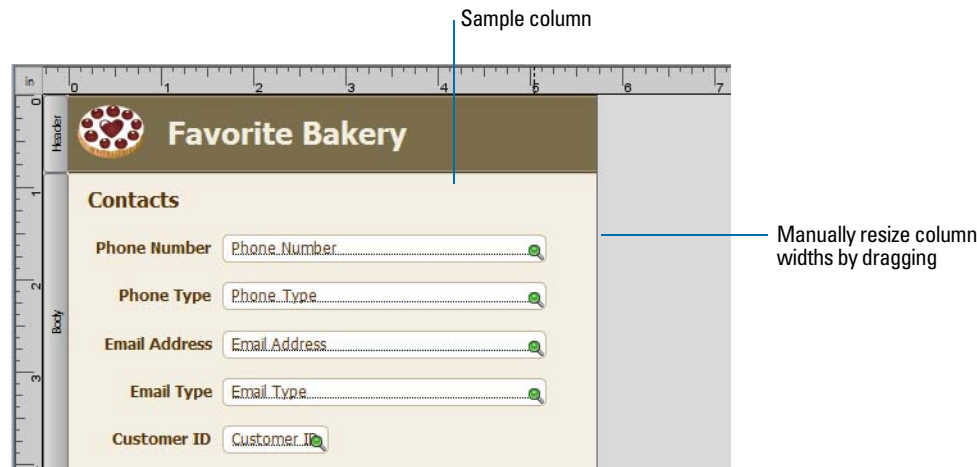
Changing the width of columns

The initial width of each column is calculated based on the paper size, orientation, and any margins you have set. To change the width of columns, do one of the following:

To	Do this
Interactively adjust the width of the columns	Drag the right column boundary (the vertical dashed line at the right edge of the sample column). If you widen the column, you see a medium-gray area that indicates a "gutter" area that won't print.
Precisely measure and adjust the width of the columns	Click **Inspector** ⓘ in the layout bar. Click **Position**. Position the pointer over the right column boundary, hold down the mouse button (be careful not to drag the column width), and read the column **Width** value in the Size area.

If you change the number of columns, FileMaker Pro adjusts the width of the columns to fit within the width of the paper size you have defined, not including fixed margins. You may need to readjust fields to fit within the sample column.

Working with objects on a layout

An *object* is a discrete element—a field, text, a graphic object (such as an oval or imported picture), a button, a button bar, a portal (for displaying rows of related records), a tab control or slide control, a popover button and its popover, a chart, or a web viewer—that you can select, move, resize, delete, copy, format, or otherwise change. Place objects on a layout to enhance its design.

For each type of object you work with, you use specific tools from the status toolbar.
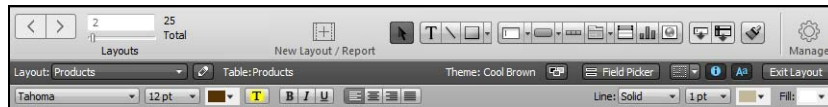
Status toolbar in Layout mode (Windows)

Status toolbar in Layout mode (OS X)

Note   If you don't see the status toolbar at the top of the document window, the status toolbar might be hidden. Make sure you're in Layout mode, then click the status toolbar control button ▭ at the bottom-left corner of the document window (or choose **View** menu > **Status Toolbar**).

Organizing data with panel controls and popovers

Tab controls, slide controls, and popovers are useful ways of organizing data. For example, you could create tab panels for various categories of products.

- To create a tab control, in Layout mode, choose **Insert** menu > **Tab Control** or click the **Tab Control tool** ▭.

Click a tab to display another tab panel

Tab control — — Tab panel
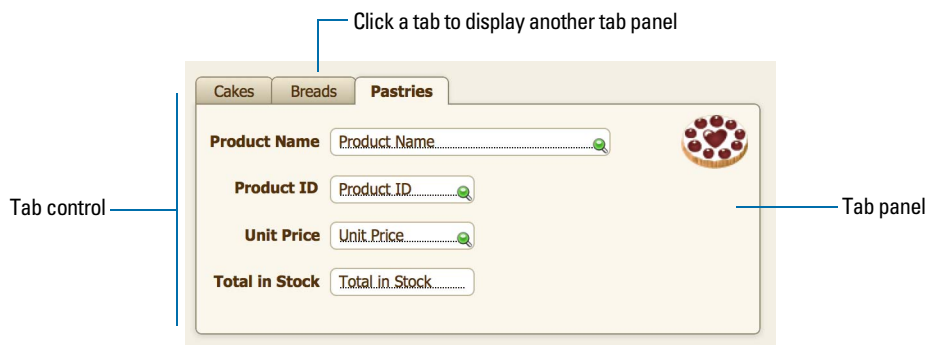
Tab control in Browse mode

■ To create a slide control, in Layout mode, choose **Insert** menu > **Slide Control** or click the **Slide Control tool** 🖵.
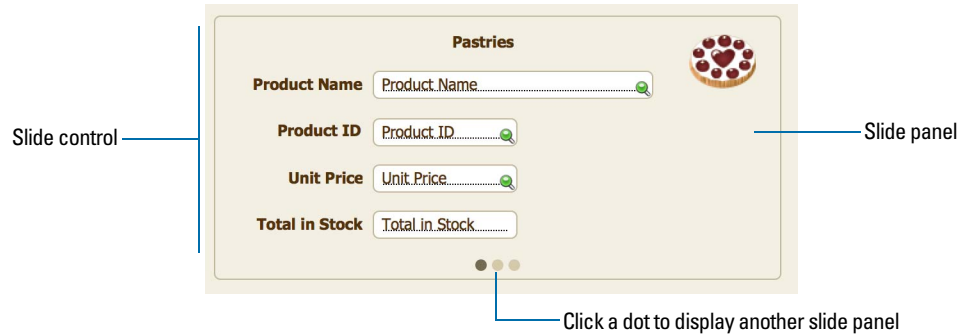
Slide control in Browse mode

■ To create a popover, in Layout mode, choose **Insert** menu > **Popover Button** or click the **Popover Button tool** ▢.

Popover button and popover in Browse mode

Using the Inspector to format objects

In Layout mode, you can use the Inspector to view and modify the settings for objects. Each tab focuses on a different aspect of formatting. Hold your pointer over options in each tab to see a description of what they do.

To open the Inspector:

- Click **Inspector** ⓘ in the layout bar.
- Choose **View** menu > **Inspector**.

Click the tabs to format different aspects of an object

Enter settings for an object's position on the layout

Anchor the object to the top, bottom, left, or right side of the window (in Browse or Find mode) or the left or right (in Preview mode or when printing)

Select settings for an object's relative position, and for resizing an object

Select settings for printing and previewing objects

Select settings for working with the grid

You can open multiple Inspector windows to make it easier to work on a layout. For example, display the Data tab of an Inspector window and the Appearance tab of another Inspector window to have access to the options on each tab. To open another Inspector window, choose **View** menu > **New Inspector**.

Using tools to precisely position objects

FileMaker Pro provides several tools to help you precisely create, size, reshape, move, and position objects in Layout mode.

To show or hide page breaks in Layout mode, choose **View** menu > **Page Breaks**.

Note   To use the Inspector to position objects, see Help.

Rulers

Showing the rulers displays a horizontal and vertical ruler along the edge of a layout. Guide lines on each ruler track the position of the pointer as you move the pointer on the layout.

- To show the rulers, in Layout mode, choose **View** menu > **Rulers**.
- To hide the rulers, choose **View** menu > **Rulers** again.

Grid

Showing the grid displays a series of nonprinting intersecting horizontal and vertical lines. The grid aligns objects you create, resize, move, or position. Objects "snap to" the grid to help you create and edit objects more precisely. Gridlines adjust when you change the unit of measure.

To show or hide the grid, do one of these:

- In the Inspector, click the **Position** tab. In the Grid area, select or deselect **Show grid**.
- Choose **View** menu > **Grid** > **Show Grid**. To hide the grid, choose **Show Grid** again.

Guides

Guides help you align objects within the same layout and across multiple layouts.

- To create a vertical guide, drag out from the vertical ruler.
- To create a horizontal guide, drag down from the horizontal ruler.

If the ruler isn't displayed, choose **View** menu > **Rulers**.

Dynamic guides

When you drag objects to move, resize, or position them on a layout, dynamic guides appear near or on the objects to help you create and edit them more precisely. Dynamic guides also "snap to" the upper and lower boundaries and the centers of objects as you move, resize, or position them.
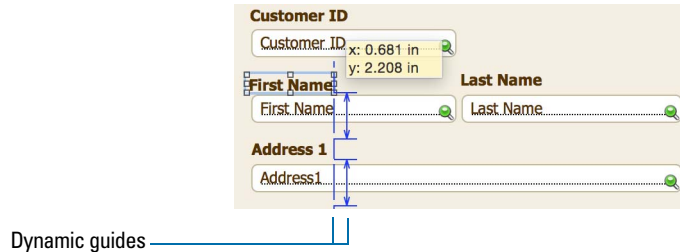
Dynamic guides

Dynamic guides also appear when you use the keyboard to move objects, but they do not "snap to" objects when you move them this way.

To use dynamic guides:

- To turn on dynamic guides, in Layout mode, choose **View** menu > **Dynamic Guides**.
- To turn off dynamic guides, choose **View** menu > **Dynamic Guides** again.

Screen stencils

You can display guides that help you design layouts optimally for iPad, iPhone, and common desktop resolutions. You can also create screen stencils with custom dimensions.

To display a screen stencil, click the arrow on **Screen Stencil** in the layout bar, then choose a size from the list. You can display more than one screen stencil at a time on the same layout. To create a screen stencil, choose **Custom Size** from the menu.

Rulers

Guides

Screen
stencil
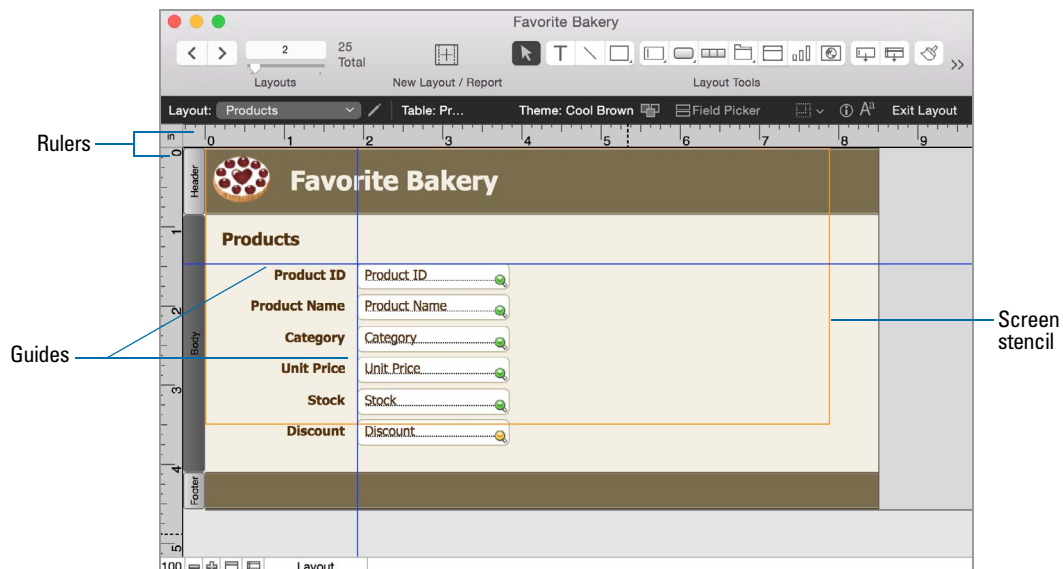
Selecting objects

To work with an object on a layout, select it in Layout mode. You see small squares, or *handles,* surrounding the selected object.

Handles surround a selected object
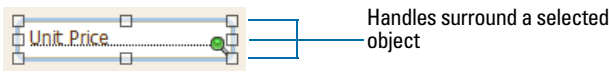
Note If an object's selection handles display as ✖ , the object is locked and can't be changed.

To select an object, click the **Selection tool** ▶ in the status toolbar. The pointer becomes an arrow pointer. Then do one of the following.

To select	In Layout mode, do this
One object	With the arrow pointer, click the object. (If the object is transparent, click its border.)
Several objects at once	Drag the arrow pointer to make a selection box that includes the objects. The selection box does not have to completely surround the objects. To avoid including partially selected objects, press Ctrl (Windows) or ⌘ (OS X) as you drag. Or, press Shift as you click each object individually.
All objects on the layout	Choose **Edit** menu > **Select All**.
All objects of the same type (for example, all text objects or all rectangles)	Click the tool for the type of object to select, then choose **Edit** menu > **Select All**. This method does not select buttons. Or, with the arrow pointer, click a field, press Shift (Windows) or Option (OS X), and choose **Edit** menu > **Select All** (Windows) or **Select Same** (OS X).
All fields	With the arrow pointer, click a field, press Shift (Windows) or Option (OS X), and choose **Edit** menu > **Select All** (Windows) or **Select Same** (OS X).
A portal	With the arrow pointer, click the border of the portal, or any other area within the portal that doesn't contain a field or object.
Other types of objects	See Help.

To deselect selected objects, click a blank area of the layout or any tool in the status toolbar. Or, press Shift and click selected objects.

Working with fields on a layout

After you've added fields to a file, you can place the fields on a layout, remove fields, determine control settings for data entered in fields, and determine a display format for data.

Fields on a layout are objects, which you can select, move, resize, and reshape. In Layout mode, each field displays its field name, formatted with its attributes for font, size, style, alignment, line spacing, and color. All fields except container fields display text baselines to indicate where the data appears in Browse mode and to help you align fields with each other.
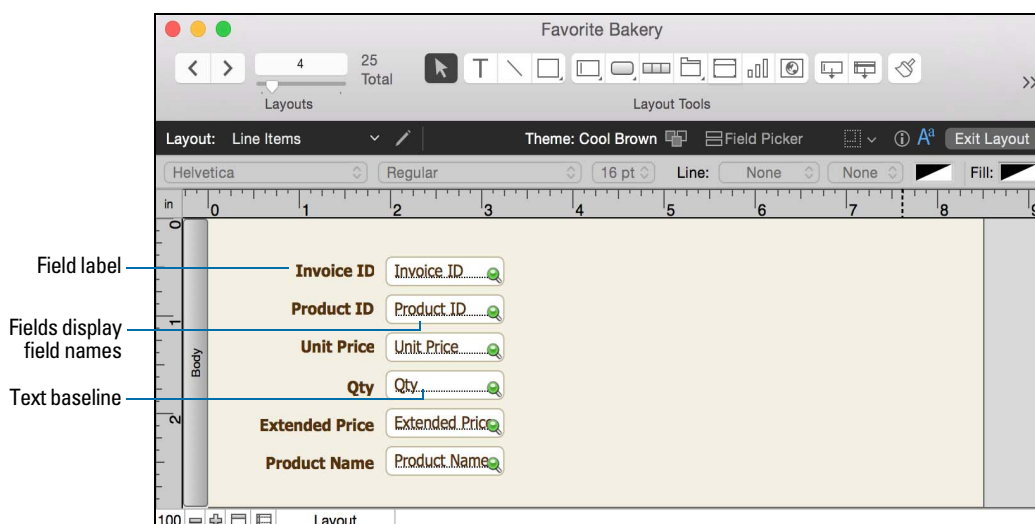
Note As long as you haven't deleted a field from the database, even if the field doesn't appear on a layout, it still exists in the database and its data can be used in calculations and summaries.

Placing and removing fields on a layout

You can place a field anywhere on any layout, as many times as you want. (You can place only fields that you've defined. See "Creating and changing fields" on page 43.)

You get different results by placing the same field in different locations on the layout. For example:

- Add the same summary field to a subsummary part to calculate totals for each group of sorted records, and to a grand summary part to get totals for all the records in a table.

- Add a field to the header or footer part to repeat data from the first record or the last record on the page as a header or footer. (For example, add a Last Name field to the header in a directory.)

- Add the same related field directly on a layout to see the field's value in the first related record, or inside a *portal* to see values from more than one related record. (A portal is a layout object that displays records from related tables.)

Placing a field on a layout

1. In Layout mode, choose the layout from the Layout pop-up menu.

2. Do one of the following:

- Drag a field from the **Field tool** 🖰 in the status toolbar to the layout. As you drag the field to the layout, you see a border and text baselines to help you align the field with other objects on the layout. Release the mouse button when the field is where you want it.

- To display field data in an edit box or a drop-down list, pop-up menu, checkbox set, radio button set, or drop-down calendar, click the arrow next to the **Field/Control tool** ▭ (Windows) or click and hold the **Field/Control tool** ▭ (OS X), then select the type of field or control to add to the layout. Drag the crosshair to draw the field. To format and choose a value list for the field, see "Setting up fields to display checkbox sets and other controls on a layout" on page 74.

- Click ☰ Field Picker in the layout bar. Then see "Creating and changing fields in the Field Picker dialog box" on page 46.

Note   If you're placing a related field in a portal, position it in the first row of the portal. Make sure each field in the portal is from the same related table from which the portal is set up to display records.

3. In the Specify Field dialog box, select the field to place.

To place a field from another table, choose the table ———
Select the field to add ———
Select to use the field name as the field label ———

Specify Field	
Current Table ("Customers") ▾	
Customer ID	
First Name	
Last Name	
Address1	
City	
State	
Country	
Promotion Date	
Event Date	
Address2	
Corporate Address	
☑ Create label ⚙	
OK Cancel	

——— Click to display the Manage Database dialog box
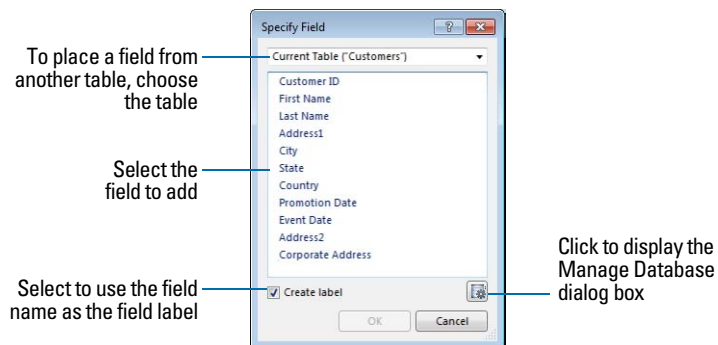
To choose a field in another table, choose the table from the table list above the list of fields. Then select a field from the fields list. Or choose **Manage Database** in the table list, or click 🗄 to create a relationship or table (see "Creating relationships" on page 94).

4. To include the field name as text on the layout, select **Create label**.

5. Click **OK**.

You see the field name in the field on the layout unless you have chosen to display sample data from the current record (by choosing **View** menu > **Show** > **Sample Data**). Fields from related tables appear as **::Field Name** (preceded by two colons).

Replacing a field with another field

In Layout mode, double-click the field, then select another field name in the Specify Field dialog box and click **OK**.

Removing a field from a layout

In Layout mode, click the field to select it, then press Backspace or Delete, or choose **Edit** menu > **Clear**. Removing a field from a layout does not delete the field or its data from your database.

Setting up fields to display checkbox sets and other controls on a layout

You can format fields to display as edit boxes, drop-down lists, pop-up menus, checkbox sets, radio button sets, and drop-down calendars. You can also format fields to auto-complete by suggesting possible matches as the user types data in the field. All of these options aid in data entry.

For example, use a radio button set to display a *value list* of frequently used text, number, date, or time values. During data entry, users can choose from the defined values rather than type the values.

Value list attached to Category field

To set up a field to display a pop-up menu, checkbox set, or other control:

1. In Layout mode, select the field.

- If the field isn't already on the layout, see "Placing and removing fields on a layout" on page 72.
- If the field hasn't been defined yet, choose **File** menu > **Manage** > **Database** to define a new field.

2. Click **Inspector** ⓘ in the layout bar, then click **Data**.

3. In the Field area, choose from **Control Style**.

When you choose different control styles, you see different options in the Inspector. For example, you can choose the icon that indicates that a checkbox is selected.

4. Choose a value list from the **Values from** list.

To create a value list, click 🖊 next to the **Values from** list.

5. Choose options for the value list, if desired.

6. To display data from a different field, click 🖊 next to **Display data from**.

In the Specify Field dialog box, select the field to display data from. To include the field name as text on the layout, select **Create label**. Click **OK**.

7. Save the layout.

Deciding where to place related fields

You can place related fields directly on layouts or in portals.

- **Directly on layouts:** Place related fields directly on a layout to display data from the first related record, even when there are multiple related records that match the criteria of the relationship. (The first related record that's displayed is determined by whether the relationship specifies a sort order. For more information, see "Creating relationships" on page 94.)

- **In portals:** Place related fields within a portal on a layout to display data from all related records that match the criteria of the relationship.

Note Before placing related fields on a layout, you should understand the concepts presented in chapter 4, "Working with related tables and files."

About merge fields

Use merge fields to combine field data and text in documents like form letters, labels, envelopes, or contracts. You create merge fields in text blocks, which allows you to use static text and field data together.
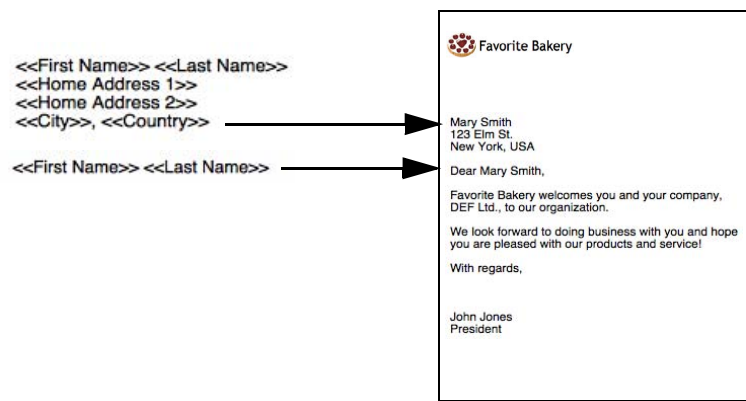
Each form letter will include a different address and salutation

Merge fields shrink or expand to fit the amount of text in the field for each record. For example:

- When the merge field <<First Name>> is between the text Dear and a colon, (as in **Dear <<First Name>>:**), FileMaker Pro displays **Dear Charles:** in Browse mode or Preview mode if the First Name field contains `Charles`.

- When a merge field is on a line by itself (such as an empty Address Line 2 field in a mailing label), FileMaker Pro removes the blank line from the text block.

FileMaker Pro uses merge fields to create Labels and Envelopes layouts. See "Creating Labels and Envelopes layouts" on page 58.

Note You can also use a merge variable to display data.

Formatting field data on a layout

Use FileMaker Pro field formats to control how text, numeric, date, time, and timestamp data appears on a layout, how results are displayed in calculation and summary fields, and how images and file icons are displayed in container fields. The formats you specify don't change the data as it's stored in the database, and you can specify different formats each time you place a field on a layout (whether it's on the same layout or a different layout). For example, if you enter `-5123` into a number field, you can format it in one place to display as **–$5,123.00** and in another place as **<5123>**.

To specify formats for text, see the next section. To specify formats for number, date, time, timestamp, and container fields, see Help.

Specifying text formats for fields

You can specify a set of text character attributes for each field. All the characters in that instance of the field (including all repetitions of repeating fields) share the same font, size, style, color, line spacing, tab, and paragraph settings.

You can also format characters in text fields in Browse mode (for example, italicize or underline a word for emphasis). Unlike text formatting specified in Layout mode, this formatting is stored with the data, and you see it in any layout that displays that field.

1. In Layout mode, select one or more fields.

2. Click **Inspector** ⓘ in the layout bar, click **Appearance**, then specify formats for the field.
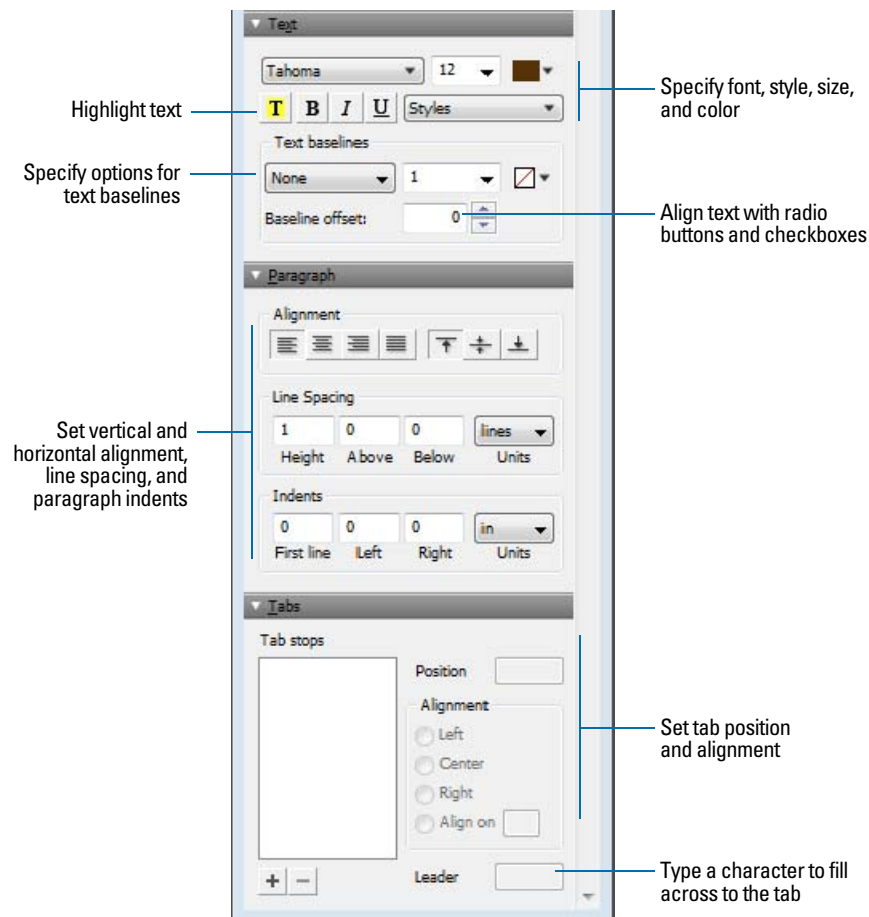
Inspector options for text in Windows

3. Click outside the Inspector to apply the changes.

Formatting fields and text for vertical writing

If your operating system is configured to support Japanese text entry, you can format field objects and text objects that display Japanese text in vertical writing format. In vertical writing, characters are displayed and read from top to bottom, with successive columns displayed vertically from right to left. This is useful when printing addresses on labels.

When you select one or more fields, then choose **Format** menu > **Orientation** > **Sideways (Asian text only)**, the characters are rotated 90 degrees counter-clockwise within the field. The field itself is not rotated. To rotate the selected fields, choose **Arrange** menu > **Rotate**.

Depending on how you want the text to print, you can change the page orientation of the layout. To do so, choose **File** menu > **Print Setup** (Windows) or **Page Setup** (OS X), and change the page orientation to landscape or portrait.

Allowing or preventing entry into fields

You can allow or prevent entry into a field. For example, you can restrict entry into a field containing a *serialized number*, so the field can't be modified. You can set separate Browse mode and Find mode data entry options, which would allow finding serialized numbers even though they can't be entered.

If you allow entry into a field, you can also control whether the entire contents of the field is selected when you click or tab into the field in Browse mode or Find mode. Otherwise, FileMaker Pro places the insertion point after the last character in the field.

1. In Layout mode, select one or more fields.

2. Click **Inspector** ⓘ in the layout bar, then click **Data**.

3. In the Behavior area, for **Field entry**, select the following options:

To	Do this
Prevent entry into a field in Browse mode	Clear **Browse mode**.
Prevent entry into a field in Find mode	Clear **Find mode**.
Select the entire field's contents when the field is entered	Choose **Select entire contents on entry**.

Working with layout parts

FileMaker Pro layouts are divided into *layout parts*, sections of the layout that determine how data in a field is treated and displayed. By using parts, you can control how FileMaker Pro prints data, for example:

- once for each record

- only at the top of each page

- only before or after groups of sorted records (for example, to include a subtotal for each group of records)

Each layout must have at least one part. Layout parts can contain fields, portals, buttons, text, charts, and other objects. In Layout mode, gray horizontal lines mark the division between layout parts (part boundaries), and the part labels appear in the left margin of the layout or directly in the part above the part boundary.

Parts are assigned styles that are defined by the theme of the layout. You can use the Inspector to customize part styles.

The New Layout/Report assistant automatically creates the appropriate layout parts depending on the choices you make. You can add, change, or delete layout parts after you finish the assistant as needed. (See "Creating layouts and reports" on page 54.)

Header

Body

Subsummary

Trailing grand summary

Footer

Display part labels vertically or horizontally

A subsummary below the body summarizes data for each group of records sorted on the break field (Salesperson)

Trailing grand summary

Footer

About layout part types

The following table describes layout part types.

Layout part	Description
Top navigation	Appears at the top of every screen and can contain buttons or other controls. This part cannot be scrolled or zoomed in or out, and it does not print or display in Preview mode. Fields added to a top navigation part use data from the current record. You can have only one top navigation part on a layout.
Title header	Appears only once at the top of the first screen or page and replaces the normal header (if one is specified). In reports, can be used to print a separate title page. You can have only one title header in a layout.
Header	Appears at the top of every screen or page (unless you add a title header, which supersedes the header on the first page). Use for titles or column headings (in columnar reports). You can have only one header in a layout.
Body	Each object you put in the body, including fields, text objects, and graphics, appears once for each record in the found set. You can have only one body in a layout.
Footer	Appears at the bottom of every screen or page (unless you add a title footer). You can have only one footer in a layout.
Title footer	Appears only once at the bottom of the first screen or page and replaces the normal footer (if one is specified). You can have only one title footer in a layout.
Bottom navigation	Appears at the bottom of every screen and can contain buttons or other controls. This part cannot be scrolled or zoomed in or out, and it does not print or display in Preview mode. Fields added to a bottom navigation part use data from the current record. You can have only one bottom navigation part on a layout.

To include summary data on a layout (for example, subtotals, grand totals, averages, counts, and so on), the assistant places summary fields in summary layout parts. If you want to modify a report to add summary data, you can place summary fields in summary layout parts (see "Creating summary fields" on page 49).

Summary parts include grand summary and subsummary parts.

- A *grand summary part* usually contains one or more summary fields that display summary information (like totals) about all records being browsed.

- A *subsummary part* usually contains one or more summary fields that display "subsummary" information (like subtotals) for a subset of records. The records are grouped (sorted) by values in another field—the *break field*. Whenever the value in the break field changes, FileMaker Pro summarizes the values in that field across all records and displays the summarized data in Browse and Preview modes or data is printed as a report. For example, to display the number of items in stock by product, place the Product Name field in a subsummary part, and place the Product Name and Stock fields in the body part.

Place the Product Name break field in a subsummary part in Layout mode

The number of items for each product in stock is displayed in Browse and Preview modes or when data is printed as a report

Subsummary parts appear in Table View and List View when sorted by break fields, and update dynamically whenever data in the file is changed.

Creating and editing charts

You can create various types of charts in FileMaker Pro to compare data graphically. Before you create a chart, think about the data comparison that you want to emphasize, then choose the FileMaker Pro chart type that will show the comparison clearly.

Use	To
Column chart (vertical) or bar chart (horizontal)	Compare increases to decreases, highest with lowest, how many, or how often. For example, show monthly sales for several products.
Stacked column chart (vertical) or stacked bar chart (horizontal)	Compare parts to the whole. For example, compare annual sales figures over several years.
Positive/negative column chart	Compare positive and negative values. For example, compare earnings to losses.
Pie chart	Compare percentages of individual parts within the whole. For example, show the percentage of each product sold within total sales.
Line chart	Show data that changes continuously over time, such as historical financial data.

Use	To
Area chart	Compare data that trends over time while emphasizing highs, lows, and movement between data points. For example, show sales totals or averages.
Scatter chart	Plot x and y coordinates as individual values to reveal correlation patterns. For example, compare target wait time to actual wait time at a call center.
Bubble chart	Compare individual data points in terms of size. For example, compare market share by charting the number of products sold, sales figures per product, and percentage of total sales in each data point.

Creating a chart

The following steps describe how to create a *quick chart*, which FileMaker Pro sets up for you based on the field(s) you've selected in Browse mode. When you create a quick chart, FileMaker Pro sets up the chart based on the selected fields, field type, the contents of the active field, and the sort order you specified.
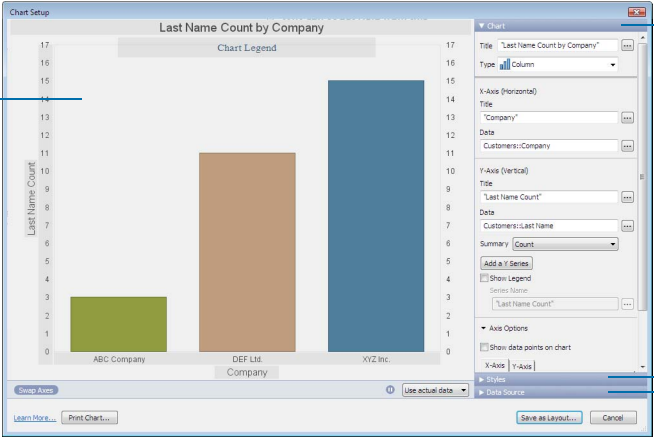
Note   You can also create charts in Layout mode.

The following example describes how to create a chart that counts and compares the number of customers in each company that has an account with your business.

1. Open the file in which to add the chart, then switch to Table View.

2. Sort the column containing the data to emphasize.

For example, to emphasize your customers' companies, right-click the **Company** column and choose **Sort Ascending**.

3. Choose the column containing the data to compare.

For example, to compare the number of customers in each company, right-click the **Last Name** column and choose **Chart** > **Chart Last Name by Company**.

The Chart Setup dialog box appears with a preview of a column chart that shows the number of customers in each company.

Chart preview

4. You can choose settings in the Chart inspector on the right to modify the chart, and preview the result of your changes in the Chart Setup dialog box.

To	Do this
Add a title to the chart	With the **Chart** options displayed, for **Title**, type or change the chart title, or click ⋯ to specify a title. For example, "Accounts by Company."
Choose a chart type and specify the data series	For **Type**, choose a chart type. For example, choose **Pie**.
Change data labels, show or hide tick marks and set tick mark scale (if applicable), and format data	Select additional chart options. For example, select **Show Legend**, **Show values on chart**, and **Percentages**.
Change the color scheme, legend, or fonts in the chart	Click **Styles**, then make your changes. For example, choose **Shaded-3D** for the chart style, **Earth** for the color scheme, and Arial boldface black for the font settings.
Specify the type of data the chart uses (records in the found set, delimited records, or related records)	Click **Data Source**, then choose a data source. For example, choose **Current Found Set**.

5. Choose **Layouts** menu > **Save Layout**, then click **Exit Layout** in the layout bar.
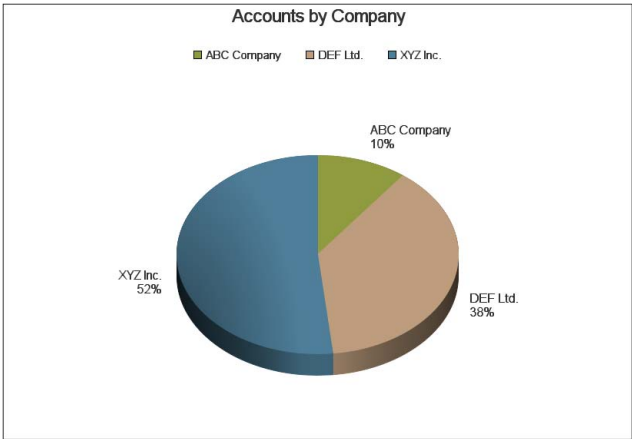
Chart in a layout in Browse mode

Editing a chart

1. Choose the layout containing the chart from the Layout pop-up menu.

2. Switch to Layout mode and double-click the chart.

3. In the Chart Setup dialog box, change settings in the Chart inspector.

4. Click **Done** to close the Chart Setup dialog box.

5. Choose **Layouts** menu > **Save Layout**, then click **Exit Layout** in the layout bar.

Chapter 4
Working with related tables and files

This chapter explains the basics of how to:

- plan a relational database
- create and edit relationships
- create and edit lookups

FileMaker Pro uses related tables as the basis for *relational databases* and *lookups*. Relational databases allow you to work with data from other tables dynamically, so that when you change data in one place, your changes are reflected in all places where the related data appears. Lookups let you copy and paste data from one table to another; once looked-up data has been inserted, it does not change unless you edit it or tell FileMaker Pro to look it up again.

Use relational databases to:

- See and work with data from another (or the current) table in its most up-to-date state. For example, display data in related fields when you need current data from a related table, such as the current price of an item. As data changes in the related records, you see those changes in the current table.

- Set up and manage data efficiently and with flexibility. Instead of creating many database tables or files with duplicate values, you store single occurrences of values and use relationships to make those values available. You can then make changes to data in only one place, which eliminates data duplication and promotes data accuracy.

- Save disk space, because data is stored in only one place.

Use lookups to copy data from a related table and keep it as copied, even when the related data changes. For example, use a lookup to copy the price of an item at the time of purchase into an Invoices table. Even if the price in the related table changes, the price in the Invoices table stays the same.

FileMaker Pro can also access data stored in other FileMaker Pro files and external ODBC data sources, which allows you to combine data stored in your FileMaker Pro file with data from these external sources. You can work with data in SQL databases that share information through ODBC. You can also use supplemental fields in FileMaker Pro to perform calculation and summary operations on data stored in ODBC data sources. For more information about using FileMaker Pro with external data sources, see "Working with external data sources" on page 108.

For information about solution, see "Planning a solution" on page 37.

Note See Help for detailed, comprehensive information and step-by-step procedures about using FileMaker Pro.

About relationships

A relationship is a powerful method for organizing your data. Using a relationship, you can join data in one or more tables based on common field values, different field values, or a comparison of values in two or more fields.

After you create a relationship, you can do either of the following to display the data from the related table:

- Design a relational database, which is one or more tables that, when used together, contain all the data you need for your work. Each occurrence of data is stored in only one table at a time, but can be accessed and displayed from any related table. You can change any occurrence of your related data, and the changes appear in all places where that related data is used.

- Define a lookup to copy data from a related table into a field in the target table. The copied data is now stored in two places, just as if it were copied and pasted into a target field. Looked up data is current at the time it is copied, but once copied it remains static unless it is re-looked up or the lookup is triggered again.
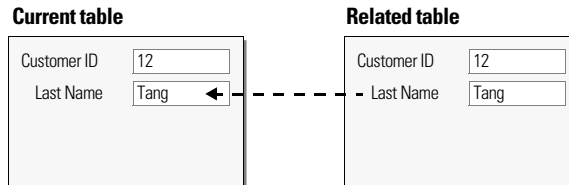
**In relational databases, data from the related table is only
displayed in the current table, *not* copied**
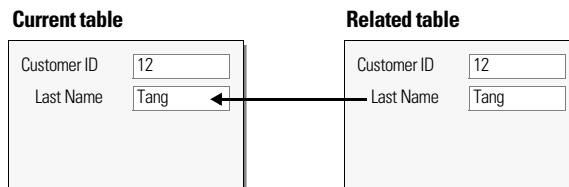
Lookups copy data from the related table into the current table

For example, a database for a bakery might have these tables: a Products table, which stores information about bakery products and their current prices; a Customers table, which stores customer information such as customer names and contact information; an Invoices table, which keeps a record of each order; and a LineItems table, which stores sales data for each line of the invoice, including the item being sold and the price at which it is sold. Because invoices are a mix of dynamic and static data, you use both relational databases and lookups to display your data. Records from the LineItems table are displayed dynamically, in a portal on the Invoices layout, but the actual sales price of each line item is entered using a lookup, so the invoice totals remain historically accurate, even if prices change at some future date.

Products table

Product ID	FB7
Product Name	Fruitcake

Bakery ID	Location	Ships From
B20	France	Paris
B46	Italy	Roma

Customers table

Customer ID	3
Last Name	Williams
Phone	408-555-3456

Product ID	Product Name
FB7	Fruitcake
FB2	Chocolate Cake

Invoices table

Invoice ID	003
Date	16-Oct-2012
Customer ID	3
Last Name	Williams

Product ID	Product Name	Unit Price$
FB7	Fruitcake	$15.50
FB2	Chocolate Cake	$22.50
	Total	$38.00

Records from the LineItems table displayed in a portal

You create a relational database by defining a relationship between two fields, called *match fields*. These fields can be in different tables or they can be in the same table (a self-join). You are able to access related data when the value in the match field(s) on one side of the relationship compares successfully with a value in the match field(s) on the other side of the relationship, according to the criteria you establish in the relationship.

After you have created a relationship, you can use fields from the related table just as you would use any fields in the current table: to display data on a layout, as part of a calculation formula, in a script, as a match field for another relationship, and so on. You can work with the data in the related fields in all modes (if you have access privileges) when you work with records in the current table.

When you display related data in a portal, values from all related records are displayed. When the related field isn't in a portal, the value from the first related record is displayed.

Relational database terminology

Before you begin working with relational databases and lookups, you should understand the following terms. These terms are explained in the sections that follow.

Term	Description
Current table	For relational databases, the table that you are currently working in. For lookups, the table that the data is copied to.
External table	A table outside of the current file, in another file.
Lookup target field (for lookups only)	The field in a table that you want data copied to during a lookup.
Lookup source field (for lookups only)	The field in the related table that contains the data you want copied during a lookup.
Match field	A field in the current table and a field in a related table that each contains values used to access matching records. (A match field is sometimes called a *key field*.) For each relationship, you select one or more match fields in each table. For relational databases, values in match fields must match each other in some way for a relationship to be established between the files. See "About match fields for relationships" on page 88. For lookups, values in match fields do not have to be equal to match.
Portal	A layout object that displays records from related tables. Portals display data from related fields in rows, one record in each row.
Related field	A field in one table that is related to a field in another table (or to a different field within the same table). If a relationship has been created between two tables (even through another table), data in fields in one table can be accessed from the other table.
Related record	A record in the related table whose match field (according to the relationship used) contains a value that matches the value in the match field of another table.
Related table	For relational databases, the table that contains the data you want to access and work with in the current table. For lookups, the table that contains the data to copy. A table can be related to itself. This is called a *self-join*.
Relational operators	In the relationships graph, the symbols that define the match criteria between one or more pairs of fields in two tables. These include: equal (=), not equal (≠), greater than (>), greater than or equal to (≥), less than (<), less than or equal to (≤), and all rows, or cartesian product (X).
Relationship	Relationships provide access to data from one table to another. Relationships can join one record in one table to one record in another table, one record to many other records, or all records in one table to all records in another table, depending on the criteria you specify when you create the relationship in the relationships graph. (A relationship is sometimes called a *link* or a *join expression*.)
Relationships graph	In the Relationships tab of the Manage Database dialog box, you can see the occurrences of tables both in the current file and from any external, related database files. In this relationships graph, you join tables and change relationships between fields in different tables. When you create a new table, a visual representation, or occurrence, of the table appears in the relationships graph. You can specify multiple occurrences (with unique names) of the same table in order to work with complex relationships in the graph.
Source file	The file from which you add a table to the relationships graph.
Source table	The table upon which one or more tables in the relationships graph are based. The source table is the table defined in the Tables tab of the Manage Database dialog box.

About the relationships graph

When you work with tables in the relationships graph, you organize your view of your data. Tables shown in the relationships graph can be located in the current FileMaker Pro file, in an external FileMaker Pro file, or in an external ODBC data source.

Each table occurrence in the relationships graph represents a separate view into your data. When you join two tables, you are leveraging the two existing views to create a third view. As you add tables to your relationships, each successive table represents an additional set of criteria that must be met before related data can be accessed in that relationship.

You can create a relationship between any two tables in the relationships graph, but the relationship must not create a cycle, or closed loop between tables. That is, each series of relationships must have a starting table and an ending table, and those tables must be different tables.

Because each relationship represents an additional set of criteria, you must be aware of your *context* within the relationships graph. Context is the point in the graph from which a relationship is evaluated. Because the graph is never a cycle, each point along the graph offers a different perspective into your data.

Because FileMaker Pro does not permit you to create cycles within the relationships graph, any attempt to create a cycle causes FileMaker Pro to generate a new, uniquely named table occurrence. A new occurrence functions like any other occurrence in the graph and allows you to continue with your new relationship.

About match fields for relationships

When you create a relationship between tables, you choose one or more fields in each table as *match fields*. Match fields usually have common values. In a typical relationship, a record in one table will be related to records in another table that share a common match field value.

For example, a Customers table and an Invoices table can each use the field Customer ID to uniquely identify each customer and purchase. If the two tables are related using Customer ID as the match field, a record in the Customers table can display a portal showing each invoice with a matching Customer ID, and in the Invoices table, each invoice with the same Customer ID can display consistent customer data.

The match fields used in a relationship can have different names. Match fields can be any field type except container or summary.

Types of relationships

When you join two tables using a relationship, you establish criteria that FileMaker Pro uses to display or access related records.

Your criteria can be simple, such as matching a field in Table A with a field in Table B, or more complex. A more complex relationship definition will usually return a narrower set of related records. Examples of complex relationships include using multiple match fields on one or both sides of the relationship, comparing match fields using non-equal relational operators, or using calculated match fields.

Single-criteria relationships

In a single-criteria relationship, data in one field is matched to data in another field.

For example, a record in either table is related to any record in the other table when the values TextFieldA and TextFieldB are the same.
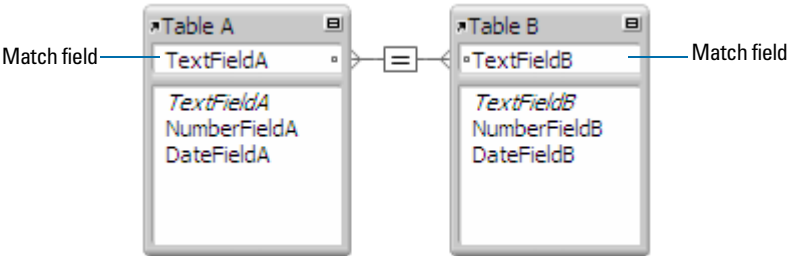
Use a single-criteria relationship to relate two tables based on a single common value, such as a serial number or an ID number. For example, a database has two tables: Customers, which stores names and addresses, and Contacts, which stores phone numbers, types of phone numbers (such as work, home, fax, and so on), and email addresses. The data is split between two tables because a single customer can have multiple phone numbers and email addresses.

The tables have the following fields:

Table	Field name	Comment
Customers	Customer ID	Number field, auto-enter serial number; this will be the match field in the Customers table
	First Name	Text field
	Last Name	Text field
	Address1	Text field
	City	Text field
	State	Text field
	Country	Text field
Contacts	Phone Number	Text field
	Phone Type	Text field
	Email Address	Text field
	Email Type	Text field
	Customer ID	Number field; this will be the match field in the Contacts table

The Customer ID field is the match field in the relationship between the two tables. In the Customers table, the Customer ID field is set to auto-enter a serial number, giving each record in the Customers table a unique ID number. In the Contacts table, the Customer ID is a simple number field.
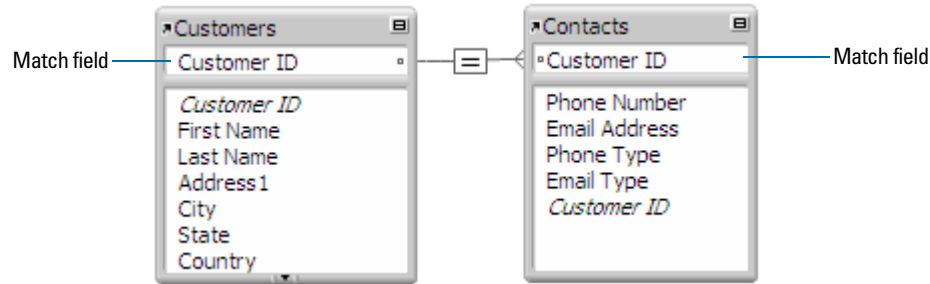
Because the relationship is defined to allow the creation of related records in the Contacts table, the Customer ID number from a Customers record will be automatically inserted in the Customer ID field in the Contacts table in each new related record. This allows many records in the Contacts table to be related to a single record in the Customers table.

You can then add a portal to the Contacts table on the Customer layout. When you enter a phone number or an email address in an empty portal row in the Customers table, FileMaker Pro creates a related record for that phone number or email address in the Contacts table.

Multi-criteria relationships

In a multi-criteria relationship, you increase the number of match fields, which increases the criteria that FileMaker Pro evaluates before successfully joining related records. In a multi-criteria relationship, FileMaker Pro compares the values from each match field on each side of the relationship in the order in which the fields appear. This is called an AND comparison; to match successfully, every match field must find a corresponding value in the other table.
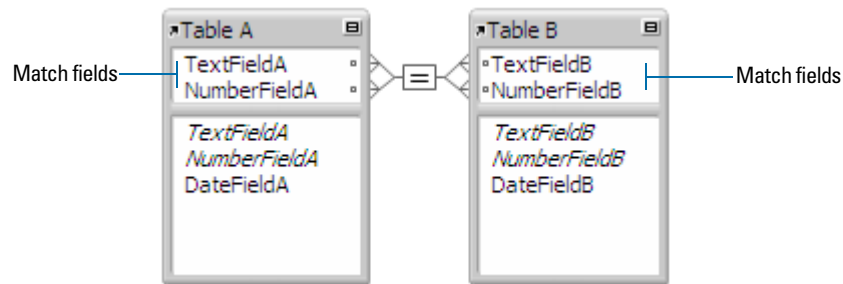
In this relationship, both TextFieldA and NumberFieldA are match fields to TableB. A record in TableA with a TextFieldA value of Blue and a NumberFieldA value of 123 will only match those records in TableB where both TextFieldB and NumberFieldB have values of Blue and 123, respectively. If TextFieldA and TextFieldB have matching values, but NumberFieldA and NumberFieldB do not, no related records are returned by the relationship.

Use a multi-criteria relationship to relate two tables based on more than one common value, such as a customer ID and a date.

For example, a catering equipment rental database has three tables: Equipment, a static table that stores equipment rental inventory; Customers, which stores customer names and addresses; and Catering Line Items, which stores a record of each equipment rental, including the equipment ID, the customer ID, and the event date. The purpose of this database is to track equipment rentals and display all rentals by a selected customer on a selected date.
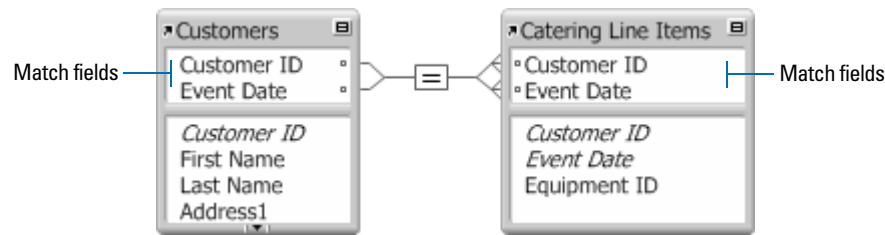
In this relationship, both Customer ID and Event Date are match fields to the Catering Line Items table. A record in the Customers table with a Customer ID value of 1000 and a Event Date value of 10/10/2014 will only match those records in the Catering Line Items table where both fields Customer ID and Event Date have values of 1000 and 10/10/2014, respectively. If Customer ID fields in both tables have matching values, but Event Date fields in both tables do not, no related records are returned by the relationship.

Although the database uses three tables, the multi-criteria relationship is between the Customers and Catering Line Items tables. These tables have the following fields:

Table	Field name	Comment
Customers	Customer ID	Number field, auto-enter serial number; one of the match fields to the Catering Line Items table
	Event Date	Date field; the other match field to the Catering Line Items table
Catering Line Items	Customer ID	Number field; one of the match fields to the Customers table
	Event Date	Date field; the other match field to the Customers table
	Equipment ID	Number field

Because the relationship is defined to allow the creation of related records in the Catering Line Items table, you will be able to enter catering information in an empty portal row, and FileMaker Pro will automatically create a related record for that catered event.

Select to allow creation of related records in Catering Line Items table
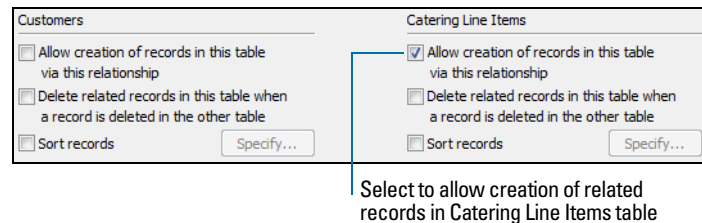
Relationships using comparative operators

In a comparative relationship, you use one or more of the following operators to compare match field values in the two related tables. The relationship returns related records when the comparison evaluates successfully, according to the criteria you establish.

Relational operator	Matches these records
=	Values in match fields are equal
≠	Values in match fields are unequal
<	Values in the left match field are less than values in the right match field
≤	Values in the left match field are less than or equal to values in the right match field
>	Values in the left match field are greater than values in the right match field

Relational operator	Matches these records
≥	Values in the left match field are greater than or equal to values in the right match field
x	All records in the left table are matched to all records in the right table, regardless of the values in the match fields
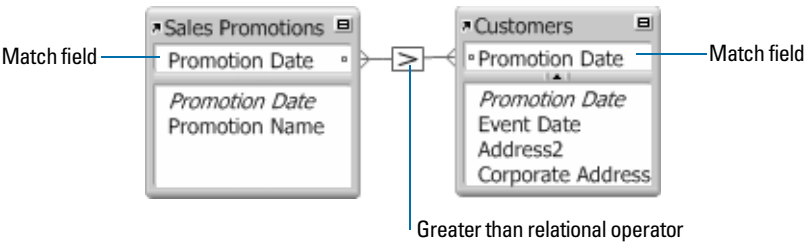
In this example, the Promotion Date fields in the Sales Promotions table and the Customers table are match fields. If a record in the Sales Promotions table has a Promotion Date value of 12/11/2014, all the records in the Customers table with a Promotion Date value of 12/10/2014 or earlier are related to it. In the Customers table, if a record has a Promotion Date value of 12/11/2014, all records in the Sales Promotions table with Promotion Date values of 12/12/2014 or later are related to it.

Relationships that return a range of records

A relationship that returns a range of records is similar to a multi-criteria relationship, except that you use comparative operators to find records that are greater than one of your criteria and less than your other criteria. This type of relationship is commonly used to return records that fall between a range of dates or serial numbers.

For example, from within Table E you want to view all the records in Table F that have Date Field F values that are greater than Starting Date E values and less than Ending Date E.
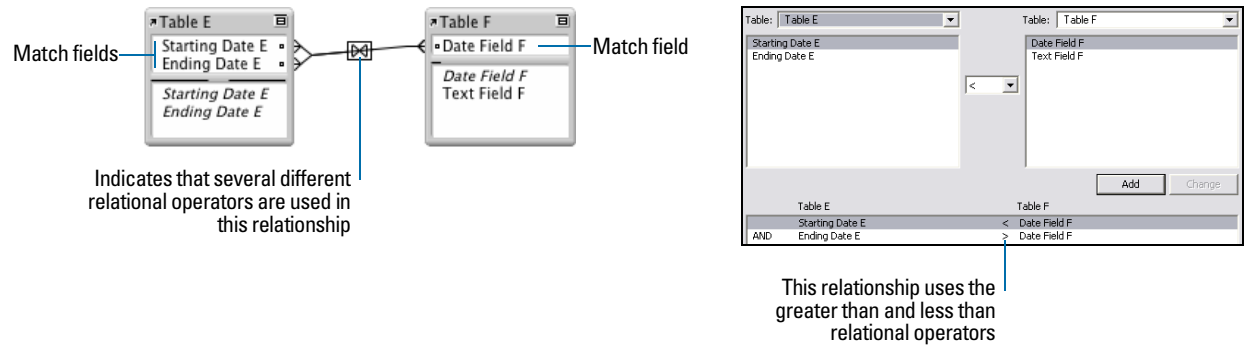
This relationship returns those records from Table F that have a Date Field F value that is later than Starting Date E and earlier than Ending Date E.

For example:

If fields	Contain values	These related records are returned from Table F
Starting Date E	11/01/2014	11/14/2014
Ending Date E	12/01/2014	11/27/2014

Another example:

If fields	Contain values	These related records are returned from Table F
Starting Date E	12/01/2014	12/02/2014
Ending Date E	01/01/2015	12/15/2014
		12/17/2014
		12/26/2014

Self-joining relationships

A self-join is a relationship in which both match fields are defined in the same table. Define a self-join to create relationships between records in the same table. Use a self-join in a portal on a layout of the current table to display a subset of data that is in the current table, such as all the employees of each manager.

When you define a self-joining relationship in the relationships graph, FileMaker Pro generates a second occurrence of the table upon which you are basing the self-join. FileMaker Pro does this to prevent the relationships graph from forming a cycle, which would make it impossible to evaluate the relationship.

Self-joining relationship
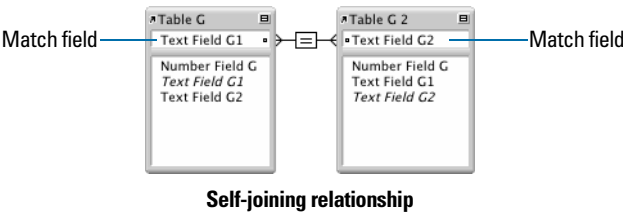
This relationship returns related records in Table G when the value in Text Field G1 is the same as the value in Text Field G2.

Working with the relationships graph

Use the relationships graph to create, change, and view the relationships in your database file. The relationships graph lets you duplicate tables and relationships, resize and align tables, and add text notes. You can highlight tables that are connected to the selected table via a 1-away relationship, and you can highlight tables that have the same source table as the currently selected table.

By default, the relationships graph displays all of the tables in your current database file. You can add tables from other FileMaker Pro files or external ODBC data sources, add more than one occurrence of the same table to the graph, or remove tables from the graph using the buttons at the bottom of the graph.

Note   When the table is from an external ODBC data source, the name of the table is typeset in italics in the relationships graph. To display information about the external data source, move the pointer over the arrow to the left of the table name.

Creating relationships

To create a relationship:

1. With the database open, choose **File** menu > **Manage** > **Database**.

2. In the Manage Database dialog box, click the **Relationships** tab.

3. In the relationships graph, locate the two tables you will be using for this relationship.

They can appear anywhere on the graph but they must be present on the graph in order to create the relationship. For self-joining relationships, locate the single table; FileMaker Pro will create the second table occurrence for you.

4. Drag a field in one of the tables to the corresponding match field in the other table.

Or, you can click ⬚ to open the Edit Relationship dialog box and create a relationship.

5. Repeat step 4 for each match field you intend to use in this relationship.

For more information about match fields, see "About match fields for relationships" on page 88.

6. Click **OK** to save your changes and close the relationships graph.

The relationships graph
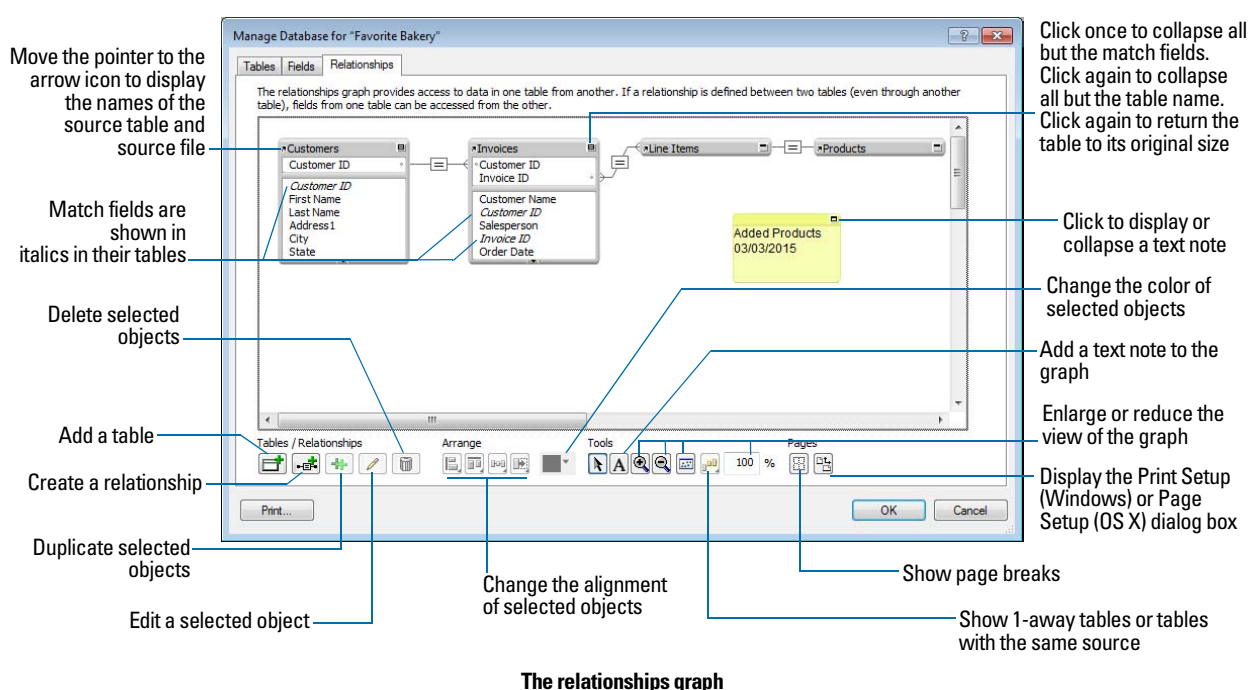
Changing relationships

After you have created a relationship, you can add or change match fields, change relational operators, and set options for creating, deleting, and sorting related records.

To change a relationship:

1. With the database open, choose **File** menu > **Manage** > **Database**.

2. In the Manage Database dialog box, click the **Relationships** tab.

3. In the relationships graph, locate the relationship to edit, and double-click the indicator line between the related tables to open the Edit Relationship dialog box.

Or, you can select the relationship in the graph and click ✐ to open the Edit Relationship dialog box.

Select the relational operator

Select options for the tables in the relationship
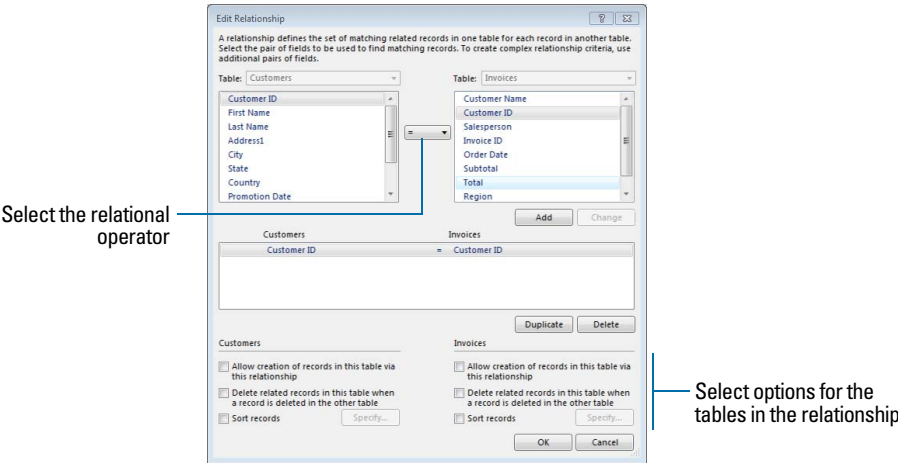
4. Edit tables and match fields for the relationship.

To	Do this
Change a match field	Select the new match field and click **Change.**
Add a match field	Select the new match field and click **Add.**
Change the relational operator	Select a new relational operator from the list and click **Change.** See "Relationships using comparative operators" on page 91.
Duplicate a pair of relationship criteria	Select the paired criteria from the list in the middle part of the dialog box and click **Duplicate.**
Delete a pair of relationship criteria	Select the paired criteria from the list in the middle part of the dialog box and click **Delete** or click the relationships graph and click **Delete**.

5. Select options for the relationship.

To	Select
Add a related record (to the related table) whenever you enter data into a related field in a record of the current table. (See "Adding and duplicating records" on page 22.)	**Allow creation of related records in this table via this relationship.** When this option is selected, entering data in a related field that has no corresponding related record creates a related record based on the match field in the current table.
Delete matching records (in the related table) whenever you delete a matching record in the current table. (See "Deleting records" on page 24.)	**Delete related records in this table when a record is deleted in the other table.** This option deletes related records even when you're browsing a layout that doesn't display the related records.
Sort related records.	**Sort records.** Then, in the left list in the Sort Records dialog box, double-click the fields to sort. To change the order in which fields are sorted, drag fields in the right list into the order you want. Select other options, then click **OK**. Selecting this option does not affect the sort order in the related file.

6. Click **OK**.

About lookups

A lookup copies data from another table into a field in the current table. After data is copied, it becomes part of the current table (and remains in the table from which it was copied). Data copied to the current table does not change automatically when the data in the other table changes, unless the data in the match field of the current table changes.

To establish a connection between tables for a lookup, you create a relationship. Then you define a lookup to copy data from a field in the related table into a field in the current table.

When you type a value in the match field of the current table, FileMaker Pro uses the relationship to access the first record in the related table whose match field contains a matching value. Next, it copies the value from the lookup source field into the lookup target field, where the value is stored.

After a value is copied into the lookup target field, you can edit, replace, or delete it like any other value (because the lookup value belongs to the current table). You can also update data in the current table to match data that changes in the related table.
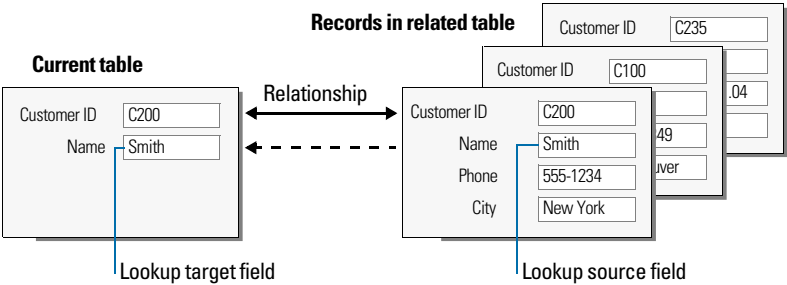
Creating lookups

To create a lookup:

1. Create a relationship for the lookup between the match field of the current table and the match field of the related table. See "Creating relationships" on page 94.

2. With the database open, choose **File** menu > **Manage** > **Database**.

3. In the Manage Database dialog box, click the **Fields** tab.

4. If your database contains more than one table, select the appropriate table from the **Table** list.

5. Select a text, number, date, time, timestamp, or container field from the list of existing fields, or define a new one.

6. Click **Options** (or double-click the field name).

7. In the Options for Field dialog box, click the **Auto-Enter** tab, then select **Looked-up value**.

8. In the Lookup for Field dialog box, choose the table the lookup will start with, and the table from which the value will be copied.

Select	To specify
Starting with table	The table the lookup will use as its starting point in the relationships graph
Lookup from related table	The related table from which the related data will be looked up

9. Select the field from which the lookup value will be copied.

10. Select options for the lookup.

To	Do this
Specify an action when values in the match fields do not match exactly	For **If no exact match, then**, select an option to copy no value, copy the next lower or next higher value that's in the lookup source field, or enter a fixed value to be used instead
Prevent null (empty) data in the lookup source field from being copied to the lookup target field	Select **Don't copy contents if empty**. (Clear this option to allow empty data to be copied.)

Select the lookup's starting point

Choose the related table for the lookup

Select the lookup source field

Select an option for non-equal data in match fields

When selected, prevents null data from being copied
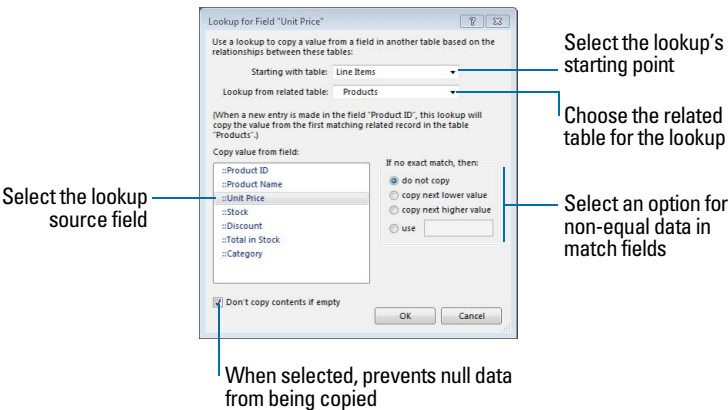
11. Click **OK**.

12. Repeat steps 5–11 for each additional field for which you want to define a lookup.

Editing lookups

To edit a lookup:

1. With the database open, choose **File** menu > **Manage** > **Database**.

2. Click the **Fields** tab.

3. If your database contains more than one table, select the appropriate table from the **Table** list.

4. Double-click the lookup target field.

5. In the Options for Field dialog box, click the **Auto-Enter** tab.

6. Be sure **Looked-up value** is selected and click **Specify**.

 To stop or suspend using a lookup, clear **Looked-up value**.

7. Make your changes.

8. Click **OK**.

Chapter 5
Sharing data

This chapter explains the basics of how you can share FileMaker Pro databases:

- **FileMaker Network sharing:** You can share FileMaker Pro databases on your network, which allows up to 5 FileMaker Pro and FileMaker Go users to access and use the same database file simultaneously. If you want to share a database with more than 5 users, host the database using FileMaker Server.

- **Importing and exporting data:** You can exchange information between FileMaker Pro and other applications by importing and exporting data. For example, you can import data that is in another database or spreadsheet program, or export address data in order to create personalized form letters with a word processing program.

- **Recurring import:** You can set up a FileMaker Pro file to automatically update data imported from another application, such as Microsoft Excel.

- **Accessing data from external data sources:** You can access information stored in other FileMaker Pro files and external SQL databases that use ODBC technology to share data. This allows you to work with information stored in external databases and combine external data with information stored in your file. When you access data from an ODBC database, you can use supplemental fields in your FileMaker Pro file to perform calculations and summary operations on the data without changing the schema of the external file.

- **Publishing FileMaker Pro layouts:** If you have FileMaker Server, you can use FileMaker WebDirect to quickly and easily publish layouts from your FileMaker Pro solutions in a web browser.

Note   See Help for detailed, comprehensive information and step-by-step procedures about using FileMaker Pro. See *FileMaker WebDirect Guide* for information about publishing databases on the web.

Sharing databases on a network

If your computer is connected to a network, you and other Windows and OS X FileMaker Pro and FileMaker Go users can use the same database file simultaneously.

FileMaker Pro Network sharing supports the sharing of files with up to 5 concurrent users (not including the host). FileMaker Go clients are included in the limit of 5 users. To support more users and web publishing technologies such as XML, PHP, and FileMaker WebDirect, use FileMaker Server.

Important   Your FileMaker Pro licensing agreement requires that you pay for a license for each separate computer on which the FileMaker Pro application is installed or run. The software license may not be shared or used concurrently on different computers. Please read the software license for complete terms and conditions.

The first person to open a shared file is the *host*. Any user who opens a shared file after the host is a *client*.

The host opens the file
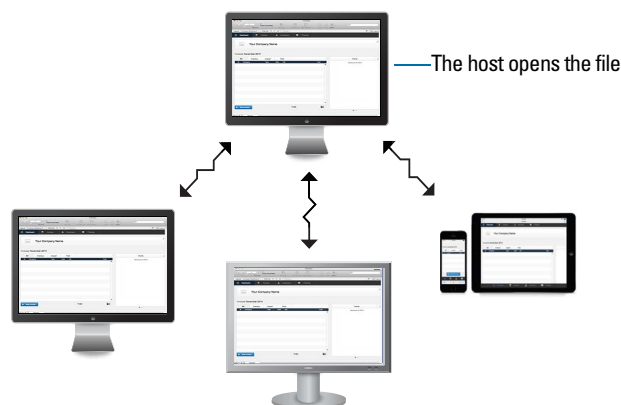
Clients open connections to the shared file

Once a shared file is open, the host and clients have access to the same information, and all changes to the file appear in each user's window.

Modifications to the data made by any user are saved in the shared file. The shared file is saved on the disk where the file resides.

Sort orders, find requests, import and export field orders, and print setups are specific to each user.

Enabling file sharing and hosting files

Because many FileMaker Pro commands are processed on the host machine, you will see better performance if you host your shared files from the fastest available computer. The file you're hosting must be on the hard disk of your computer. Remotely hosting a file stored on another computer or server is not supported, as it might compromise data integrity and will result in poor performance.

To turn on network file sharing for all open files:

1. Open the FileMaker Pro file(s) to share.

Note   To enable or change a file's sharing status, you must open it with an account that has Manage Extended Privileges access privileges. For more information, see "Accounts, privilege sets, and extended privileges" on page 111.

2. Choose **File** menu > **Sharing** > **Share with FileMaker Clients**.

3. In the FileMaker Network Settings dialog box, for **Network Sharing**, click **On**.

For **TCP/IP Address**, you see the TCP/IP address of your system.
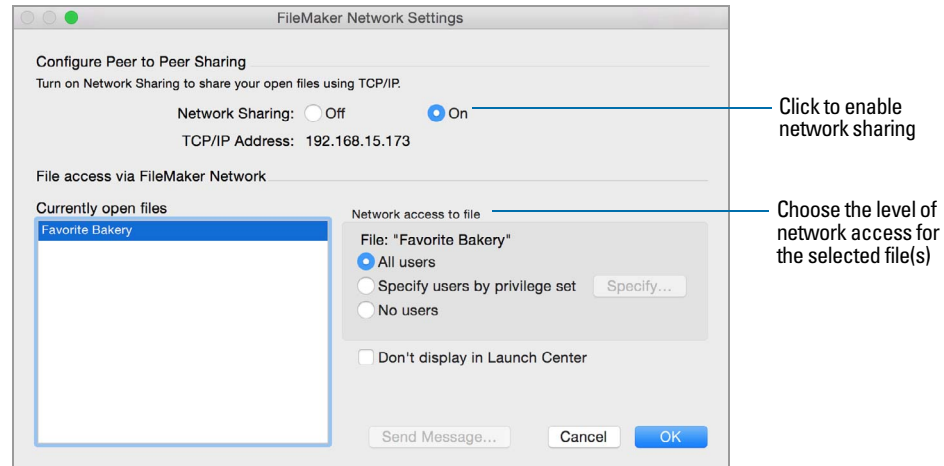
4. Select the file(s) to be hosted from the list of **Currently open files.**

5. Set the level of network access for the file(s).

To	Select
Provide access to all FileMaker Pro and FileMaker Go users on your network	**All users**.
Limit network access to users based on their privilege set	**Specify users by privilege set**, then click **Specify**. In the "Specify users by privilege set" dialog box, select privilege sets.
Prevent any access via FileMaker networking	**No users**.
Prevent a shared file from appearing in the Hosts tab of the Launch Center Window	**Don't display in Launch Center**. Note To access the file through the Launch Center window, in the Hosts tab, click ⚙ , then choose **Network File Path**.

6. Click **OK**.

The open files are now hosted.

Important   You must keep your shared file(s) open to make them available to clients.

Opening shared files as a client

FileMaker Pro databases shared via TCP/IP can be opened remotely using the list of local hosts, the IP address of the host machine, or the DNS name of the host machine (if one has been defined).

Note   You might be required to enter an account name, password, and domain name (Windows only), depending on how file sharing is configured on the host.

To open a shared file using a local host:

1. Choose **File** menu > **Open Remote**.

The Launch Center window opens to the Hosts tab. If hosts aren't displayed, click ▢.

Favorite hosts appear first in the list.

2. To see the files available from a host, click the host name.

To view files in a list, click ≡. To view files as tiles, click ⊞.

3. Select the file you want to open, then click **Open** (or double-click the filename).

To open a shared file using an IP address or a DNS name:

1. In the Launch Center window, click the **Hosts** tab, then click ⚙ and choose **Network File Path**.

2. For **Network File Path**, enter the address and filename of the shared file in this format:

fmnet:/address/filename

For example:

- an IPv4 address: `fmnet:/192.168.10.0/My Addresses`
- an IPv6 address: `fmnet:/[2001:0DB8:85A3:08D3:1319:8A2E:0370:7334]/My Addresses`
- a DNS name: `fmnet:/host.domain.com/My Addresses`

Note that `fmnet:/` uses a single slash.

3. Click **OK**.

Note   When a file you are opening is hosted, you may see an icon that indicates the security level of the connection to the host. Secure connections are encrypted using SSL.

- In the title bar of the Open *Filename* dialog box:
  - 🔓 (Windows) or 🔓 (OS X) means the connection is not encrypted.
  - 🔒 (Windows) or 🔒 (OS X) means the connection is encrypted, but the SSL certificate for FileMaker Server cannot be verified. You may be connected to a server pretending to be your actual destination, which could put your confidential information at risk.
  - 🔒 (Windows) or 🔒 (OS X) means the connection is encrypted with a verified SSL certificate.

- After the file is open, in the lower-left corner of the FileMaker Pro window:
  - No icon means the connection is not encrypted.
  - 🔒 means the connection is encrypted, but the SSL certificate for FileMaker Server cannot be verified. You may be connected to a server pretending to be your actual destination, which could put your confidential information at risk.
  - 🔒 means the connection is encrypted with a verified SSL certificate.

Limitations on changes to shared files

Although it is possible for multiple users to make changes in the same shared file at the same time, there are limits to the types of simultaneous changes that are permitted. For example, two people can't edit the same record at the same time, but they can edit different records at the same time.

Opening shared databases remotely using a URL

The FileMaker Pro installer registers FMP as an Internet protocol. This enables you to open a shared database using a URL. You can also run a script in the shared file using a URL.

To identify the URL for the shared database on the host machine and send it to a client user:

1. In the shared file on the host machine, choose **File** menu > **Send** > **Link to Database**.

FileMaker Pro opens an email message in your default email application that contains the URL for the current database, plus client connection requirements.

2. Address the email message to the client user, then send the message.

To open a shared database on a client machine:

1. Launch a web browser on the client machine.

2. Enter the URL of the host machine in the address bar using the following format:

```
fmp://{{account:password@}address/}filename
```

Optional parameters are indicated by brackets ("{ }").

Examples

fmp://My%20Addresses

fmp://192.168.10.0/My%20Addresses.fmp12

fmp://[2001:0DB8:85A3:08D3:1319:8A2E:0370:7334]/My%20Addresses.fmp12

fmp://MyAccount:MyPassword@192.168.10.0/My%20Addresses.fmp12

Closing a hosted file

Before a shared file can be closed by a host, all clients must close the file. FileMaker Pro allows you to prompt networked clients to close the shared file when you do one of the following: close the file, change the sharing conditions for the file, exit FileMaker Pro, or perform a task that requires all clients to close the file. If a client does not respond to your request to close a shared file within 30 seconds, FileMaker Pro will attempt to close the shared file on the client's machine.

To close a hosted file:

1. On the computer hosting the file, choose **File** menu > **Close**.

2. If any clients have the shared file open, you see a dialog box listing those clients. Click **Ask** to send a message to these clients requesting that they close the file.

If	FileMaker Pro
Clients click **Cancel**	Waits for those clients to close the file
Clients click **Close Now**	Closes the shared file on the client's computer
Clients do nothing	Attempts to close the file after 30 seconds, if it can be closed safely

Sharing files with FileMaker Go clients

FileMaker Go lets you work with FileMaker Pro files on iPad, iPhone, and iPod touch. You work with data interactively: when you change data on an iOS device, the data is updated on the host computer, and vice versa.

Build solutions using FileMaker Pro. Share them using FileMaker Pro or FileMaker Server. Then use FileMaker Go to work with the data on a device. To tailor databases for use with FileMaker Go, see *FileMaker Go Development Guide*, available at http://www.filemaker.com/documentation.

Uploading files to FileMaker Server

You can use FileMaker Pro to transfer database files to FileMaker Server. Before you can upload files, you must have the account name and password for the server administrator or for a group administrator that has the privilege to perform actions on databases. For more information about uploading files to FileMaker Server, see Help.

Importing and exporting data

You can exchange information between FileMaker Pro and other applications by importing and exporting data. You can:

- import data into an existing FileMaker Pro file, either into a new table or into an existing table
- convert data from other applications to new FileMaker Pro files
- export data for use in other applications

Supported import/export file formats

Every application stores its data files in its own file type or file format. Most applications can also exchange information in certain other formats.

FileMaker Pro can import and/or export files in these formats, followed by their filename extensions: Microsoft Excel (.xlsx), tab-separated text (.tab, .txt), comma-separated values (.csv, .txt), FileMaker Pro 12 (.fmp12), Merge (.mer), HTML table (.htm), and XML (.xml). If you're exchanging data with another program, check the documentation that came with that program to determine a common intermediary file format that both FileMaker Pro and the other program support.

Most file formats support data conversion only and do not import or export formatting such as font, size, style, and color.

Setting up recurring imports

You can set up a FileMaker Pro file to automatically update data imported from another application, such as Microsoft Excel. A recurring import occurs automatically the first time you view the layout containing the data from the external file. Later, you can run a script to update data.

ODBC and JDBC

You can exchange FileMaker Pro data with ODBC- and JDBC-compliant applications. For example, you can chart FileMaker Pro data in Microsoft Excel.

What do you want to do?	How do you do it?	See
Use FileMaker Pro as a data source/share FileMaker Pro data	1. ODBC and JDBC 2. SQL queries	*FileMaker ODBC and JDBC Guide* and *FileMaker SQL Reference*
Use FileMaker Pro as an ODBC client/access ODBC data	1. Interactively via the relationships graph 2. One-time, static via ODBC import (or **File** menu > **Open**), also Import Records script step, Execute SQL script step	"Working with external data sources" on page 108 and Help

Methods of importing data into an existing file

When you import data into an existing file, you can:

- add new records to an existing table
- create a new table from imported data
- update existing records in an existing table
- update matching records in an existing table

Important The import options that update existing records and update matching records both overwrite existing data during the import process and cannot be undone. To safeguard your data, choose **File** menu > **Save a Copy As** to make a backup of the file before you perform an import that updates records.

The file you import records from is the *source*. The file you import records to is the *target*.

About adding records

When you add records, you import all records from the source file to the target file or table. A new record is created in the target file for each importable record in the source file.

About updating existing records

With this option, you replace data in your file with data from the source file. For each field you import into, data from the first importable record (or row of data) in the source file overwrites fields in the first record in the target file. Data from the second importable record (or row of data) in the source file overwrites fields in the second record in the target file, and so on. When you replace data, FileMaker Pro doesn't examine or compare the data in the files.

You can choose whether to replace or not replace data on a field-by-field basis.

Records in the target file are replaced with the same number of records from the source file. If there are more importable records in the source file, data from the extra records in the source file will not be imported unless you also choose **Add remaining data as new records**. If there are more records in the target file, data in the extra records in the target file will not be replaced.

About updating matching records

You can update matching records and fields in your target file with data from another file. For example, you might have a copy of a database on your desktop computer and another copy on your laptop computer. You can update the file in your office with the changes you make on the road.

You determine which records in the source file update which records in the target file by choosing one or more match fields in each file. If data in the match field(s) of a record in the target file matches data in the match field(s) of a record in the source file, the record in the target file will be updated with data from the source file.

Match fields must uniquely identify each entity in your database. For example, in a database of people, you could use one match field such as **Employee Number**, or multiple match fields such as **Last Name**, **First Name**, and **Phone Number**. Using **Last Name** alone might identify more than one person, so it isn't a good match field to use by itself.

You also specify the fields to import. The contents of all fields you select to import, in all matching records, will overwrite data in the target file, even if the field in the source file is blank.

When the target file contains a found set, only the found records are updated. (If the source file is another FileMaker Pro file, you can also import only from a found set.)

The following example shows how a record in a target file appears before and after being updated by a matching record in a source file.

Before updating matching records · **After updating**

Source file		Target file	Target file
123-456-7890	=	123-456-7890	123-456-7890
John	–	John	John
Q	–>		Q
Smith	–	Smith	Smith
456 New Rd.	–>	123 Main St.	456 New Rd.
Newtown	–>	Anytown	Newtown
USA	–>	USA	USA
	–	3/3/2015	3/3/2015
	–>	408-555-6789	

◁▷ (OS X) or = (Windows) indicates a match field
▫▷ (OS X) or –> (Windows) indicates to import the field
▫▫ (OS X) or – (Windows) indicates not to import the field

About the importing process

The basic steps for importing records are:

1. Make a backup copy of the target file you're importing into.

2. If the source file is a FileMaker Pro file, perform a find so that the found set in the current window contains only the records to import.

3. Open the target file, and if it has multiple tables, select a layout that shows records from the table to import data into.

  The layout doesn't have to display all the fields in the table. You will be able to specify the fields to import to in the Import Field Mapping dialog box.

4. If you're updating existing or matching records, make sure the found set in the target file contains only the records to change or update.

5. Choose **File** menu > **Import Records** > **File**, and choose the name of the file that contains the data to import (the source file).

6. In the Import Field Mapping dialog box, if necessary, select a table from the **Source** list.

7. Accept the table shown in the **Target** list, or select **New Table** to create a table with the same schema as the source table.

8. Select the type of import to perform. See "Methods of importing data into an existing file" on page 104.

9. Map the fields in the source file to the fields in the target file, and select an import option.
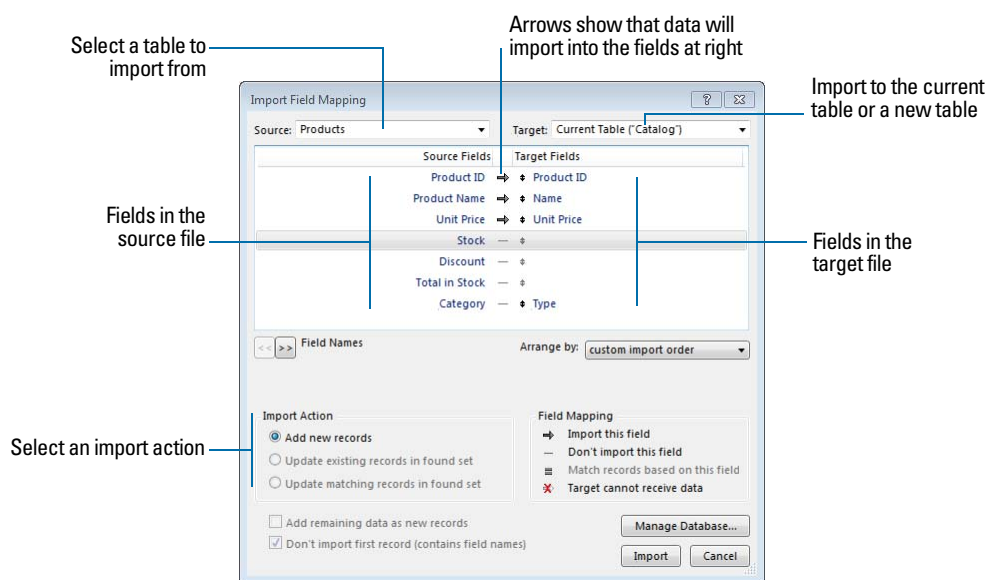
10. Click **Import**.

11. If the Import Options dialog box appears, choose one or more of the following options, then click **Import**.

You can:

- auto-enter data in fields defined with auto-enter options
- specify how to import data from repeating fields
- allow the target file to use existing external container field contents rather than import new container data

Converting a data file to a new FileMaker Pro file

You can convert a data file from another application into a new FileMaker Pro file. The converted file will contain:

- The data from the file or source you convert
- Two layouts for displaying the data

- Converted field names if they are available in the file or source you convert. Otherwise, field names are generic: f1, f2, f3, and so on.

- Converted field types if they are available in the file or source you convert. Otherwise, all fields are text fields.

To import data into a new file:

1. In the source application, save the data to import in a file type that FileMaker Pro supports. See "Supported import/export file formats" on page 103.

2. In FileMaker Pro, choose **File** menu > **Open**.

3. In the My Solutions tab in the Launch Center window, click **Browse**.

4. In the Open File dialog box, for **Files of type** (Windows) or **Show** (OS X), specify the type of file, choose the file to convert, then click **Open**.

5. If you see the First Row Option dialog box, choose whether the first row of data contains field names or the first record of data, then click **OK**.

6. If you're converting a Microsoft Excel spreadsheet and the Specify Excel Data dialog box appears, choose a worksheet or named range from the workbook file, then click **OK**.

7. In the New File dialog box, type a name for the new file, choose a location, then click **Save**.

FileMaker Pro converts the data to a FileMaker Pro file and displays the file.

About the exporting process

You can export FileMaker Pro data to a new file, then open it in another application.

The basic steps for exporting records are:

1. Open the FileMaker Pro file and display a layout that shows the records to export.

2. Find and sort the records to export. See "Finding records" on page 28 and "Sorting records" on page 32.

3. Choose **File** menu > **Export Records**.

4. In the Export Records to File dialog box, type a name and choose a location for the exported file, and choose a file type.

5. In the Specify Field Order for Export dialog box, select how to export the data.

To export	Choose
A field on the current layout	**Current Layout (LayoutName)** from the table list, then double-click a field in the list
A field in the current layout's table	**Current Table (TableName)** from the table list, then double-click a field in the list

6. If necessary, choose a character set for the exported file to use.

7. Select whether or not to apply the current layout's formatting to the exported data.

To export related fields, select the related table from the list

Select fields from this list

FileMaker Pro exports these fields

Select to apply formatting
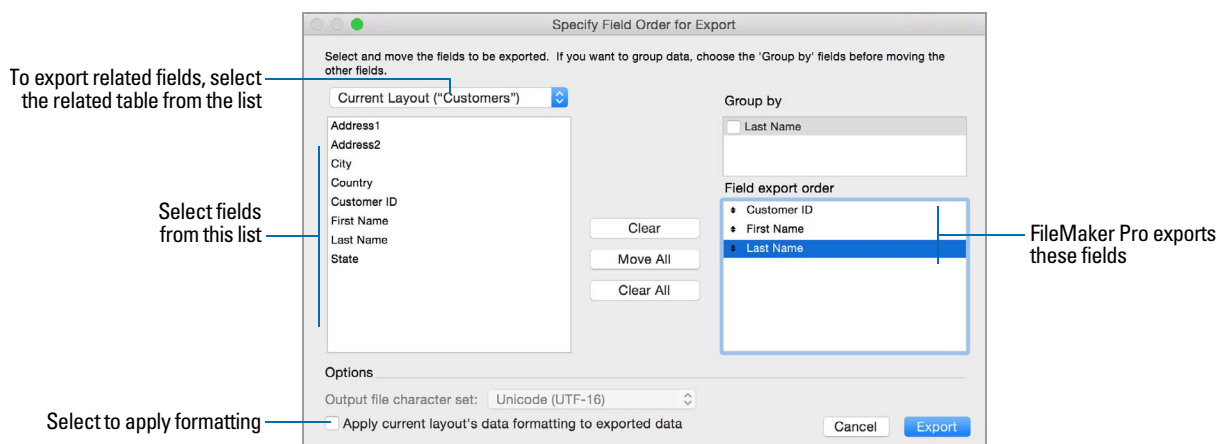
Working with external data sources

You can define data sources in a FileMaker Pro file to access data from:

- other FileMaker Pro files
- SQL databases that use ODBC technology for sharing information

When you define data sources in FileMaker Pro files, current data from external databases is displayed in your files. You can use FileMaker Pro to add, edit, delete, search, and sort data in the external files.

The following procedures provide an overview of how to access data in external FileMaker Pro files or external ODBC data sources.

Working with external FileMaker Pro files

To set up a file to access data from another FileMaker Pro file:

- Add tables from other FileMaker Pro data sources to the relationships graph in the current FileMaker Pro file.
- Add fields to layouts to display data from the other FileMaker Pro file.

Working with ODBC data sources

To set up a file to access data in supported ODBC data sources:

- Install and configure an ODBC driver for the external data sources you want to access.
- On the computer that hosts the current FileMaker Pro file, define a system Data Source Name (DSN) for each ODBC data source you want to access.
- Set options for the ODBC data sources you want to access (for example, whether users are prompted for a user name and password).
- Add one or more tables from the ODBC data source to the relationships graph in the current FileMaker Pro file.
- Add fields to layouts in the FileMaker Pro file to display external data.
- Optionally, add supplemental fields to external tables and layouts to display calculation and summary results based on data stored in external ODBC data sources.

Saving and sending data in other formats

You can save FileMaker Pro data as a Microsoft Excel worksheet or a PDF file, allowing you to give your record data to users who don't have FileMaker Pro.

FileMaker Pro lets you email the Excel worksheet or PDF file when you save it. You can also create scripts to save records as Excel or PDF.

In order to save files as Excel, you need the Allow Exporting Access privilege. To save files as PDF, you need the Allow Printing Access privilege.

Note   The saved file will only include fields that are on the layout when you perform the save. To include other fields (for example, fields on tab panels that are not in front), use the **Export Records** command instead of **Save/Send Records As**.

Sending email messages based on record data

You can use FileMaker Pro to send one message, or multiple messages, to one or more recipients. Generated email is sent using your default email application or directly through SMTP (Simple Mail Transfer Protocol, a set of criteria for sending and receiving email). You can enter values, or use values from fields or calculations. You can also create scripts to send email.

Publishing solutions on the web

If you have FileMaker Server, you can use FileMaker WebDirect to quickly and easily publish layouts from your solutions on the web. You don't need to install additional software—anyone with compatible web browser software and access to the Internet or an intranet can connect to your FileMaker WebDirect solution to view, edit, sort, or search records, if you give them access privileges. With FileMaker WebDirect, data in the web browser updates automatically as FileMaker Server pushes data to the web browser.

For more information, see *FileMaker WebDirect Guide*.

Chapter 6
Protecting files

This chapter describes the basics of how to restrict what users can see and do in a FileMaker Pro file. You'll learn about:

- planning security for a file
- viewing and creating user accounts and passwords
- viewing and creating privilege sets
- viewing extended privileges
- authorizing other files to access your files
- taking measures to secure your database solution, and your operating system, network, and hardware
- backing up databases and other files
- installing, running, and upgrading antivirus software

Note   See Help for detailed, comprehensive information and step-by-step procedures about using FileMaker Pro.

For comprehensive information about securing FileMaker Pro files, see
http://www.filemaker.com/support/security.

Protecting databases with accounts and privilege sets

You can limit what users can see and do in a database file. You can restrict:

- **Data access:** Make particular records or fields from individual tables view-only, or hide them completely.
- **Layout access:** Prevent users from modifying layouts in Layout mode.
- **Access to value lists and scripts:** Prevent users from accessing and modifying value lists and scripts, and from running scripts.
- **Access to file sharing:** Individually enable file sharing via the FileMaker Network, ODBC and JDBC, and FileMaker WebDirect.
- **Outputting data:** Prevent users from printing or exporting data.
- **Menu access:** Make only a limited set of menu commands available.

You restrict what users do in a file by requiring them to enter an account name and password when they attempt to open a file. The account name they enter determines which privilege set will be used and the privilege set limits what they can do in a file. For more information about accounts and privilege sets, see the following section.

You can define privileges in a shared file while clients are using it. Any privilege changes that affect a current client do not take effect until the client closes and reopens the file.

The privileges that you set up apply to a single file only and all database tables within that file. If your database solution consists of multiple files that you want to protect, you may want to combine all of these files into one multi-table file. Then you can define privileges in only a single file to manage access to the entire database solution. If you don't want to combine the files into one file, then you should define privileges in each file that contains items to protect.

Important If you create a relationship in one file that references a table in another file, you cannot manage access privileges for the related table in the first file. The privileges defined in the other file control access to that table.

Accounts, privilege sets, and extended privileges

Accounts

Accounts authenticate users who are attempting to open a protected file. Each account specifies an account name and usually a password. Any user who cannot specify valid account information won't be able to open a protected file.

Each database file contains two predefined accounts: Admin and Guest. For more information, see "About the predefined accounts" on page 112.

You may want to create an account for every individual who accesses a file, or you may want to create a small number of accounts that are shared among many individuals, such as a "Marketing" account and a "Sales" account.

- Create accounts for individuals when it is necessary to verify the identities of particular users and you want to manage access at an individual level.

- Create shared accounts when you want fewer accounts to maintain and you are less concerned about managing individual access to the file.

If you host files on FileMaker Server, you can create External Server accounts that obtain authentication information from an authentication server such as an Apple Open Directory or a Windows domain. For more information, see "Creating accounts that authenticate via an external server" on page 118.

Privilege sets

A *privilege set* specifies a level of access to a database file. Each database file contains three predefined privilege sets for common types of access levels: Full Access, Data Entry Only, and Read-Only Access. When you create a privilege set, there are many options available that you can use to limit database access, such as which layouts are viewable, which menus are available, and whether printing is permitted. Privilege sets can also restrict access to records or fields from particular tables within a file. Each account is assigned a privilege set, which determines the level of access when someone opens a file using that account.

You can create as many privilege sets as you need to define the types of access you want to permit to a file. For more information about privilege sets, see "About the predefined privilege sets" on page 113.

Extended privileges

Extended privileges determine the data sharing options that are permitted by a privilege set, such as whether a privilege set permits users to open a shared file or view a database in a web browser.

The following table lists the default extended privileges that are available. (FileMaker and third-party developers may define additional extended privileges to manage access for other software products designed to work with FileMaker Pro or FileMaker Server.)

Keyword	Extended privilege	Determines if a privilege permits
fmwebdirect	Access via FileMaker WebDirect	Accessing a database file from a web browser via FileMaker WebDirect.
fmxdbc	Access via ODBC/JDBC	Accessing a database as an ODBC or JDBC data source.
fmapp	Access via FileMaker Network, server-side scripting, or FileMaker Go	Opening a shared file (either a file shared by FileMaker Pro or hosted and shared by FileMaker Server).
fmreauthenticate10	Require re-authentication after the specified minutes in sleep/background	Accessing a file in FileMaker Pro or FileMaker Go without having to re-login after file hibernation or after using a different app. The default time is 10 minutes.
fmxml	Access via XML Web Publishing - FMS only	Accessing a database file from a web browser or other application via XML web publishing (FileMaker Server only).
fmphp	Access via PHP Web Publishing - FMS only	Accessing a database file from a web browser or other application via PHP web publishing (FileMaker Server only).

When a user attempts to open or access a protected file using one of the above methods, he or she will be prompted to provide account information. If the privilege set for the account does not permit the type of extended privilege access the user is requesting, the user will get an error indicating that he or she cannot access the file.

All extended privileges except fmreauthenticate10 are disabled by default, even in the Full Access privilege set.

Enabling extended privileges only makes it allowable for certain privilege sets to access shared data. To actually access the shared data, you must also set up sharing for the type of access that you want. For more information on extended privileges, see "Viewing extended privileges" on page 120.

About the predefined accounts

Each database file contains two predefined accounts: Admin and Guest.

Admin account

The Admin account is assigned the Full Access privilege set, which permits access to everything in a file. The Admin account is not assigned a password. In files for which privileges are not set up, the file options are set up to automatically log in to the file using the Admin account.

The Admin account is fully editable. You can rename it, assign it a password, or make the account inactive. You can even delete the Admin account; however, you must assign the Full Access privilege set to at least one other active account.

Important   Don't forget the account name and password that is assigned to the Full Access privilege set. If necessary, write it down and store it in a secure place. If you lose or forget this account name and password, you may not be able to access the file.

Guest account

The Guest account permits users to open a file without specifying any account information. The Guest account is not assigned a password. By default, the Guest account is assigned the Read-Only Access privilege set, but you can assign any privilege set to the Guest account.

Initially, the Guest account is inactive, which disables the guest option in the Open *<filename>* dialog box and prohibits users from opening files as a guest. You can enable the Guest account to permit guest access.

The Guest account is not fully editable. You cannot delete the Guest account, change the Guest account name, or assign it a password.

About the predefined privilege sets

Every new database file contains three predefined privilege sets.

- Full Access: permits accessing and changing everything in the file
- Data Entry Only: permits viewing and entering of data only
- Read-Only Access: permits viewing but not changing data

Note   The Read-Only Access privilege set permits write access to all global fields. To create a privilege set in which global fields and all record data are view-only, you can duplicate the Read-Only Access privilege set and change **Records** from **Custom privileges** to **View only in all tables**.

You cannot change or delete these predefined privilege sets, except to enable or disable extended privileges for them. You can either use them as is, or duplicate them and then modify the duplicate copies.

The following table summarizes the properties of these privilege sets.

Privilege	Full Access privilege set	Data Entry Only privilege set	Read-Only Access privilege set
Records (in all tables)	create, edit, delete	create, edit, delete	view only
Layouts	all modifiable	view only	view only
Value lists	all modifiable	view only	view only
Scripts	all modifiable and executable	all executable only	all executable only
Extended Privileges	all off, except fmreauthenticate10	all off, except fmreauthenticate10	all off, except fmreauthenticate10
Allow printing	on	on	on
Allow exporting	on	on	on
Manage extended privileges	on	off	off
Override data validation warnings	on	off	off
Disconnect user from FileMaker Server when idle	off	on	on
Allow password modification	on	on	on
Password change number of days	off	off	off
Minimum password length	off	off	off
Available menu commands	All	All	All

You must have Allow Printing privileges to save records as a PDF file. You must have Allow Exporting privileges to export records as a Microsoft Excel worksheet. See "Saving and sending data in other formats" on page 109.

Note   The Full Access privilege set is the only one that permits access to the Manage Database and Manage External Data Sources dialog boxes in order to modify fields, tables, relationships, and data sources. It is also the only privilege set that permits changing accounts and privileges. Because you cannot enable these privileges in any other privilege set, any user who wants to make database definition changes or privileges changes must open the file with an account that is assigned the Full Access privilege set.

At least one active, FileMaker authenticated account in each file must be assigned the Full Access privilege set.

Planning security for a file

A new FileMaker Pro file is initially unprotected. Whenever the file opens, it automatically logs in the user with the Admin account, which is assigned the Full Access privilege set.

- If you simply want to keep someone else from opening a database file on your computer, you can password-protect the file. For more information, see "Password-protecting a file" on page 116.

■ If you need to share a database file with others and provide varying levels of file access to different users, you need to plan the security for the file. Consider listing the types of users and their privileges:

	Managers	Marketing	Sales	HR	Legal	Guests
View records	Yes	Yes	Yes	Yes	Yes	Yes
Create records	Yes	Yes	Yes	Yes	No	No
Edit records	Yes	Yes	Yes	Yes	No	No
Delete records	Yes	Limited*	Limited*	Yes	No	No
Modify scripts	Yes	Limited*	No	Yes	No	No
Execute scripts	Yes	Yes	Yes	Yes	Yes	No
Modify value lists	Yes	No	No	No	No	No
Menus	All	Editing only	Editing only	All	Minimum	Minimum

* You can provide limited access to some features, for example deleting records, by using record-by-record privileges.

You can additionally protect a file by requiring authorization of any file that attempts to access its tables, layouts, value lists, and scripts. See "Authorizing access to files" on page 120.

To plan the security for a shared file:

1. Determine the privilege sets that you need for the file.

Make a list of the areas of the file to protect, such as particular tables, fields, records, layouts, value lists, and scripts. Plan the number of privilege sets you need to enforce the varying levels of file access that you require.

2. Determine whether you need individual accounts for each user, or group accounts that multiple users can share.

3. Decide if you want to enable the Guest account, which permits users to open the file without specifying account information.

4. Create the privilege sets that you need in the file.

5. Determine if you need to enable any extended privileges for specific privilege sets.

Don't enable extended privileges unless they're needed.

6. Create the accounts you need in the file, and assign the appropriate privilege set to each account.

For information, see the next section. If you're using the Guest account, assign a privilege set to it. Otherwise, disable the Guest account.

7. Open the file using different accounts and test each privilege set that you created. Make sure the restrictions work the way you want, and make any needed corrections to your privilege sets.

8. Optionally, limit other files from accessing the solution's schema. For more information, see "Authorizing access to files" on page 120.

Password-protecting a file

After password-protecting a file, you will be prompted to enter an account name and password every time you open the file. Anyone who does not know this account information will not be able to open the file.

To password-protect a file:

1. Make the following changes to the accounts in the file:

- Edit the Admin account so that it has a different account name, a password, and uses the Full Access privilege set.

- Make sure the Guest account is inactive.

- Delete any other accounts in the file or make them inactive.

2. If necessary, edit the Full Access privilege set to allow yourself any extended privileges you may want for yourself.

Don't enable extended privileges unless they're needed.

Suggestions for creating secure passwords

- Secure passwords are typically eight or more characters in length, and include at least one numeric character.

- Passwords are case-sensitive. For example, if you specify a password as `zFootBallz2`, FileMaker Pro will not accept `zfootballz2`. When you're entering a password for an account, make sure the Caps Lock key on your keyboard is not inadvertently enabled.

- If the file is shared via web publishing, account names and passwords can only use characters included in the ISO Latin-1 character set (except colons). To avoid characters that may be interpreted incorrectly over the web, limit account names and passwords to alphabetic and numeric characters only.

Creating accounts and privilege sets

Accounts specify account names and (usually) passwords for a file. When a user opens a file that contains accounts, a dialog box prompts the user to enter account information. When a user opens a file with a correct account name and password, the privilege set assigned to that account determines what the user can do in that file.

Privilege sets specify levels of access to a database, such as which layouts are viewable, which menus are available, and whether printing is permitted.

To create and manage accounts and privilege sets for a file, you need to open the file with an account that is assigned the Full Access privilege set. In addition, to make changes to an account that's assigned the Full Access privilege set (for example, deleting the account or assigning Full Access privileges to it), you need to use a local account that's assigned Full Access privileges.

You can create and modify accounts and privilege sets in a shared file while clients are using it. The account changes you make take effect immediately. However, the changes do not disrupt any current clients. For example, if you change the password for an account that is in use by one or more clients, their FileMaker Pro usage is not interrupted. However, they will need to enter the new password the next time they open the file.

You can create as many accounts as you need. You can create individual accounts for each user, or a smaller number of accounts that users can share.

Viewing accounts

1. With the file open, choose **File** menu > **Manage** > **Security**.

The Manage Security dialog box appears. If the detailed security settings are displayed, click **Use Basic Setup**.

2. You see the accounts defined for this file on the left.

Accounts defined for the file
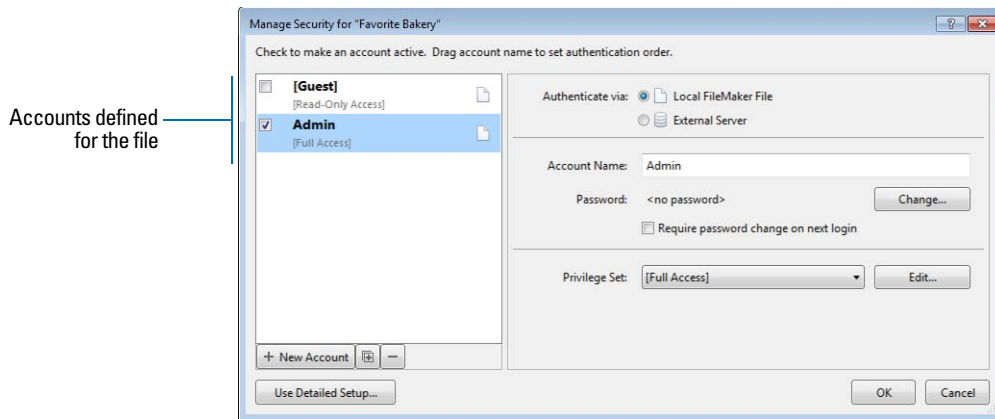
3. Click **OK**.

Creating and editing accounts

You can create accounts for every individual who accesses a file, or create fewer accounts that are shared among many individuals, such as a "Marketing" account and a "Sales" account. You must assign a privilege set to each new account.

To create or edit an account:

1. With the file open, choose **File** menu > **Manage** > **Security**.

2. If the Manage Security dialog box displays the detailed settings, click **Use Basic Setup**.

Select to make the account active

Add, duplicate, or delete an account

Choose how to authenticate the account

Enter account and password information

Change privileges for the account
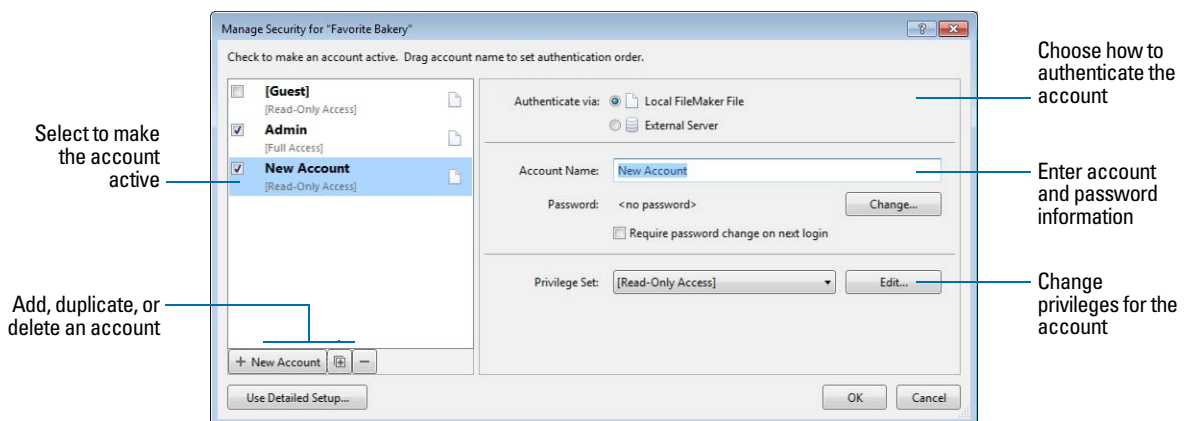
3. To create a new account, click **New Account**. To change an existing account, select the account.

4. For **Authenticate via**, choose **Local FileMaker File**.

To authenticate the account via an external server, choose **External Server**.

5. For **Account Name**, enter or change the account name.

Account names are not case-sensitive.

6. To define or change the password, for **Password**, click **Change**. Then, enter and confirm the new password, and click **Set Password**.

7. To force the account user to create a new password during the next login, select **Require password change on next login**.

8. For **Privilege Set**, do one of the following:

- Choose a privilege set.
- Choose **New Privilege Set**, then create a new one.
- Chose a privilege set, then click **Edit** and change the privilege set.

9. To make the account active, select its checkbox.

To make an account inactive (for example, until you set up its privilege set), clear the checkbox.

10. Click **OK**.

To duplicate or delete an existing account:

1. Follow steps 1 and 2 in "Creating and editing accounts," above.

2. In the Manage Security dialog box, select an account, then:

- To duplicate the account, click ⊞ .
- To delete the account, click — .

3. Click **OK**.

Creating accounts that authenticate via an external server

If you're hosting FileMaker Pro database files with FileMaker Server and your organization uses centrally managed authentication for users and groups such as Apple Open Directory or a Windows domain, you can set up accounts that authenticate users based on your authentication server. This allows you to use your existing authentication server to control access to databases without having to manage an independent list of accounts in each FileMaker Pro database file.

Note   Only database files hosted by FileMaker Server can authenticate users against an authentication server. Database files shared by FileMaker Pro won't authenticate against an authentication server.

Important   When a database file contains one or more External Server accounts, make sure you use operating system security settings to limit direct access to the file. Otherwise, it might be possible for an unauthorized user to move the file to another system that replicates your authentication server environment and gain access to the file. For more information, see FileMaker Server Help.

Creating and editing privilege sets

You can assign each privilege set to one or more accounts.

To create a privilege set:

1. With the file open, choose **File** menu > **Manage** > **Security**.

If the Manage Security dialog box displays the basic security settings, click **Use Detailed Setup**.

2. Click the **Privilege Sets** tab.

By default, each privilege set option is set to its most restrictive setting.

Click to create a new privilege set
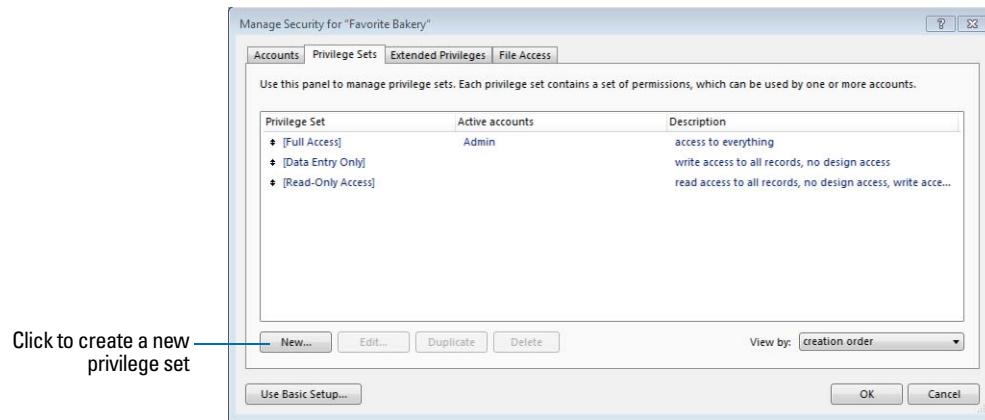
3. To create a new privilege set, click **New**. To edit an existing privilege set, select the privilege set to edit, then click **Edit**.

4. Enter or change the name and optional description for the privilege set.

5. Define the privileges for the privilege set.

Privilege sets that you can't change are dimmed.

6. Click **OK**.

After you create the privilege sets, create or edit accounts so that they use the appropriate privilege sets. See "Creating and editing accounts" on page 117.

About enabling record-level access

You can set individual record access for each table. For example, the privilege set can limit the ability to:

- View, edit, create, or delete all or certain records within each table.
- Access or modify certain fields within each table.

You can only set record access privileges for tables defined in the current file. If the file contains relationships to tables in other files that you want to protect, you need to create accounts and privilege sets in the other files to protect those tables.

Viewing extended privileges

Extended privileges determine the data sharing options that are permitted by a privilege set for a file. For example, if the file is shared, the Access via FileMaker Network extended privilege determines if the privilege set allows opening the shared file as a client. The Access via FileMaker WebDirect extended privilege determines whether the privilege set allows accessing the database from a web browser.

There are six default extended privileges. For more information about them, see "Accounts, privilege sets, and extended privileges" on page 111.

You can view extended privileges in the Manage Security dialog box, as well as enable each extended privilege for selected privilege sets. All extended privileges except fmreauthenticate10 are disabled by default, even in the Full Access privilege set.

It may be necessary to delete an extended privilege that is no longer required.

To view the extended privileges:

1. With the file open, choose **File** menu > **Manage** > **Security**.

   If the Manage Security dialog box displays the basic security settings, click **Use Detailed Setup**.

2. In the Manage Security dialog box, click the **Extended Privileges** tab.

Authorizing access to files

As part of your overall security plan, you can control whether other FileMaker Pro files are permitted to access the schema in a file (including its tables, layouts, scripts, and value lists) in your secured solution. When protection is enabled, any use of the protected file through a FileMaker data source will require authorization. Therefore, in a multi-file solution, you will need to authorize the other files.

For example, enabling protection prevents someone with an account in your file from creating another file that uses tables in your file but does not implement the same business logic (such as the same script triggers). The use of this alternative file can bypass your intended business logic (although record-level access would still be enforced). Turning on this option also prevents files that are not authorized from opening a protected file using the Open File script step.

Note   You must have the Full Access privilege set for any file that you want to protect and any file that you want to authorize.

To authorize access to a file:

1. With the file open, choose **File** menu > **Manage** > **Security.**

   If the Manage Security dialog box displays the basic security settings, click **Use Detailed Setup**.

2. Click the **File Access** tab.

3. To protect this file against unwanted access from other files, select **Require full access privileges to create references to this file**.

4. If any files that reference the protected file are currently open. When you see an alert, click **Yes**.

5. To authorize additional files that are not currently open, click **Authorize**. In the Open File dialog box, choose a local or remote file to authorize, and click **Open**.

   You may be asked to enter the name and password of an account with Full Access privileges.

6. Click **OK**.

Security measures

Be sure that your database files, host computers, workstations, and the networks that access them are safe from theft and corruption. To protect your data and equipment, you should implement the following five important security measures:

- Enhance physical security
- Enhance operating system security
- Establish network security
- Back up databases and other important files
- Install, run, and upgrade antivirus software

Enhancing physical security

Evaluate your computers to make sure they are physically secure:

- The host computer should be a dedicated machine, anchored to a desk or immovable object with a lock. Secure the computer so that its hard drive cannot be removed. Restrict access to the computer by storing it in a locked room.
- Secure the client workstations that access a database. Lock the computers down and restrict access by using a screensaver that requires a password.
- Protect the physical security of the computers, hard drives, and backup storage media where the files reside.

Enhancing operating system security

Use the security features of your operating system to restrict access to important data. The network administrator should provide access only to individuals authorized to administer and maintain the system or the FileMaker files. In addition, they should:

- Track system user IDs and passwords.
- Restrict access to the FileMaker Pro application and file directories, servers, and web pages.
- Review remote access settings for file sharing and FTP.
- Restrict file upload or download access.
- Make sure all users have the latest, most secure versions of operating system software.
- To streamline processes, you can enable external authentication, which uses accounts that have been configured in the Windows Domain Authentication or in Apple Open Directory.
- Do not put FileMaker Pro files on file servers to share them. Use the built-in networking feature in FileMaker Pro and FileMaker Server. This prevents the files from being inappropriately copied or from introducing record locking and potential corruption issues when files are shared with inappropriate methods.

Establishing network security

Databases shared on an intranet or the Internet use the TCP/IP protocol. You may also use the TCP/IP protocol when you share databases peer-to-peer, or with FileMaker Server. Though TCP/IP is good for moving data and allowing clients to connect to your data, it was not designed with security as a primary objective. Unless you take precautions, it can provide uninvited access to your host computer, server software, databases, and perhaps to other client machines on your internal network. TCP/IP doesn't provide very much protection for data, so it is important to place barricades such as firewalls and SSL data encryption in the path of uninvited visitors.

- The most common barricade method used is the firewall, which separates your network into two distinct environments: a public environment that is "outside the firewall," and a private environment that is "behind the firewall." Users outside of the firewall will only have access to those TCP/IP or hardware addresses that you expose. You can concentrate your security on those server machines that are exposed, while allowing machines behind the firewall to operate with fewer safeguards.

- Using wireless networking devices, like the Apple AirPort Extreme and other 802.11n networking cards and base stations, can pose security challenges. These devices can broadcast your network traffic beyond the walls of your building, so it is extremely important to encrypt your wireless networking signals. Always use the maximum level of signal encryption available.

Backing up databases and other important files

Develop plans for restoring data, including alternate sites and systems to run business-critical information services. A current backup can help you recover from a situation where someone loses the administrator account information for a file, or from a situation where user error (and sometimes bad database design) causes data to be deleted or modified inappropriately.

Keep the following points in mind:

- Host databases with FileMaker Server and create regularly-scheduled, automated backups.

  Don't use third-party backup software on hosted FileMaker Pro databases. First, use FileMaker Server to make a backup copy of your database, then run your third-party backup software on the copy. Backup software can damage open, hosted databases.

  For example, make local backups of files at 6:00 am, 9:00 am, 12:00 noon, 3:00 pm, 6:00 pm, and 11:30 pm weekdays. At midnight, make an incremental backup of the entire system to the enterprise backup system. Finally, Friday night at midnight, perform a full system backup. Copy and store the backup tapes at a remote location. This way, if the server goes down for some reason other than catastrophic failure of multiple drives, the more recent backup of the data files can be used, meaning a maximum of 3 hours of lost data. If there is a catastrophic drive failure, then the previous evening's tape can be used, minimizing the loss to one day's data. Of course, these procedures can be tailored to your situation and data value.

- Make sure backup copies aren't damaged or inaccessible. Verify that they are functioning properly *before* you need them. Run diagnostic tools on your hard drive and your backup files regularly.

- Ensure that you can restore an entire set of files from backup copies.

- Regularly export the data to protect against file corruption.

- Protect the backup media itself. Store backups in a separate and fire-proof location.

- Assign backup administrators who can retrieve files, in case the network administrator is unavailable.

- Plan for redundancy. If the power goes off, a universal power supply (UPS) should sustain power for at least 15 minutes, enabling you to safely close all files. If the power can't be restored in a timely fashion, consider using a generator to supply power to servers. Also consider power sources for routers and firewalls. Will communication be a problem if your Internet access is interrupted for 48 hours or longer?

- Consider how you will continue to provide services if an intruder takes down your database server and that server can't be restored to its previous condition.

- Evaluate additional scenarios that could occur, and create a plan to respond to each one.

Also, network administrators should assess risks to data systems and business-critical functions. For example, consider:

- Theft of data or theft of proprietary intellectual property.

- Disruption, theft, or damage to network infrastructure such as servers, networks, data storage, or data backup storage. Damage can be caused by password crackers or by other types of malicious sabotage and destruction. Most incidents originate from within the organization.

- Disruption or damage to the organization infrastructure such as building fires, environmental or biological hazards, floods, and so on.

- Disruption or damage to the public infrastructure, including electrical power, telecommunications (voice and data), transportation grids (roadways, buses, trains) caused by environmental conditions, or severe weather such as tornadoes or floods.

FileMaker Pro provides two mechanisms for handling databases that might be damaged: consistency checks and file recovery. Consistency checks occur automatically, if needed, when the file is opened. You can also choose to verify the consistency of a file that you suspect is damaged. You can also have FileMaker Pro attempt to recover a damaged file.

Important   In the event of a server failure, such as an unexpected loss of power, hard drive failure, or software failure, use the backup files. Any system failure causing FileMaker Server to shut down inappropriately can result in corrupted files if cached data was not written to disk and the files were not closed properly. Even if the files reopen and go through a consistency check or recovery (initiated by either FileMaker Pro or you), corruption might be buried in the file. File recovery cannot guarantee that problems have been fixed.

Installing, running, and upgrading antivirus software

Because most computers have Internet access, they are vulnerable to harm, such as from viruses being transmitted through email attachments. Make sure all employees run antivirus checking software regularly, and that they are aware of typical virus warning signs. Employees should scan all files before copying or downloading them to their computers, and they should never open unsolicited attachments, even if they're from someone they know.

While antivirus software is essential in protecting your systems and data, some caution should be observed in how they are used on computers that host FileMaker Pro databases.

Antivirus programs sometimes lock bytes within a file when they scan for viruses. These locks can cause the operating system to return an error when FileMaker Pro or FileMaker Server try to write data to the file, which sometimes causes the file to be flagged as damaged and closed.

This situation also applies to files that FileMaker Server uses as backup targets. If the backup file is being scanned by antivirus software when a scheduled backup occurs, the destination file might be locked. This causes the backup process to fail, which may result in data loss. This same data loss issue applies when an open, non-shared FileMaker Pro database file is scanned by antivirus software.

When running antivirus software on computers that host FileMaker Pro databases, follow these recommendations:

- Do not run virus protection software on open or hosted databases. First, close the databases, then run the virus protection software.

- When you scan your computer for viruses, do not scan the Databases folder and subfolders or any folder that contains files that actively hosts files through FileMaker Server or FileMaker Pro. Instead, set your antivirus software to scan your database backup destination folder and make sure your antivirus scan schedule does not coincide with your FileMaker Server backup schedule. Wait until databases are completely backed up before scanning them.

Chapter 7
Using FileMaker Pro Advanced

FileMaker® Pro Advanced includes advanced development and customization tools designed especially for solution developers. You can use either FileMaker Pro or FileMaker Pro Advanced to create and test your solutions.

FileMaker Pro Advanced features

In addition to all the features that are available with FileMaker Pro, FileMaker Pro Advanced includes:

- Developer Utilities—for creating, customizing, and deploying runtime solutions
- Custom Functions—for creating custom functions for use anywhere within the solution
- Custom Menus—for creating customized menus for the solution
- Script Debugger—for systematic testing and debugging of FileMaker scripts
- Data Viewer—for monitoring fields, variables, and calculations
- Database Design Report—for publishing detailed documentation on structures or schemas of databases

See Help for detailed, comprehensive information and step-by-step procedures about using FileMaker Pro Advanced.

Developer Utilities

The Developer Utilities let you:

- produce a stand-alone runtime solution that users can access without running FileMaker Pro or FileMaker Pro Advanced
- rename a set of files and automatically update the internal links to related files and scripts
- remove administrative access from all accounts and prevent users from modifying most design or structural elements of your files
- display your files in Kiosk mode
- add the FileMaker Pro filename extension to a set of non-runtime files
- create an error log for processing errors
- encrypt files to protect them from unauthorized access while they are being stored on disk

Runtime solutions

The Developer Utilities create a copy of your files, and bind the database file or files to a runtime application with a name that you specify.

To create a runtime solution:

1. Close the files you want to customize.

2. Choose **Tools** menu > **Developer Utilities**.

3. Click **Add** to locate the files you want to customize.

4. Choose a location for the runtime solution.

5. Select options for the runtime solution.

6. Click **Create**.

Binding the solution

To bind database files into a runtime database solution:

1. In the Specify Solution Options dialog box, select **Create Runtime Solution application(s)**.

2. Name your runtime solution.

3. Create a bindkey.

   The bindkey links the runtime application to the database files and ensures that the bound files will only open in the appropriate runtime application. The binding key is case-sensitive.

4. Add a company logo or other custom image to the closing splash screen.

5. Click **Create**.

See Help for information about the differences between the runtime application and FileMaker Pro.

Converting and upgrading previous solutions

If you have developed a FileMaker Pro runtime solution using the Solutions Development Kit (SDK) for FileMaker Pro 3.0 or earlier, the Binder utility in the FileMaker Pro 4.0 Developer Edition, or the Developer Tool in FileMaker Developer 5.x and 6.0, you can upgrade your solution and provide your users with the converted files. Files bound to a runtime application using the earlier tools must be rebound using the Developer Utilities.

After you have converted the files, you can upgrade them to take advantage of newer FileMaker Pro and FileMaker Pro Advanced features. If necessary, create scripts to import users' existing data from the old runtime solution into the new, upgraded solution. Use the Developer Utilities to bind the solution files into a new, upgraded runtime solution.

Distribute the new upgraded runtime solution and provide instructions for how users can upgrade their files by converting the old files in the new runtime application and importing their data.

Distributing runtime solutions

The final steps in developing your runtime solution are to bundle all the necessary files together, choose how you will distribute your solution—for example, on media or over a network—and provide your users with documentation for installing your solution. In addition, your documentation should include instructions for starting the runtime application and what to do if a file is damaged.

Organizing solution components

When you bind your files into a runtime solution, the Developer Utilities create a new solution folder and place the runtime application, the bound primary and auxiliary database files, and an Extensions folder inside it. For Windows runtime solutions, there are also required Dynamic Link Library (DLL) files.

Note   When you move multiple files into one folder to create a runtime solution, be aware that your internal links are affected. For this reason, every data source must include a path that is just the filename of the file being referenced. Although the runtime application will check other data sources, it will then be able to find the file in the same folder in which it resides. You can still keep any absolute or relative paths in the same data source reference in case the files are also used in FileMaker Pro or FileMaker Pro Advanced.

Windows solution folder	OS X solution folder
Runtime application	Runtime application package
Bound primary and auxiliary solution files	Bound primary and auxiliary solution files
DLLs generated during binding	Extensions
Extensions	Dictionaries
Dictionaries	
Language resource folders	
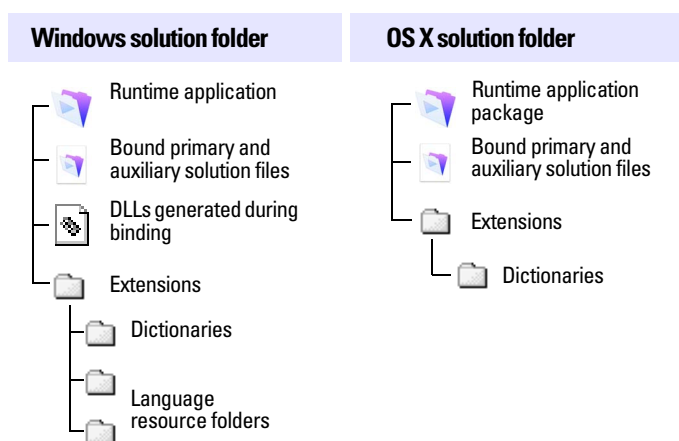
Example of Windows and OS X solution contents for distribution

Important   These files and folders must not be renamed.

If your runtime solution requires custom files, you should provide the files with the runtime files. The location of plug-in files depends on whether plug-ins need to be available to multiple versions of FileMaker Pro.

If a developer uses a font not found on a user's system, the runtime application will make a font substitution. If a font is included with the runtime, provision should be made for its installation through the installer program.

Testing before and after creating your solution

You should verify the functionality of your solution by testing it thoroughly before and after you customize it with the Developer Utilities.

To ensure the quality of your custom solution:

- Verify every function and option in your solution. If you're developing a solution for both platforms, test it in both Windows and OS X.
- Make sure your runtime solution does not use a standard FileMaker Pro feature that is hidden or disabled in the runtime application.

- Verify that all scripts and buttons work as expected. This is especially important if you're displaying your solution in Kiosk mode.
- Verify your installation procedures and test other instructions in the documentation.
- Verify that your layouts display well on monitors with different color capabilities and resolutions and on the smallest size monitor your users may be using.
- Test your runtime solution with actual data. This is especially important if users are upgrading from earlier versions of the runtime application and need to import data into new solution files.
- Make sure all the auxiliary files and DLLs (Windows) are present.
- Show your solution to intended users to uncover any usability issues.
- Install your bundled files on a completely different computer to verify that all the files associated with the primary file can be found.
- If you're assigning passwords or permanently removing full access privileges, test all access levels.
- Make sure your solution contains an About layout that notifies users of the level of access you're providing.

Important   You should keep an unbound version of any runtime solution files, especially if you've permanently removed full access privileges.

Distributing updates to runtime solutions

If you make feature enhancements or modifications to the primary bound file of your runtime solution, you can distribute the updated file to your users without rebinding it. If you change the filename of the primary file, however, you'll need to rebind the file and distribute a new version of the runtime application along with the updated file.

To distribute new or updated auxiliary files for your runtime solution, bind them first using the original binding key. If you are distributing a new auxiliary file that requires new data sources in the main file or that requires other files to interact with it, you must update all files that have been modified.

If you forget the original binding key for your runtime solution and want to update or add a file, you'll need to rebind all the files with a new binding key and redistribute the entire solution.

To distribute an updated primary file:

1. Open the original primary file from your copy of the runtime solution in FileMaker Pro Advanced.

2. Make the changes to the primary file.

3. If necessary, create an Import script so users can import their existing data into the new primary file.

4. Send your users a copy of the new primary file with instructions to replace the old primary file in the runtime solution folder.

To distribute a new or updated auxiliary file:

1. In FileMaker Pro Advanced, create the new auxiliary file or open the original auxiliary file (before it was bound), and make changes as required.

2. If necessary, create an Import script so users can import their existing data into the new file.

For more information about importing data into upgraded runtime solutions, see Help.

3. Use the Developer Utilities to rebind all the files in the runtime solution and include the new or updated auxiliary file.

Use the same binding key that you used for the primary file.

4. Send your users a copy of the new or updated auxiliary file along with instructions to place it in the runtime solution folder, replacing the old file if appropriate.

As long as the binding key has not changed, you don't need to redistribute the runtime application or other solution files.

Kiosk mode

Kiosk mode is a way of displaying your solution or runtime solution on a full screen, without any toolbars or menus. As the name suggests, Kiosk mode can be used to present your solution to users as an information kiosk. You can design your solution to run through a touch screen.

When you create a solution to run in Kiosk mode, you need to provide navigation for your solution and the ability for users to quit your solution.

Custom functions

Use the Custom Functions feature to create functions that can be reused anywhere in a file and copied or imported to other FileMaker Pro files. Once formulas are written for the function, they don't have to be rewritten to be applied to other fields or used in other scripts.

You can maintain and edit custom functions and the formulas they contain in one central location. Any change made to the custom function will be copied to all instances where that custom function has been used.

To create a custom function:

1. Choose **File** menu > **Manage** > **Custom Functions**.

2. Click **New**.
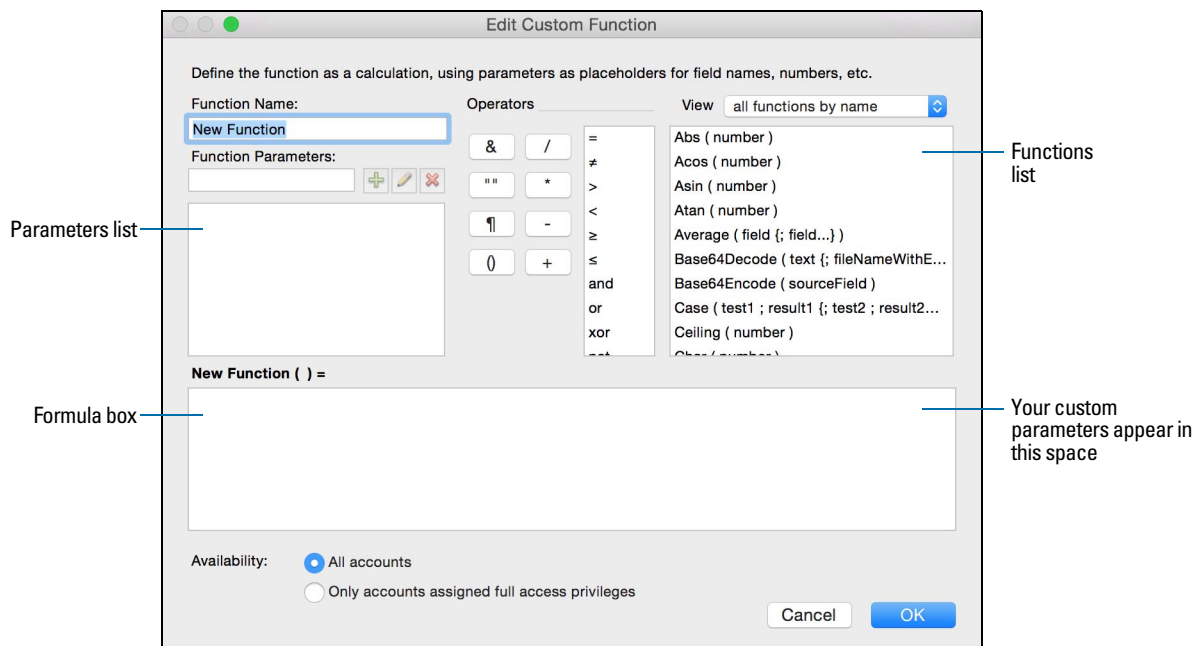
3. In the Edit Custom Function dialog box, type a name for the function and build a formula.

Custom menus, menu items, and menu sets

With FileMaker Pro Advanced, you can create custom menus, menu items, and menu sets for your solutions. You can:

- create a menu or edit an existing menu
- duplicate or delete a menu
- add, duplicate, or delete menu items
- specify menu item properties, such as display title, shortcut, and action

About custom menus

You can customize menus by:

- editing a copy of a standard FileMaker menu. Use this method to make minor changes to existing menus—for example, to modify the properties of a few menu items.

- starting with an empty menu. Use this method to make significant changes to menus—for example, to add menus and change menu item properties.
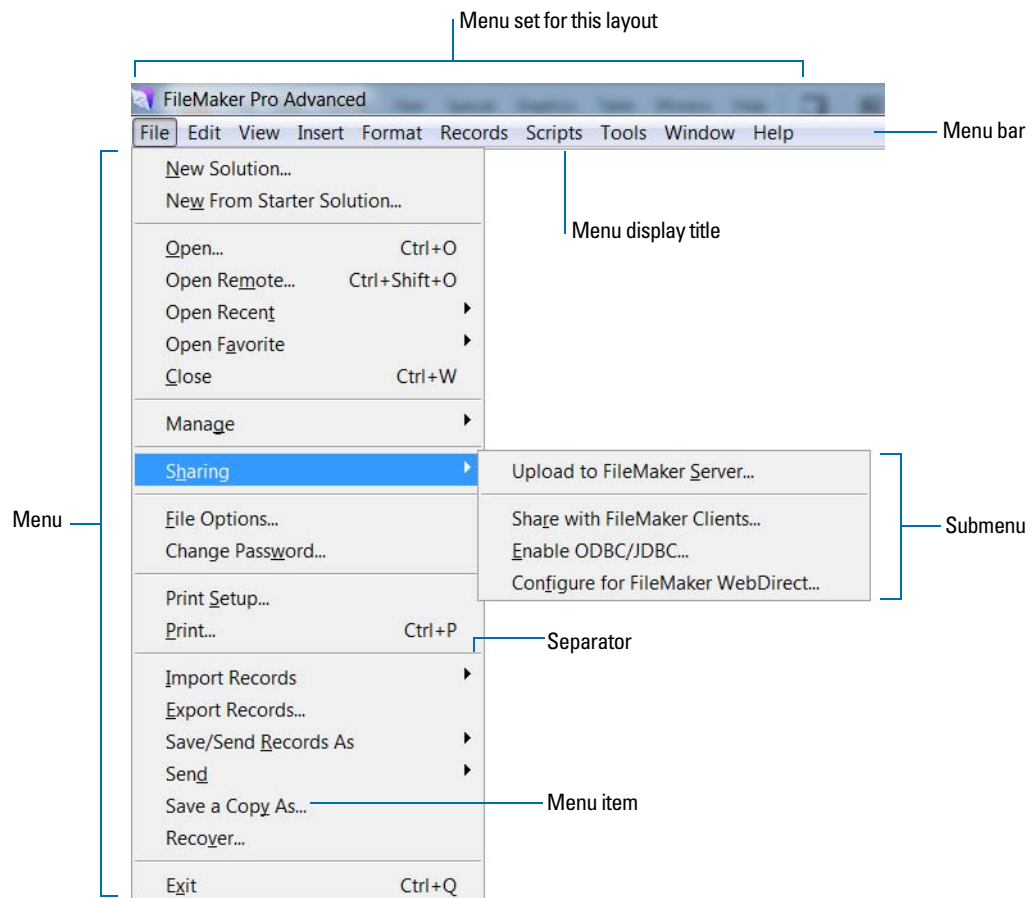
Custom menu terminology

About custom menu items

After you create a menu, you can create menu items. You can also create or edit menu items that are copies of the Standard FileMaker menus. Menu items can be commands, submenus, or separators. You can create a menu item that is based on a standard FileMaker command or you can create a menu item that initially does not have an assigned command.

When you base a menu item on a FileMaker command, the menu item inherits all the properties of that command. You can override properties (menu item name, keyboard shortcut, or action) to customize the menu item.

When you create a menu item that does not have an assigned command, an <unknown> menu item appears in the Menu Items list in the Edit Custom Menu dialog box. You can then customize this menu item's properties.

About custom menu sets

Custom menu sets are collections of menus that appear in the FileMaker Pro application menu bar. You can create custom menu sets to include only the menus you require. After you create menu sets, you can:

- specify menu sets for individual layouts
- create scripts that change menu sets
- change the default menu set in a solution file's menu bar
- switch menu sets temporarily using the FileMaker Pro Advanced Tools menu

Debugging scripts

Use the Script Debugger to systematically test and debug FileMaker scripts.

To run scripts in debug mode:

1. Select **Tools** menu > **Script Debugger**.

The Script Debugger opens.

2. Run your script.
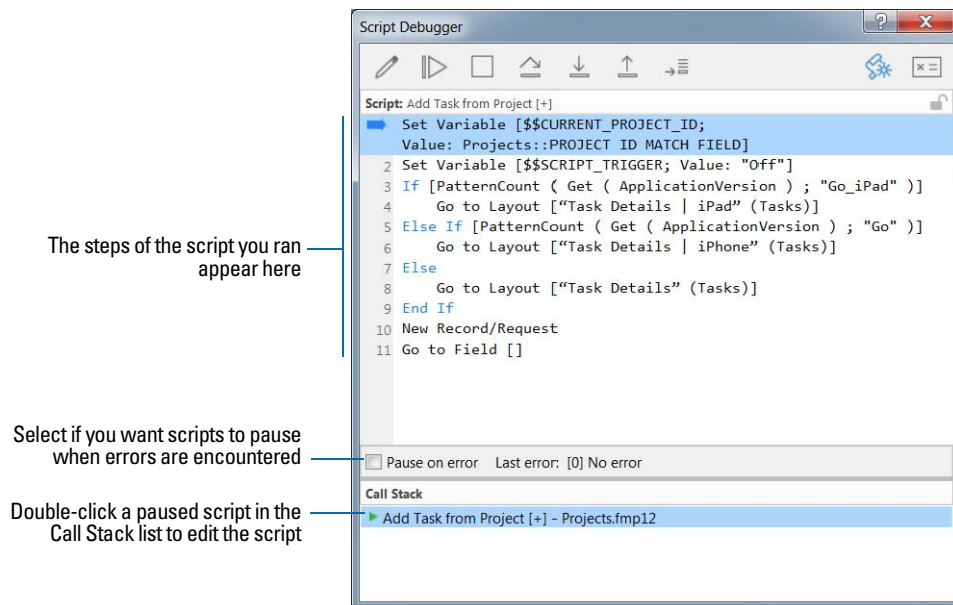
You can view sub-scripts when you step through scripts in the Script Debugger. For example, if Script A calls Script B, which then calls Script C, you can view the steps in all three scripts.

To set or clear a breakpoint, click the line number to the left of the script step. Breakpoints allow the Script Debugger to execute large sections of a script, pausing only to inspect the section marked with a breakpoint.

Monitoring expressions

Use the Data Viewer to monitor expressions like field values, local and global variables, and calculations. You can monitor these expressions while running scripts or while testing them in the Script Debugger.

To monitor the currently running script:

1. Choose **Tools** menu > **Data Viewer,** or click ⊠ in the Script Debugger.

2. Click the **Current** tab.
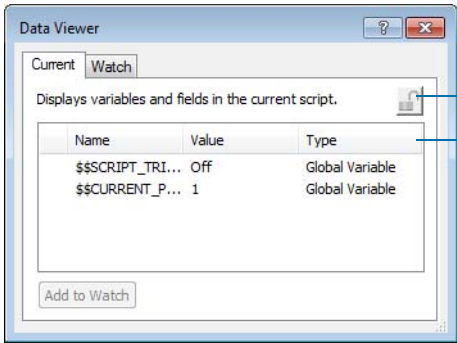
Click to view restricted-access expressions

Click a column heading to sort

To monitor expressions:

1. In the Data Viewer, click the **Watch** tab.
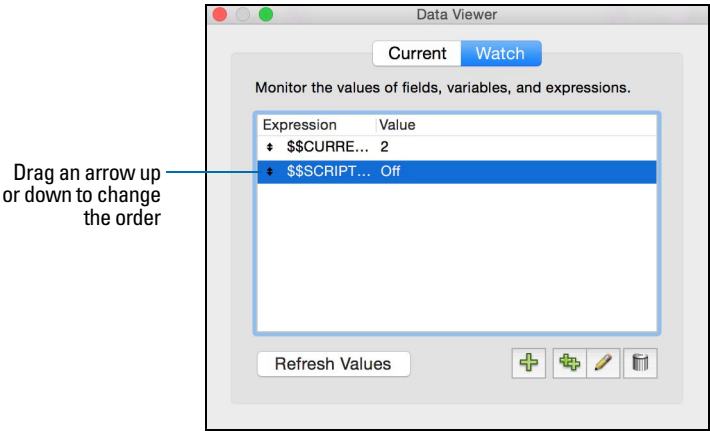
Drag an arrow up or down to change the order

2. Perform the following tasks:

- To add an expression, click ➕. In the Edit Expression dialog box, build an expression, then click **Monitor** to add the expression to the Data Viewer.
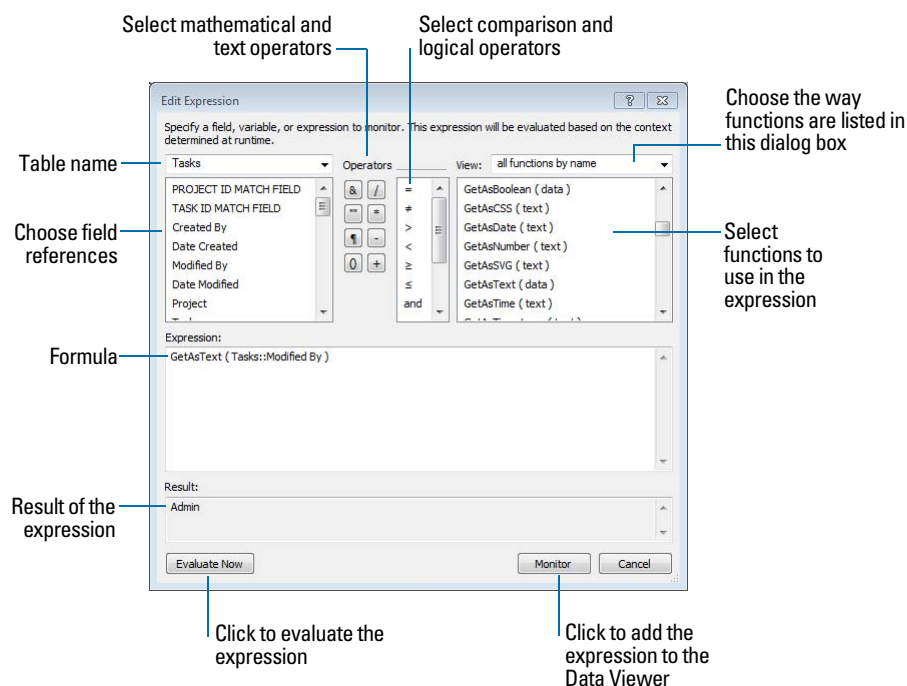
- To edit an expression, double-click the expression in the Watch tab or select an expression and click 🖊 . Define or edit the expression. Then, click **Evaluate Now** to display the result of the expression or click **Monitor** to add the expression to the Watch list.

Documenting database schemas

With the Database Design Report (DDR) feature you can:

- examine a textual representation of your database schema
- gather statistics on the structure of your database
- produce reports in HTML or XML for any databases that are currently open, either locally or on a network
- use the information in the report to re-create the structure of your database if you lose the original database files
- troubleshoot missing references, broken relationships, calculations, and more

To create a database design report:

1. Choose **Tools** menu > **Database Design Report**.

2. Set options for the report.

Select the files and tables to include

Select the elements to include

Choose the format of the published report

Choose whether to open the report when it's completed
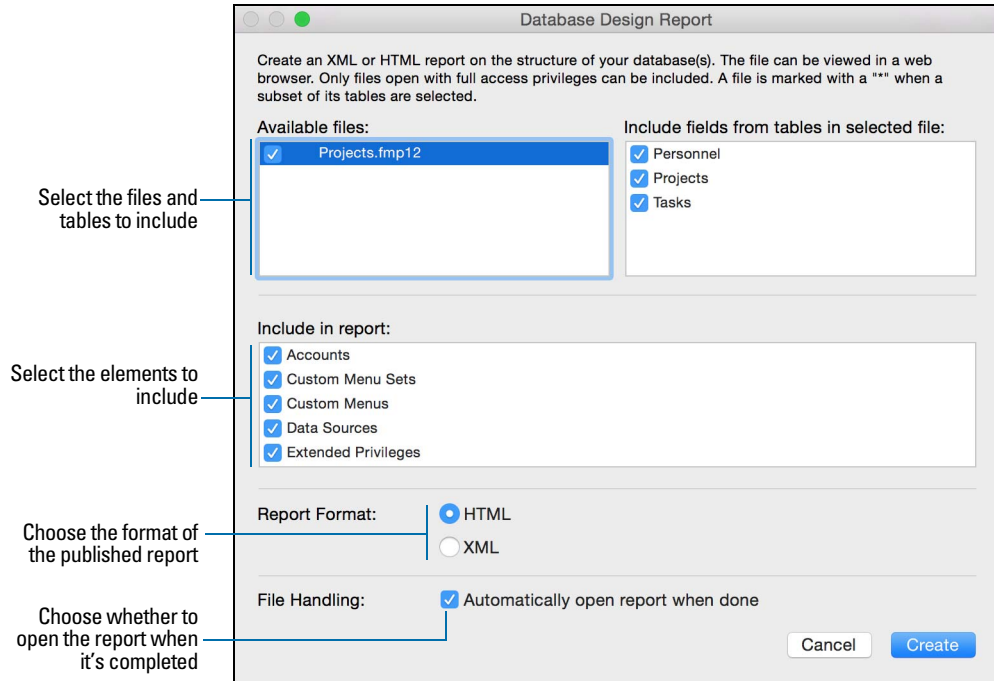
3. Click **Create**.

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