

*For FileMaker 13*

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# FileMaker Training Series

## Basics



FileMaker®

# FileMaker Training Series: Basics for FileMaker 13

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# FileMaker®

TRAINING SERIES

## Preface

### Master the essentials of FileMaker 13

Congratulations on selecting the FileMaker Training Series! The **FileMaker Training Series: Basics** and the **FileMaker Training Series: Advanced** make up the official curriculum for learning how to use FileMaker software to build professional solutions.

The **FileMaker Training Series: Basics** focuses on the features and benefits of the FileMaker Platform with special attention to the newest version, FileMaker 13. You will learn how to build a sample FileMaker solution from start to finish.

The **FileMaker Training Series: Advanced** is for intermediate to advanced FileMaker developers, but anyone who creates FileMaker databases can increase their knowledge from this series. It also serves as a stepping-stone to becoming a FileMaker 13 Certified Developer. **FileMaker Training Series: Advanced** is a separate purchase.

## Necessary materials

The **FileMaker Training Series: Basics** training has activities to guide you through the FileMaker Platform. In order to follow along, make sure you have the following materials.

## Software

Before you begin the training, you will need the following software:

FileMaker Pro 13 – download 30-day trial:

<http://www.filemaker.com/trial>

FileMaker Go 13 – free download from the App Store:

<http://www.filemaker.com/fmgo>

## Activity files

The activities in this training will use the following files:

- **Contacts.fmp12**
- **Customers.xlsx**
- **Assets.xlsx**

## Solution File

This is an example of the finished solution being built in this training:

- **Equipment Rentals.fmp12**

To download the activity and solution files, visit:

[http://www.filemaker.com/r/fts\\_basics\\_activities](http://www.filemaker.com/r/fts_basics_activities)

## Acknowledgment

Special credit to [Soliant Consulting, Inc.](#) for the development of this curriculum. A platinum member of the FileMaker Business Alliance, Soliant Consulting specializes in FileMaker Pro development, training, and consulting; the company has offices in Chicago, the San Francisco Bay Area, and Philadelphia.



<http://www.soliantconsulting.com>

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# Introduction

What if you could streamline your business by creating custom solutions that transform the way you and your team work? Instead of relying on spreadsheets, paper forms, or multiple applications to get your work done, connect your team together with interactive screens, reports, and dashboards that deliver all the information they need in one place. The FileMaker platform puts you in control, providing an easy way to create database solutions that meet the specific needs of your business.

FileMaker, Inc. is a subsidiary of Apple. Millions of people, from individuals to some of the world's largest companies, rely on the FileMaker Platform to manage, analyze and share important information. The software is available in over 60 countries in 17 languages and is used by several different types of organizations including government, education, healthcare, retail, manufacturing, real estate, legal and more.

The FileMaker Platform is a line of products that work together to streamline your business. You can easily create solutions to manage and share information with your team on iPad, iPhone, Windows, Mac and the web.

FileMaker databases are generally referred to as “solutions.” FileMaker solutions bring together many software elements to solve business problems. Solutions built with the award-winning FileMaker Platform are used to streamline a wide range of functions like project management, asset management, invoicing and billing, and customer relationship management (CRM).

The training available for the FileMaker Platform is:

- **Getting Started Tour** in FileMaker Pro and FileMaker Go take you through the key features so you can start to build and use a solution immediately.
- **FileMaker Training Series: Basics** builds on the **Getting Started Tour** and introduces how you can use the FileMaker Platform to create and deploy custom data management solutions.
- **FileMaker Training Series: Advanced** provides in-depth coverage of development practices and techniques for FileMaker developers.

The FileMaker Training Series: Basics focuses on the features and benefits of the FileMaker Platform with special attention to the newest version, FileMaker 13. For simplicity, "FileMaker" is used throughout the training except in cases where a feature is specific to FileMaker 13.

You will learn the capabilities of the key products for creating solutions, FileMaker Pro and FileMaker Pro Advanced. FileMaker Pro Advanced has all the features to create solutions that are included in FileMaker Pro plus a suite of advanced development and customization tools. But for simplicity, "FileMaker Pro" is used when referring to the software used to create solutions.

FileMaker Training Series: Basics assumes that you have FileMaker Pro installed on your Mac or Windows computer and FileMaker Go installed on your iOS device. Activities are included in the training that require you to use both products.

The FileMaker Training Series: Basics is organized as follows:

- In Lessons 1 - 2, you will be introduced to:
  - The FileMaker Platform
  - FileMaker Starter Solutions
- In Lessons 3 - 4, you will learn about using a FileMaker solution and how to:
  - Navigate a FileMaker solution
  - View and modify data in a solution
  - Find and sort data in a solution
- In Lesson 5, you will learn about user-centered design including:
  - Planning a solution to solve the right problems
  - A sample scenario used for the rest of the lessons
- In Lessons 6 - 8, you will learn about data and how to:
  - Import data into a FileMaker solution
  - Create tables, fields, and relationships for your data
- In Lessons 9 - 13, you will learn about user interface design and how to:
  - Use themes, styles, guides and other FileMaker design tools
  - Create interfaces for iOS devices
  - Create efficient interfaces for the user

- In Lessons 14 - 19, you will learn about powerful tools in the FileMaker Platform including:
  - Calculations, Scripting and Reporting
  - Integration with other business systems
  - Security
  - Sharing and deployment of your solution to other users

We appreciate your interest in learning how FileMaker can solve your business challenges. We support you in your training process and encourage you to visit the FileMaker Forum at <http://www.filemaker.com/forum> and post any questions you may have.

## Lesson 1

# FileMaker Platform Overview

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**Time:** This lesson takes approximately 20 minutes to complete.



# Objectives: FileMaker Platform

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**After this lesson, you will be able to:**

- Identify the four products of the FileMaker Platform
- Identify the requirements for building, accessing, and hosting FileMaker solutions
- Compare and contrast FileMaker Pro and FileMaker Go
- List the additional features in FileMaker Pro Advanced
- Describe real-world uses of FileMaker solutions

The FileMaker 13 Platform is a set of tools and technologies that enable you to create, deploy, and manage custom business solutions, as well as modify them as your needs change. You can create solutions that run on iPad, iPhone, Mac, Windows, and the web.

Solutions that are well designed allow easy collection and sharing of data in various locations, such as customer information at a sales event and safety checklists at a worksite. Imagine, for example, a safety inspector collecting data in the field with FileMaker Go for iPad—taking pictures, entering notes, and uploading the data to FileMaker Server so that FileMaker Pro users in the office can see and use the data right away. The products that make up the FileMaker Platform work together to let users see and interact with the same information in real time.

In this lesson, you will learn about the different products in the FileMaker Platform, what they do, and how they work together.

# What are FileMaker Solutions?

A FileMaker solution is made up of one or more files that resolve business issues and improve data management. Well designed solutions that are customized to meet the specific needs of a business, help employees do their jobs more quickly and easily, reduce operating costs, and enhance customer satisfaction.

A custom FileMaker solution may contain the following components:

## Data

Almost every application today—an online catalog, an address book, a calendar—is driven by a database engine. All these applications store and retrieve a variety of data in a structured format.

A database contains two parts: a data structure and the data that lives within that structure. FileMaker has a database at its core for creating structure like tables, fields, and relationships. This provides the foundation for users to interact with the data stored in the structure.

## Interface

In a solution, the interface provides users with a way to view and interact with the data. A well designed solution will incorporate business rules for what and how the user enters, finds, and views data. The interface revolves mostly around layouts and layout objects.

## Solution Logic

Solution logic adds automation to make users more productive. The two main tools FileMaker Pro provides for automating solution logic are calculations and scripting. Calculations provide access to complex, calculated data, requiring less interaction from users. Scripts allow users to complete tasks quickly and efficiently by automating certain portions of the business process or by guiding the users through the process. Both scripts and calculations increase data integrity by standardizing business processes.

## **Reporting**

FileMaker Pro provides step-by-step reporting tools, including eye-catching charts to help analyze and summarize data in meaningful ways. You can easily create and email reports in Excel or PDF format to share with others. FileMaker makes this possible by combining data, interface, and solution logic.

## **Integration**

Integrating a FileMaker solution with other technologies can improve the efficiency of your workgroup and extend the capabilities of a solution. The FileMaker platform allows you to import and export to file formats like Excel and comma-separated text, work with data in ODBC compatible systems like SQL Server and MySQL, display web pages on your layouts, and much more.

## **Security**

Security is a critical component of any modern system. FileMaker Pro has built-in tools that allow you to manage the security of your FileMaker solution. You can restrict access to entire FileMaker files as well as individual tables, records, fields, layouts, scripts, and so on.

## **Deployment**

Providing access to a solution by one or more users is possible through FileMaker deployment capabilities. FileMaker solutions are often hosted on FileMaker Server, giving consistent access to multiple users, as well as providing other benefits like automated backups and secure data connections.

## **The FileMaker Advantage**

The FileMaker Platform combines data structure, interface, scripting, and calculations to create a cohesive developer and user experience. Since these tools are available in a single platform, a separate database administrator, UI designer, and programmer are not always necessary to create a business solution. With the help of the tools and templates provided within FileMaker products, a single knowledge worker with a solid understanding of the FileMaker Platform can create a custom solution for their department or organization.

FileMaker solutions can often be created in days or weeks rather than months or years. Modifications and feature additions can be done in minutes or hours.

You can start small and grow your solution over time. Keep in mind that building more complex solutions requires planning, preparation, and knowledge of the product features. The FileMaker Training Series provides instruction on these steps.

# Product Line

## How Products Work Together

The FileMaker Platform is a line of products that work together to help you streamline your business.

You start with FileMaker Pro on a Windows or Mac computer to create your custom business solution. Or consider FileMaker Pro Advanced for additional development and customization tools.

To run your solution on iPad or iPhone, use the free FileMaker Go app which is available on the App Store.

For a small team with occasional access, FileMaker Pro can share solutions with up to 5 other FileMaker Pro or FileMaker Go users (shown in Figure 1).



FIGURE 1

For larger groups and essential business solutions, FileMaker Server is a better option. Along with sharing, FileMaker Server also provides additional security and many robust features, including the ability to access your solution from a web browser, using FileMaker WebDirect or Customer Web Publishing technologies (Figure 2).

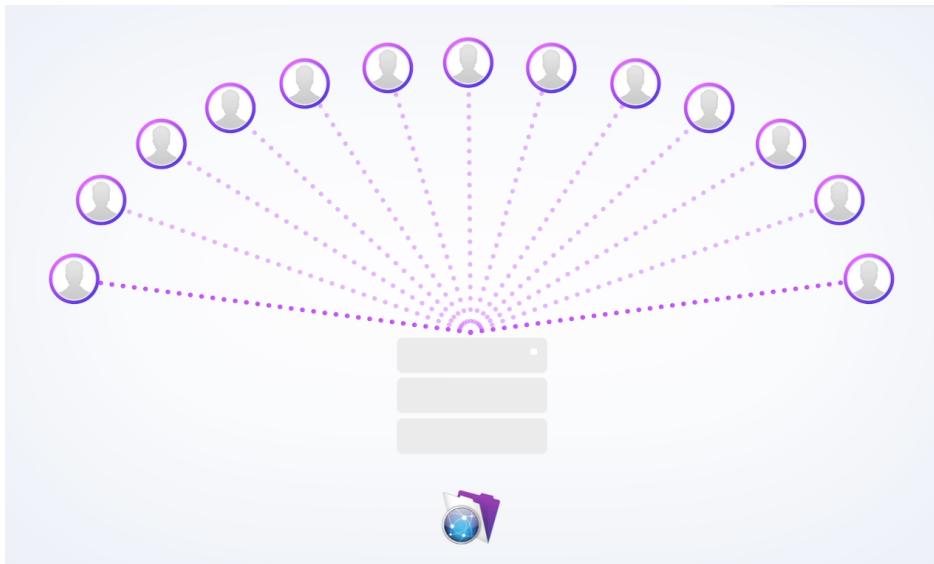


FIGURE 2

Knowing how users will connect to your solution helps determine what to purchase. Users with a paid license of FileMaker Pro on Windows or Mac can connect to FileMaker Server for no additional cost. Users with web browsers, or users running FileMaker Go on iPad and iPhone, require paid connections to FileMaker Server. These are called concurrent connections.

For example, a team with several members connects to FileMaker Server using an iPad, iPhone, or web browser throughout the day. At various times, there are different numbers of users connected (as shown in Figure 3). The number of concurrent connections needed is determined by the maximum number of people connected at any one time using an iPad, iPhone, or web browser.

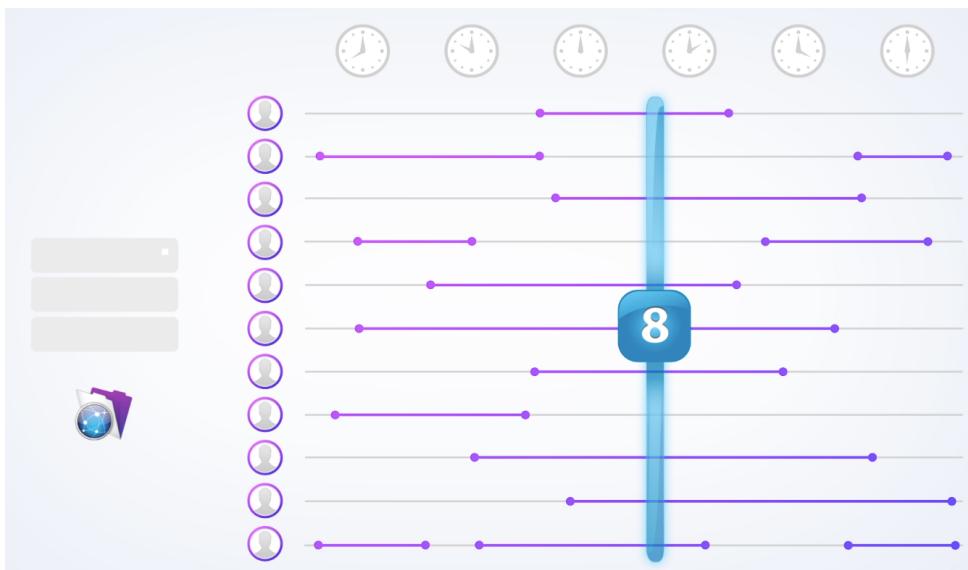


FIGURE 3

FileMaker Server comes with one concurrent connection so you can test your solution using an iPad, iPhone, or web browser. You can purchase additional concurrent connections in groups of 5.

For example, if the maximum number of people connected at any one time using an iPad, iPhone, or web browser is 8, you will need to purchase two groups of 5 concurrent connections to equal 10 connections. As your team grows, you can add more concurrent connections in groups of 5.

If you need more than 50 concurrent connections, purchase a FileMaker Server with Unrestricted Concurrent Connections. This server removes the restrictions on the number of concurrent connections and is limited only by your hardware configuration and the complexity of your solution.

In summary:

- Use FileMaker Pro or FileMaker Pro Advanced to create and run solutions on Windows or Mac. Purchase a FileMaker Pro license for each Windows and Mac user.
- Use FileMaker Go to run solutions on iPad or iPhone. Download the free FileMaker Go app for each iPad and iPhone user.
- When using FileMaker Server to share your solution with larger teams and to enable web browser connections, purchase licenses of FileMaker Pro for all your Windows and Mac users and purchase the appropriate number of concurrent connections for your iPad, iPhone, and web browser users.

## Product Descriptions in Detail

While the products in the FileMaker Platform are designed to work together, they each have their own roles and capabilities. For the latest technical specs and hardware requirements, visit the FileMaker website.

### FileMaker Pro 13

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FileMaker Pro is desktop software for Windows and Mac that allows you to design and build custom solutions, and to use solutions built by others.

FileMaker Pro provides tools to define data structure, create layouts to view data, and share data with up to five other network connected users, called "peer-to-peer" sharing. (The "peer-to-peer" data sharing works well for lightweight uses, but FileMaker Server is the best tool for sharing FileMaker solutions.)

## FileMaker Pro 13 Advanced

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FileMaker Pro Advanced is also desktop software for Windows and Mac and has all the features of FileMaker Pro plus additional programming and development tools, including script debugging, and the ability to create custom menus and database design reports.

The Script Debugger and Data Viewer are useful troubleshooting tools for solution logic. The Script Debugger allows developers to walk through scripts step by step for testing purposes. The Data Viewer can be used to monitor fields and variables while scripts are running and write and test calculations before using them for real business purposes.

There are also tools for customization of a solution. Custom Menus let FileMaker developers take control of the organization and behavior of the menubar, and Custom Functions let FileMaker developers create their own functions to use in the FileMaker calculation dialog.

FileMaker Pro Advanced also contains tools for creating a Database Design Report (DDR), which documents the internal structure of a FileMaker solution. FileMaker Pro Advanced is also necessary in order to enable features like file encryption and kiosk mode for your solution.

The additional tools in FileMaker Pro Advanced are an essential part of a developer's toolkit, making it a must-have product for those who will be creating or maintaining solutions.

## FileMaker Go 13

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The FileMaker Go app allows users to access FileMaker solutions on iOS devices, including iPad, iPad mini, iPad Air, iPhone, and iPod touch. The app provides access to hosted (online) or locally stored (offline) FileMaker solutions.

For FileMaker solutions that are hosted, the iOS device must be connected to a network via Wi-Fi or a cellular connection to access the solution. Similar to FileMaker Pro, data entered while working on a mobile device will be immediately available to all other connected users.

FileMaker Go can also access a FileMaker solution stored locally on the device for offline use. By using FileMaker scripting or a commercial solution, the offline data can later be synchronized with a hosted solution for sharing among many users.

## FileMaker Server 13

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FileMaker Server software acts as a server for hosting FileMaker solutions. Hosted solutions can be used by hundreds of people at the same time with the data shared securely between the server and users. FileMaker Server can also allow access to FileMaker solutions via FileMaker WebDirect, which provides access through a user's web browser.

FileMaker Server can:

- Run scheduled, automated backups of database files
- Log usage and performance statistics
- Execute server-side scripts, including FileMaker scripts and system-level scripts (including Windows batch, Perl, VBScript, and AppleScript)
- Provide secure data transfer over networks
- Deploy a solution to anyone with a compatible web browser, without using web authoring tools or other technologies, via FileMaker WebDirect

FileMaker Server also includes the FileMaker API for PHP and XML Custom Web Publishing (CWP). Developers who are skilled in those technologies can use this API to build dynamic websites that interact with FileMaker solutions.

# FileMaker Version Compatibility

The FileMaker 13 Platform uses a specific file format that has been available since FileMaker 12. Files created in this format have the extension of **.fmp12**. For users of FileMaker versions prior to 12, it will be necessary to convert older file formats to the new **.fmp12** format before taking advantage of FileMaker 13.

More information on converting to FileMaker 13 can be found here:

<http://www.filemaker.com/products/filemaker-pro/conversion.html>

# Accessing a Solution

When building a FileMaker solution, it helps to keep in mind how it will be accessed. A single FileMaker solution can provide different functionality based on the platform from which it is accessed. For example, people using the same solution may use:

- FileMaker Pro as a robust way to create, edit, and review orders
- FileMaker Go to change the status of an order while in the warehouse, get a signature from the recipient, and email the client a receipt of the order
- Web browser via FileMaker WebDirect for clients to check the status of their order

FileMaker Pro has the flexibility and power for you to build layouts for all platforms in one solution. Following are the benefits of each product and platform:

## FileMaker Pro

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FileMaker Pro takes full advantage of the screen size and processing power of being a native app on Windows and Mac.

## FileMaker Go

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FileMaker Go benefits from being on an iOS device, making your data more portable. It also takes advantage of some device specific features:

- Take a photo or record a video with the built-in camera and store it in a FileMaker solution
- Enter or find data by using the camera as a bar code scanner
- Dial phone numbers stored in a FileMaker solution
- Add location data (latitude and longitude) to records
- Capture signatures

## FileMaker WebDirect

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FileMaker WebDirect provides a rich user experience similar to using FileMaker Pro. It is ideal for working with teams located in remote offices to easily share information. Use FileMaker WebDirect to securely collect information like status updates, surveys, feedback forms, and more from geographically dispersed colleagues and associates.

However, there are functionality differences between FileMaker Pro and FileMaker WebDirect that make it better suited as a complementary client rather than a replacement client in many situations.

While FileMaker WebDirect is not blocked from running on Mobile devices, such as Android, the initial version has not been optimized for touch devices, primarily in the areas of touch-appropriate application UI. The performance on mobile devices will not be as good as a desktop due to the differences in resources such as CPU and memory.

## Comparison

For a feature by feature comparison, please read our FileMaker WebDirect Guide:

[https://fmhelp.filemaker.com/docs/13/en/fm13\\_webdirect\\_guide.pdf](https://fmhelp.filemaker.com/docs/13/en/fm13_webdirect_guide.pdf)

# Real-World Use Cases

FileMaker solutions are used to streamline a wide range of functions including: project management, asset management, invoicing and billing, catalog creation, customer relationship management (CRM), patient records management, film and video production, sales and advertising management, and customer service.

Custom solutions created for an organization's particular needs often involve forms, are data-driven, incorporate workflow and business rules, are shared by teams, and integrate with existing business systems. There are many real-world examples of how people use FileMaker solutions showcased on the FileMaker website at:

<http://www.filemaker.com/solutions/customers/>

A few examples are highlighted below:

## FileMaker Go in College Admission and Recruiting

Recruiters for Berklee College of Music, in Massachusetts, use a custom iPad solution to keep track of thousands of applicants and link to previously taped recordings of their performances. The Admissions staff reviews the information on iPad devices and on Mac computers. The system also incorporates data such as student ID numbers from a legacy student information system, and online applications and transcripts from a SQL database.

"FileMaker Go has become the core element that has helped us meet the demands of auditioning students with different musical and cultural backgrounds from 83 different countries and all 50 states," says Damien Bracken, Dean of Admissions. "I doubt we could continually succeed in identifying, assessing, and recruiting talent on the level and scale we have without FileMaker and FileMaker Go."

## Tracking Inventory and Sales with FileMaker Go

The Vienna Benetton Mega Store simplified inventory management and point of sales information access by implementing a FileMaker solution.

Before using FileMaker Pro, employees took every garment from the hanger and captured its data with a bar code scanner connected to a computer. Then they put the scanner aside and reached for a camera. Each product and every color variation had to be photographed and each picture stored manually on the computer. The employees filed each picture with its order number in Benetton's merchandise management system. It was time-consuming and complicated.

Christian Glöck, Benetton's IT system administrator, realized that the iPad could be the solution Benetton needed thanks to the built-in camera and portability. With a customized FileMaker solution and iPads, the staff quickly photographs each item and scans its bar code, matching the bar-coded info to each image. This enables their co-workers to later track the inventory, see what's in stock, follow the paperless trail, and move that inventory off the sales floor and into customers' hands.

## **Streamlining Work Orders with a FileMaker Solution**

The Austin Convention Center in Texas created an iPad work-order solution that enables maintenance and technical services teams to spend more time on the show floor with customers and less time walking to and from the service desk. This solution connects workers on the floor to dispatchers located in the back office.

Previously, work orders were based solely on faxes and paper. The orders were keyed into the system, printed out, and placed in a binder with diagrams and other paperwork to start deployment or fulfill changes. Since implementing their FileMaker solution, the needs of the customers are documented immediately and workers are notified much faster than by fax or paper.

## **Providing Medical Documentation via FileMaker Go**

Henry Schein Dental is one of the largest worldwide providers of healthcare products and services to dentists, doctors, and veterinarians. Sales consultants are armed with a custom sales literature solution created in FileMaker Pro and running on FileMaker Go for iPad. The solution lets them search through thumbnails, pull up pertinent literature, order a PDF or print version, and hand over personalized, "just-in-time" sales materials on the spot.

For those who do not yet have an iPad, Henry Schein Dental uses the FileMaker API for PHP to deliver the same custom sales literature solution to sales consultants using a web browser on their desktop and laptops. As a result, speed of customer communication and knowledge of the available sales tools have improved significantly.

On the back-end, FileMaker Server tracks quantities of sales materials to determine exactly what needs to be printed, saving potentially tens of thousands of dollars previously wasted on overstocked, never-used brochures. Jon Baucom, Director of Marketing, and others on the marketing team can use FileMaker Pro on Windows and Mac computers to generate reports automatically and to chart inventory levels and popularity of specific pieces to continually improve and streamline the production process.

# Getting Started Tour

It is recommended that you review the **Getting Started Tour** built into FileMaker Pro and FileMaker Go prior to proceeding with the rest of the FileMaker Training Series: Basics.

While the **Getting Started Tour** cover foundational information about FileMaker Pro and FileMaker Go, the FileMaker Training Series: Basic will cover those topics and many others in much more depth.

You can access the **Getting Started Tour** in FileMaker Pro, upon opening it the first time or through the **Quick Start Screen**, found in the **Help** menu (shown in Figure 4).

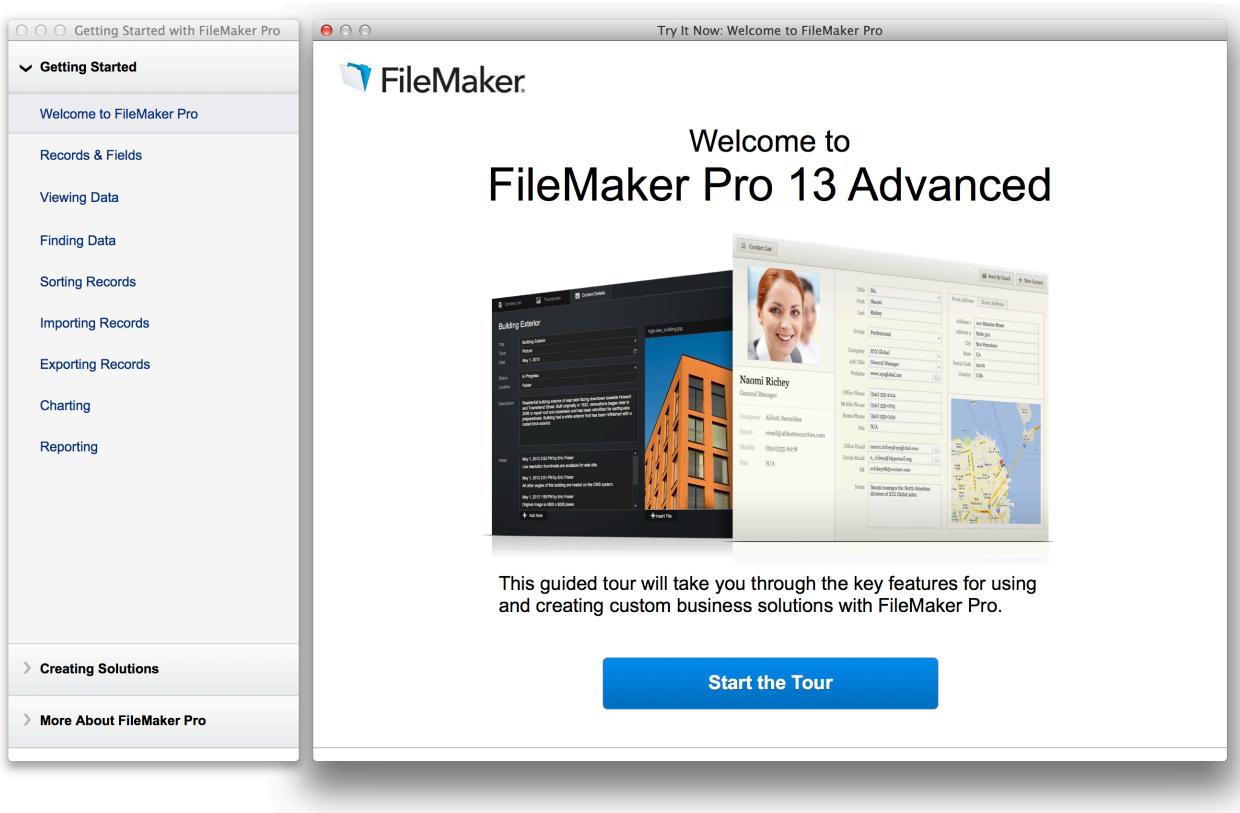


FIGURE 4

In the **Getting Started Tour** in FileMaker Go for iPad, you learn:

- How to use different data types on an iPad or iPhone
- That Camera, Audio, and Signature are unique to Container Fields on the iPad and iPhone
- That Photo, Music, and Files presumes the content is available on your device
- How to find, sort, or export data from an iPad or iPhone

You can access the **Getting Started Tour** in FileMaker Go, upon opening it the first time or by tapping on **Getting Started** in the file list screen, as shown in Figure 5.

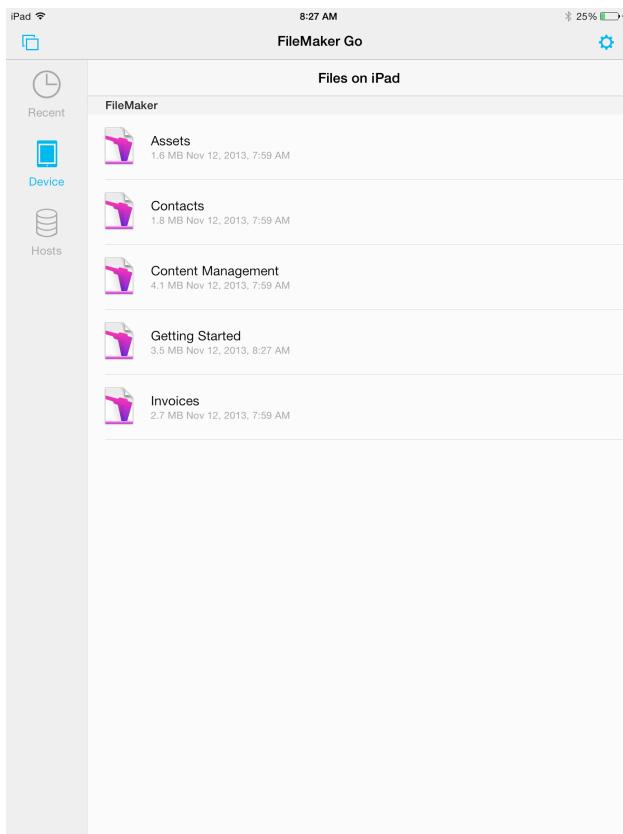


FIGURE 5

# Review Questions

1. Describe two real-world use cases of a FileMaker solution.
2. What is the recommended way to share a FileMaker solution with multiple users?
3. Explain the software and hardware you need to design and build a FileMaker solution.
4. When do you need to purchase concurrent connections?
5. Describe two methods by which FileMaker Go can access a FileMaker solution.

# Answers

1. Berklee School of Music uses FileMaker Go on iPads to streamline recruiting for applications around the world. The Austin Convention Center replaced paper work orders with FileMaker on iPads. A Benetton Mega Store simplified inventory management and point of sales information. Additional use cases include client management, project tracking, event registrations, field research, and student information.
2. The best way to share a FileMaker database with multiple users is by hosting the file on FileMaker Server.
3. In order to design and build a FileMaker solution, you need FileMaker Pro or FileMaker Pro Advanced running on a Mac or Windows computer.
4. You need to purchase concurrent connections for FileMaker Server when you have users accessing your solution from an iPad, iPhone or web browser.
5. FileMaker Go can access FileMaker solutions that are stored locally on an iOS device, or it can access hosted solutions over Wi-Fi or a cellular network connection.

## Lesson 2

# Using Starter Solutions

---

**Time:** This lesson takes approximately 20 minutes to complete.



# Objectives

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**After this lesson, you will be able to:**

- Determine when a Starter Solution best fits your needs
- Understand why Starter Solutions are useful for desktop and mobile development
- Create a file that's accessible on your iOS device through FileMaker Go

There are three primary methods for creating a solution: beginning with a Starter Solution and modifying it to meet your needs, importing data from another source, and creating a solution from scratch.

This lesson will explain how to start by using a Starter Solution.

FileMaker Pro comes with 16 built-in Starter Solutions that are professionally-designed templates customized for managing tasks on iPad, iPhone, desktop and the web. You will be able to get started managing contacts, assets, content, invoices, and more in just minutes. Plus, you can easily modify the Starter Solutions for your own unique needs.

# Choose a Starter Solution

Starter Solutions are fully built FileMaker solutions that allow users to manage many different types of information. They are also easily customizable by adding fields, rearranging layouts, and even copying or importing elements from a different Starter Solution.

To use a Starter Solution, simply go to the **Quick Start Screen** (in the **Help** menu), then choose **Use a Starter Solution**. Select a solution, save it to your desktop, then explore the template by entering data.

The list below summarizes the features, required skill level, and the data that can be stored for each of the Starter Solutions. Open and explore each of them to become acquainted with what each solution does—and how it works.

## **Assets - Beginner**

---

Tracks office assets and other depreciable items. Fields include: asset category, serial number, and purchase date. Calculates depreciation using the straight-line method.

## **Contacts - Beginner**

---

Manages complete contact information for all your business relationships, including multiple addresses, phone numbers, email address, and more.

## **Content Management - Beginner**

---

Tracks different media files and relevant categorical and status information, as well as details about their revision history.

## **Expense Reports - Intermediate**

---

Tracks and reports reimbursable expenses.

## **Inventory - Intermediate**

---

Tracks inventory items, including category, value, and more. Also tracks stock transactions and company information.

## **Meetings - Intermediate**

---

Monitors meeting minutes and summaries, as well as action items and responsible parties.

## **Personnel - Intermediate**

---

Manages employee data such as hire date, salary, manager, time off and date of next review. Integrates the information with the Expense Report template for more detailed information on every employee.

## **Projects - Intermediate**

---

Manages project descriptions, a history of active and completed tasks, and all personnel associated with an assignment.

## **Research Notes - Intermediate**

---

Compiles and organizes all research notes in one location. It also helps track web search notes.

## **Resource Scheduling - Intermediate**

---

Manages the scheduling and commitment of resources. A resource can be a speaker, conference room, or projector.

## **Time Billing - Intermediate**

---

Calculates hours worked, hours billed, and the hourly rate for each employee on a weekly basis. Provides a way to track billing by customer.

## **Estimates - Advanced**

---

**Features:** Manages data for customer estimates, such as products, terms, discounts, tax rates, and more—and keeps track of how the information relates to both relevant customers and products. Easily prints estimates

## **Event Management - Advanced**

---

Tracks event details including tasks, agenda, invitees/guests, contributors, gifts, and thank you notes.

## **Invoices - Advanced**

---

Similar to the Estimates template, but with data targeted toward invoicing needs. Manages contacts, products, and invoicing. Great for small businesses.

## **Tasks - Advanced**

---

Tracks tasks and their owners for any project, and instantly access details through each step.

# Quick Mobile Development

If you want to create a FileMaker solution, many of the Starter Solutions provide an excellent framework for mobile use with FileMaker Go. All solutions are designed to detect how it is being accessed, then display an optimized view of data. Personnel Records, Research Notes, and Time Billing all have specific iPad layouts—and the other solutions have layouts that are designed for both iPad and iPhone.

Complete the following activity to learn some of the features of Starter Solutions that are optimized for iOS.

## Activity 2.1: Exploring the Event Management Starter Solution

1. Open FileMaker Pro 13. The **Quick Start Screen** opens automatically—if it does not, select **Quick Start Screen** in the **Help** menu.
2. Choose **Use a Starter Solution...**, then choose **Event Management**.
3. Name the file "**Event Management.fmp12**" and save it to your desktop. After the file is saved, the solution opens to the **Event Details** layout.
4. Enter some test data of your own in the record that the solution created.
5. Add a few tasks, as pictured in Figure 6.
6. Close the file.

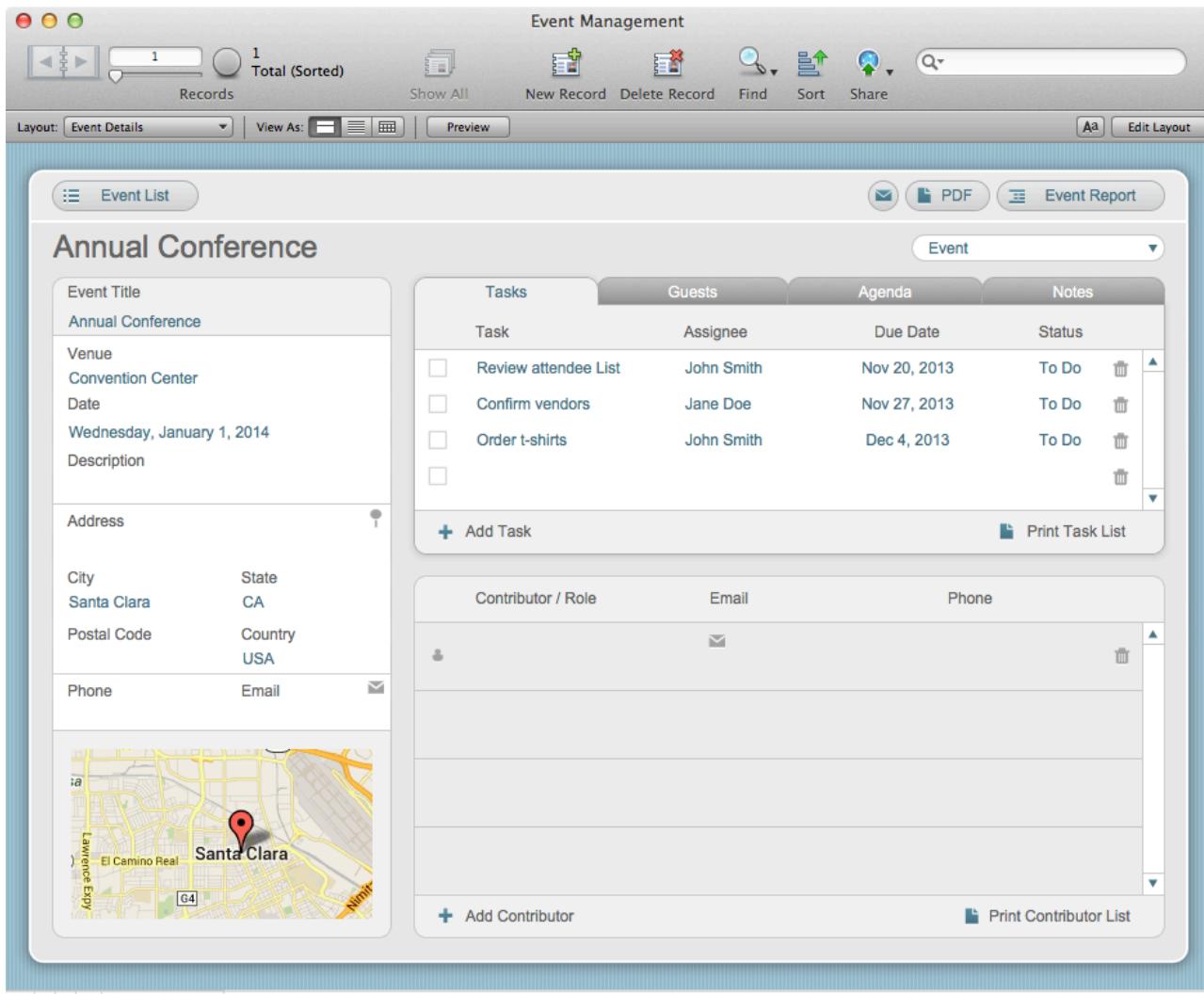


FIGURE 6

7. Email the Event Management file to an email account that you can access on an iPad or iPhone.
8. On an iPad or iPhone with the FileMaker Go 13 app installed, tap the Event Management file attached to your email, then choose **Open** in FileMaker Go.
9. Tap the name of the event to see the **Event Details** layout, which should look like Figure 7.

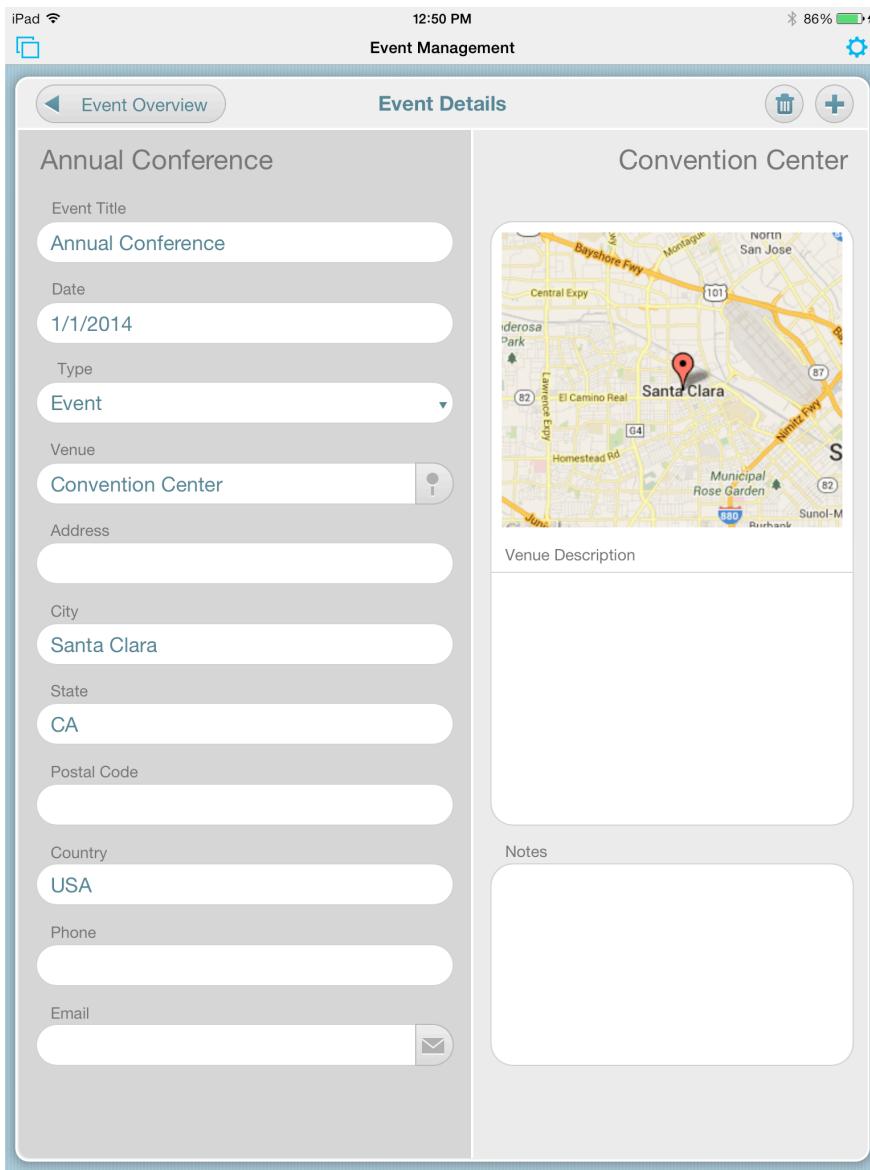


FIGURE 7

Several features of Starter Solutions are optimized for iOS:

- **Device detection** - Solutions are automatically set to the layouts that are optimized for each platform—desktop, iPad, or iPhone—with no further development required.
- **Space optimization** - The optimized layouts are designed to save space and present the most relevant data. For example, the Event Overview layout shown in Figure 8 uses a list view for Tasks rather than a portal because users can see and manipulate more information in less space.
- **Easy data entry** - All the layout elements are the optimal size for data entry based on the device.

iPad 12:43 PM 85%

Event Management

Event List PDF

Annual Conference Wed, Jan 1, 2014

Details Annual Conference Convention Center >

Guests 0 People 0 Attending >

Contributors 0 People 0 Assigned >

Agenda 0 Items 0 Current >

Tasks (3)

To Do

TASK	DUE DATE	ASSIGNEE
<input type="checkbox"/> Order Items	Dec 4, 2013	John Smith
<input type="checkbox"/> Confirm Vendors	Nov 27, 2013	Jane Doe
<input type="checkbox"/> Review attendee List	Nov 20, 2013	John Smith

Add Task Print Tasks



FIGURE 8

# Review Questions

1. If you need to create a solution that keeps track of customers, products, and purchase orders, which Starter Solution should you use?
2. Which template would you use to build an iPad solution for a scientist who needs to collect lab notes?
3. What are the main differences between the Starter Solutions for Assets and Inventory?
4. Describe one possible use of the Starter Solution for Content Management.
5. What are three features that make Starter Solutions so helpful to mobile development?
6. Which Starter Solution helps track an employee's time off?

# Answers

1. The Starter Solution for Invoices works best in this situation—to keep track of customers, products, and purchase orders.
2. Research Notes is ideal for this solution.
3. The Assets solution tracks office assets and other depreciable items. Its fields include asset category, serial number, and purchase date. It calculates depreciation using the straight-line method. The Inventory solution tracks product inventory items, including category, value, and more.
4. The Content Management solution tracks different media files and relevant information such as categories and status, as well as details about their revision history. It can be used for images, documents, videos, and much more.
5. The three features that make Starter Solutions helpful to mobile development are solutions that show a layout that's optimized for each device, they're built with layout features that optimize space and viewing on mobile devices, and they were designed for easy data entry with Multi-Touch gestures.
6. Personnel Records helps track an employee's time off.

## Lesson 3

# Viewing and Working with Data

---

**Time:** This lesson takes approximately 20 minutes to complete.

**Lesson File:** Contacts.fmp12



# Objectives

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After this lesson, you will be able to:

- Describe the function of a layout, and give examples of when different layouts might be needed
- List and describe when to use the four modes within layouts
- Compare and contrast the three layout views
- Describe two methods to navigate between records
- Create a new record
- Add, modify, save and delete data

Now that you have learned about Starter Solutions, we will use the Contacts Starter Solution with data in it to help you navigate, organize and work with data in a FileMaker solution. In this lesson, you will learn about layouts, records, different modes to work with your solution, and different ways to view and edit your data.

Here is what you learned from the **Getting Started Tour**.

- Getting Started > Record & Fields
  - A database file is organized into tables. Tables store records. Each record is a collection of information stored in fields.
  - Fields hold data including text, numbers, dates, images, and more.
- Getting Started > Viewing Data
  - FileMaker Pro displays fields on layouts.
  - Databases can have layouts for viewing forms or reports, printing labels, entering data on iOS devices and more.
  - **Browse, Layout, Find and Preview** are layout modes.
  - You can display layouts in **List View, Table View or Form View**. These are layout views.

# Layouts

Layouts provide the user interface for a FileMaker solution and organize how you see information. Whether you're entering data or printing reports, the layout handles how the data is displayed. Layouts do not store data. You can create many layouts to see the same record—or set of records—in different ways. For comprehensive instruction about layouts, refer to Lesson 9.

## Switching Layouts

To move to different layouts, use the **Layout** pop-up menus shown in Figures 9 and 10.



FIGURE 9

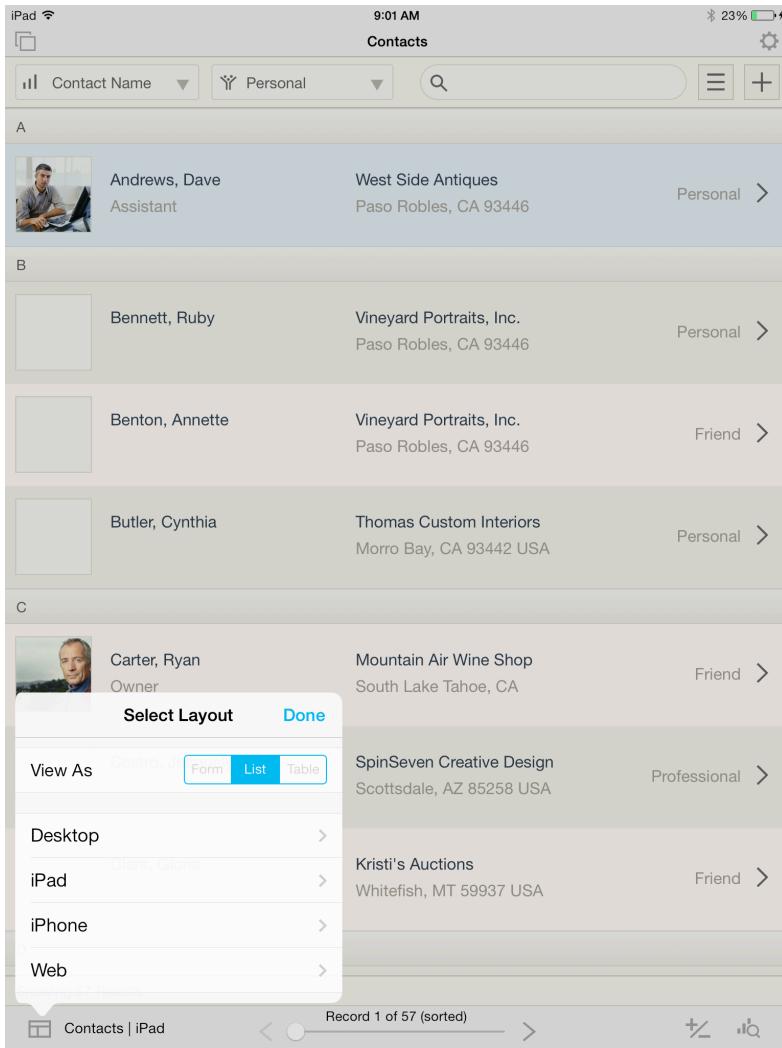


FIGURE 10

When you switch to a different layout, you might see the same records or a different set of records depending on the context of the layout. For example, you might start with a **Contact Details** layout that shows each contact as a form, then switch to a **Contacts List** layout that shows the same found set of contacts as a list. Then, you might switch to a **Company List** layout that shows a found set of company records as a list.

# Modes Within Layouts

You interact with a layout in one of four modes. In FileMaker Pro, the modes are: **Browse** mode, **Find** mode, **Layout** mode, and **Preview** mode. You can change the mode with a keyboard shortcut, through the **View** menu, or the pop-up menu at the bottom of the window as shown in Figure 11.

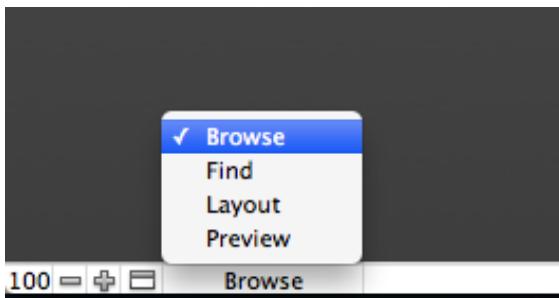


FIGURE 11

In FileMaker Go, only the **Browse** mode and **Find** mode are available.

## Browse mode

You will use **Browse** mode to do most of your work, including all data entry and viewing. You can add, view, edit, sort, omit (hide), and delete records.

The keyboard shortcut is **Command-B** in OS X or **Ctrl-B** in Windows.

## Find mode

You can search for records that match a set of criteria in **Find** mode. You enter search criteria, then perform the search, and FileMaker Pro returns all the matching records in **Browse** mode. You can then work with this subset (or found set) of records. The keyboard shortcut is **Command-F** in OS X or **Ctrl-F** in Windows.

In FileMaker Go, to enter **Find** mode, tap the magnifying glass button, then choose **Enter Find Mode** as shown in Figure 12.

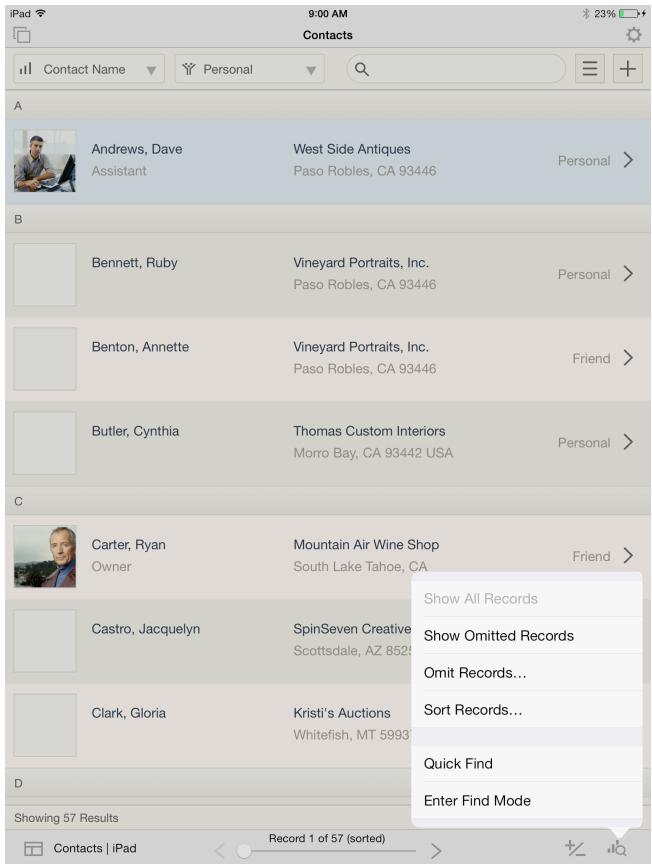


FIGURE 12

You'll learn how to use **Find** commands in Lesson 4.

## Layout mode

When you modify layouts to provide users with different interfaces to access data, you'll use **Layout** mode. FileMaker Pro uses **Layout** mode to show information both on a screen and in printed materials. This mode is not available in FileMaker Go.

The keyboard shortcut is **Command-L** in OS X or **Ctrl-L** in Windows.

## Preview mode

To see how data looks before you print it, use **Preview** mode. This mode is especially helpful to view layouts with multiple columns, and reports with summaries. This mode is not available in FileMaker Go.

The keyboard shortcut is **Command-U** in OS X or **Ctrl-U** in Windows.

# Views Within Layouts

You can display a layout using one of three views. In FileMaker Pro, select the view from the **View** menu or from the **Status Toolbar** shown in Figure 13. In FileMaker Go, you can access the **View As** options from the **Layout** pop up menu in the lower left of the screen shown in Figure 14.

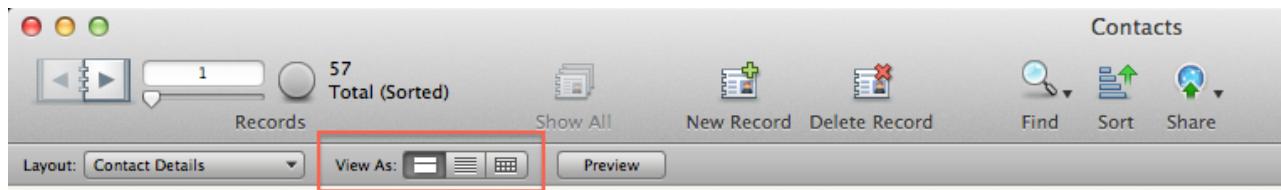


FIGURE 13

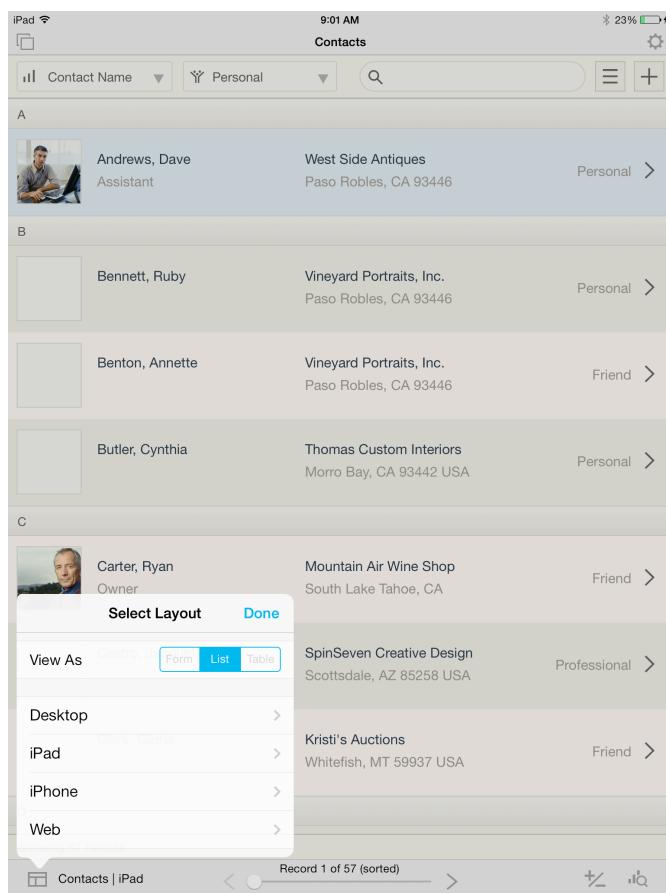


FIGURE 14

## View as Form

To view and modify records individually, use **Form** view. Though you might have multiple records, you see only one record at a time in **Form** view.

## View as List

You see a scrollable list of records in **List** view. Scroll up and down to browse through records. The number of records you can see at one time depends on the structure of the layout. The current record is marked with a thin, black bar at the left of the record, and is the record that will be affected by commands such as **Delete Record** or **Duplicate Record**. When you are in **List** view, you can click or tap a record to make it the current record.

## View as Table

People who use spreadsheets will discover that **Table** view looks very familiar. Data fields are represented as columns, and the records are represented as rows. **Table** view can be quite powerful because you have easy access to resize, reorder sort, and hide columns, and to view summary data.

# Records

You can move between records many ways. In FileMaker Pro, the status toolbar includes buttons for **Next record** and **Previous record** in a Book icon, as well as a slider shown in Figure 15. In FileMaker Go, you move between records using the slider shown in Figure 16 or with a two finger swipe in FileMaker Go 13. The **Status Toolbar** shows the current record number, the number of records in the set if applicable, and the sort status.

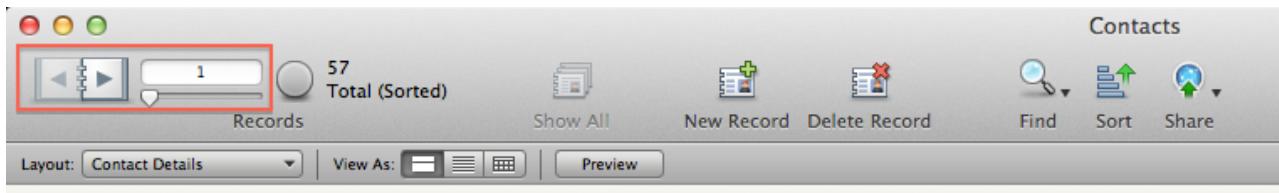


FIGURE 15



FIGURE 16

## Activity 3.1 – Moving Between Layouts and Records

Practice moving between layouts and records using the methods that were described in this lesson:

1. Open the **Contacts.fmp12** file in FileMaker Pro. The file will open to the **Contact Details** layout. Which view is shown?
2. Switch to the **Desktop > Contacts** layout using the **Select Layout** pop-up menu. Which view is shown?
3. Move three records ahead by clicking the **Next** button from the **Status Toolbar**. The destination record is Cynthia Butler.
4. Use the slider to go to the last record. The record should be for Steve Williams.
5. Use the scroll bar on the right side of the window to scroll to the top of the window. Notice that this action does not change the current record.

# Working With Data

When you use FileMaker Pro or FileMaker Go, you enter and interact with data in **Browse** mode.

## Creating a New Record

When entering new data, you will first create a new record. In FileMaker Go, tap on the plus/minus button and tap **Add New Record**, as shown in Figure 17.

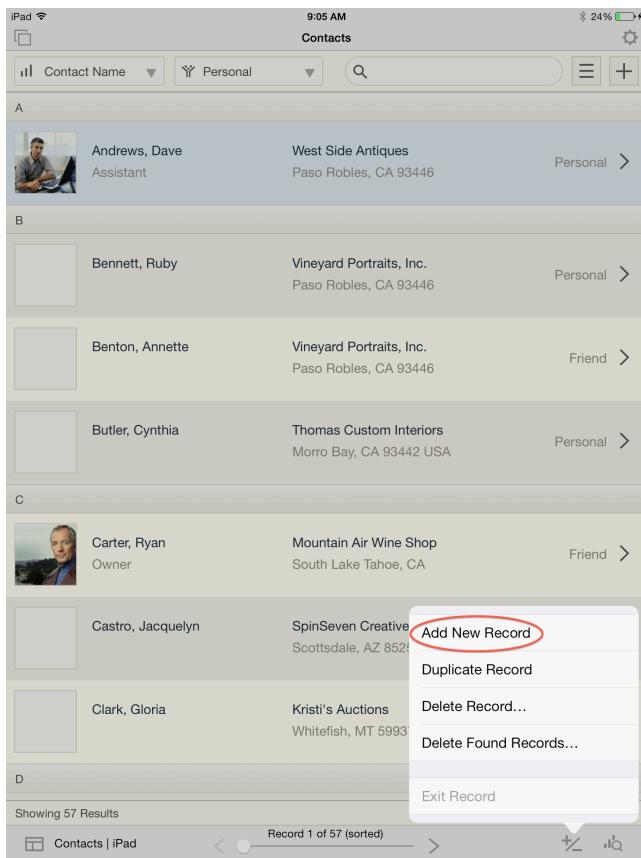


FIGURE 17

There are several ways to create a new record in FileMaker Pro. You can choose **New Record** from the **Records** menu, click the **New Record** button in the status toolbar as shown in Figure 18, or use the keyboard shortcut **Command-N** for OS X or **Ctrl-N** for Windows.



FIGURE 18

## Duplicating a Record

Duplicating a record can be an efficient way to create a new record. For example, if two people live at the same address, you can duplicate one person's record and change only the details about the second person that are different. In an Event Management database, you can duplicate a record to create new records for events that are similar to each other, again changing only the details that differ.

To duplicate a record in FileMaker Go, tap on the plus/minus button and tap **Duplicate Record** as shown in Figure 19.

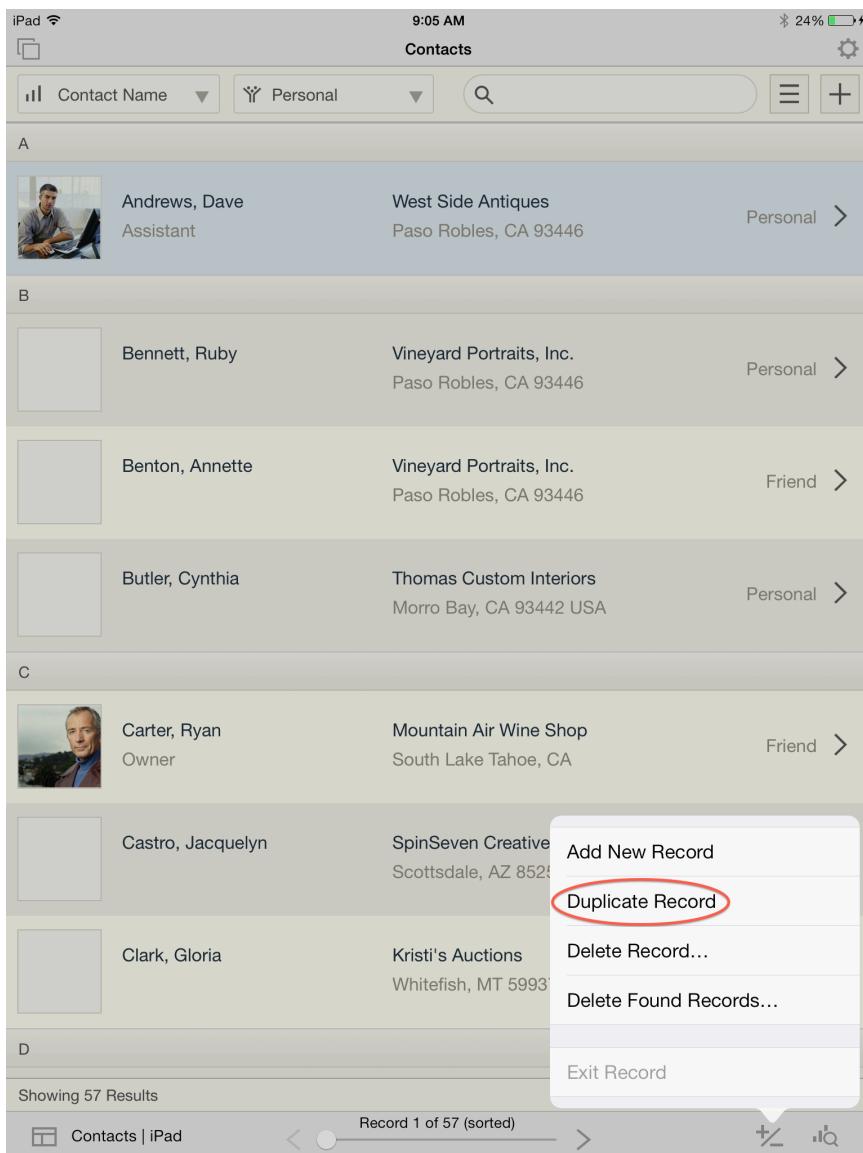


FIGURE 19

In FileMaker Pro, choose **Duplicate Record** from the **Records** menu or use the keyboard shortcut **Command-D** for OS X or **Ctrl-D** for Windows.

## Modifying Data

To enter data in a field in FileMaker Go, first tap in the field to make it active. Then use the **Next** and **Previous** buttons above the keyboard to move through the fields. In FileMaker Pro, click in a field or use the **Tab** key to move from field to field. **Shift-Tab** will move you backwards through the tab order.

Some fields may require different types of data entry. Many fields are formatted as edit boxes that allow you to enter data. Other fields will have pull-down menus, radio buttons, or checkboxes to select data. If a field is set as a date, time, or timestamp, you must enter a valid value.

## Saving Data

When you enter data, the record is not saved, or committed, to the file until you take one of four actions:

- Change modes
- Change to a different record
- Change to a different layout
- Click or tap outside of all fields in the record (such as the background)

While, by default, changes you make to the data are automatically saved as you work, you can configure any layout to ask you to confirm record changes. In the **General** tab of the **Layout Setup** dialog shown in Figure 20 uncheck **Save record changes automatically**.

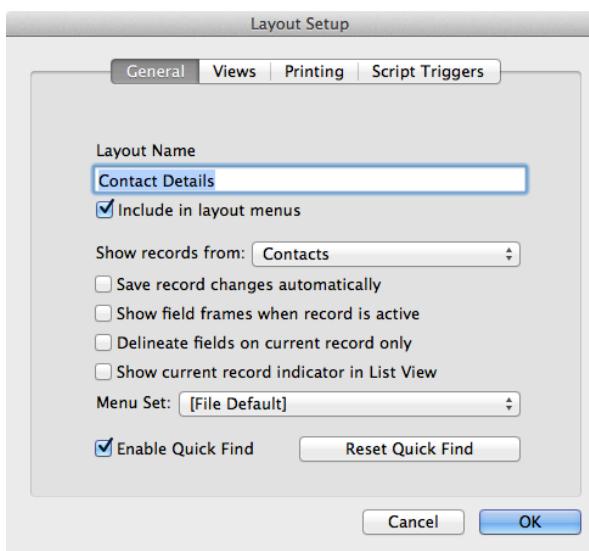


FIGURE 20

If you have entered data in a record but have not yet committed it, you can revert the record back to the previously saved version.

When a record is not committed or locked in a multi-user environment, other users will not be able to modify the record until it has been committed. This automatic record locking preserves the integrity of the data by allowing only one user at a time to modify a record.

## Deleting Data

Deleting a record in a FileMaker file is permanent. You cannot retrieve the data or undo the delete. To delete a record in FileMaker Go, tap the plus/minus button and tap **Delete Record** as shown in Figure 21.

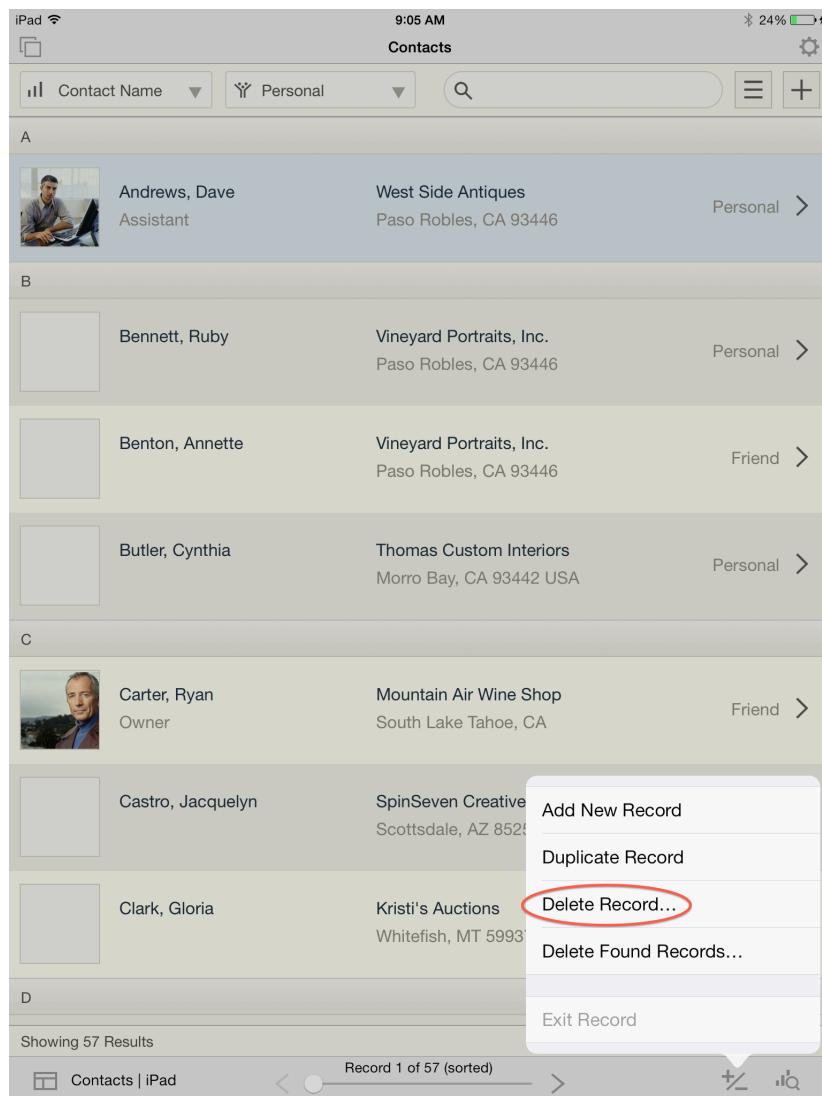


FIGURE 21

In FileMaker Pro, choose **Delete Record** from the **Records** menu, click the **Delete Record** button in the status toolbar, or use the keyboard shortcut **Command-E** for OS X or **Ctrl-E** for Windows.

In both FileMaker Pro and FileMaker Go, a dialog will ask you to confirm that you want to delete the record permanently.

## Activity 3.2 – Creating New Records and Entering Data in FileMaker Pro

Practice creating new records and editing data in the Contacts starter solution.

1. Open **Contacts.fmp12** and navigate to the **Contact Detail** layout.
2. Click the **New Record** button in the **Status Toolbar**.
3. Fill out the new record with your contact information. Use the **Tab** key on the keyboard to navigate between fields.
4. When finished, click on the background of the layout where there are no objects. This will save the record.
5. Delete your record by either click **Delete Record** in the **Status Toolbar**, or going to **Records > Delete Record**.
6. When asked to **Permanently delete this ENTIRE record**, click **Delete**.

## Review Questions

1. If you want to view a database like a spreadsheet, which view should you use?
2. When you're browsing records in FileMaker Go, how can you move to the next record?
3. Which mode would you use to create a new record?
4. What are three of the four ways that you can save, or commit, a record?
5. How many users can modify a record at once?
6. Can deleting a record be undone?

# Answers

1. The **Table** view shows the fields in columns and records in rows.
2. You tap the **Next** and **Previous** buttons to move between records or use a two finger swipe motion in FileMaker Go 13.
3. Use **Browse** mode to create a new record.
4. You can commit a record by changing layout, changing mode, changing record, or clicking or tapping outside all the fields of the current record.
5. Only one user can modify a record at once. Another user cannot modify the record until it has been committed.
6. No, deleting a record cannot be undone. The only way to recover the data would be to import the record from a backup of the database.

## Lesson 4

# Finding and Sorting Records

---

**Time:** This lesson takes approximately 20 minutes to complete.

**Lesson File:** Contacts.fmp12



# Objectives

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After this lesson, you will be able to:

- Perform complex finds
- Extend and constrain found sets
- Make use of operators in your search requests
- Sort records

In the **Getting Started Tour** in FileMaker Pro, you learned how to perform basic searches using Find mode and how to perform quick searches using Quick Find.

In this lesson, you will learn how to do more complex searches.

Here is what you learned from the **Getting Started Tour**.

- Getting Started > Finding Data
  - Use Find mode to search for records containing data stored in specific fields.
  - Use Quick Find to search across all fields on the current layout.
- Getting Started > Sorting Records
  - Sorting changes the order in which data is displayed.
  - You can sort data by multiple fields to group records.

# Specifying Search Criteria

When performing a simple search, FileMaker by default performs a "words begin with" search. This means that unless you search for exact matches, the field you are searching can contain:

- Longer words that begin with the values you specify
- Other words, in addition to the ones you specify
- Values in any order

For example, if you were to enter "mary" as the search criteria in a First Name field, your found set will include records for Mary, Mary Beth, Maryann, and Rose-Mary. But it will not find Rosemary or Jomary. Note that searches are not case sensitive (unless the indexing of the field is set to Unicode).

The quickest way to search is to use the contextual shortcut menu to find matching data in a particular field. **Right-click** (or **Control-click**) a field that has the criteria you want. Choose **Find Matching Records** from the shortcut menu and FileMaker Pro finds records that have the same value in that given field.

## Activity 4.1: Contextual shortcut for Finds

Find records matching the **Company** field for Dave Andrews.

1. In the **Contacts** file, go to the **Contact Details** layout.
2. Click **Show All** in the **Status Toolbar**, and navigate back to the first record.
3. Right-click in the **Company** field containing "**West Side Antiques**" and a pop-up menu appears.
4. Choose **Find Matching Records**. Your new found set includes all contacts that work for "**West Side Antiques**".

## Performing AND or OR Searches

It is helpful at times to find data based on multiple fields. For example, finding all contacts that are Artists at Rankin Studios. This can be done in **Find** mode by entering your criteria in each field. After you perform the search, the results will match ALL the criteria that you entered. This is known as an AND search.

On the other hand, what if you want to search for people who are Family or Friends? Rather than using multiple fields in a single search request, as you do when you perform an AND search, you can use multiple requests to perform an OR search.

## Activity 4.2: Performing AND and OR searches

Perform an AND find for Contacts who are Artists at Rankin Studios. Then perform an OR find for Contacts who work at Kristi's Auctions or Williams Design Studio.

1. On the **Contact Details** layout, enter **Find** mode by choosing **Find** mode from the **View** menu.
2. Enter "Rankin Studios" into the **Company** field and "Artist" into the **Job Title** field. Entering search terms into two or more fields within the same find request creates an AND find.
3. Click **Perform Find** in the toolbar. All artists at Rankin Studios are returned.
4. Enter Find Mode again. This time we'll create an "or" find by using multiple find requests.
5. Enter "Kristi's Auctions" into the **Company** field.
6. Click **New Request** in the status toolbar, and enter "Williams Design Studio" into the **Company** field.
7. Click **Perform Find** in the toolbar.
8. Switch to the **Contacts** layout in the upper left. Notice all contacts in the found set work for Kristi's Auctions or Williams Design Studio.

# Extending and Constraining a Found Set

When performing a new search, FileMaker Pro searches all records and replaces your previous found set with a new found set. This is handy for most searches, but occasionally it is necessary to search within a found set, or to add records to your current found set. FileMaker allows users to either extend or constrain the existing found set with the following menu options:

- **Extend Found Set:** When you extend your found set, the omitted records are searched. Any omitted records that match the search criteria are added to your current found set.
- **Constrain Found Set:** When you constrain your found set, the search is limited to only the records in the current found set. Any records in the current found set that match the search criteria are returned.

Both the **Extend Found Set** and the **Constrain Found Set** options are in the contextual shortcut menu and the Requests menu.

## Activity 4.3: Extending a Found Set

Perform a find for Contacts in the Friend group, then extend your found set to include Contacts in the Personal group.

1. On the **Contact Details** layout, enter **Find** mode.
2. Enter "**Friend**" in the **Group** field and perform the find. Notice the found set is 13 records.
3. Go back into **Find** mode and enter "**Personal**" in the **Group** field.
4. Choose **Requests > Extend Found Set**. Your results include 26 contacts in both the Personal and Friend groups.

## Activity 4.4: Constraining a Found Set

Perform a find for Contacts that work at West Side Antiques, then constrain your found set to only Assistants.

1. On the **Contact Details** layout, enter **Find** mode.
2. Enter "**West Side Antiques**" in the **Company** field and perform the find. Your results should include 6 records.

3. Go back into **Find** mode and enter "Assistant" in the **Job Title** field.
4. Choose **Requests > Constrain Found Set**. You'll see all contacts who are Assistants at West Side Antiques.

# Using Operators in Search Criteria

An operator is a symbol or instruction that gives you more flexibility with your search criteria. For example, you can search a date range by entering two dates separated by the range operator (...).

When you enter Find mode, you will see that the Status Toolbar contains a drop-down menu. You can either choose the operator from the drop-down menu or you can enter it with the keyboard.

Operators are helpful for finding ranges of dates, times, and numbers, using “wildcards” to find partial matches in text searches, or changing FileMaker’s default “words begin with” behavior. Two very popular searches involve finding records where a field is empty or finding records with a field contains data.

## Activity 4.5: Finding Empty Fields

Perform a search to find Contacts without a mobile phone number.

1. On the **Contact Details**, enter **Find** mode.
2. Enter "=" in the **Mobile** field.
3. Click **Perform Find** in the toolbar, or press the **Enter** key. The found set should contain 35 contacts without a mobile phone number.

## Activity 4.6: Finding Non-Empty Fields

Perform a search to find Contacts with a personal phone number.

1. On the **Contact Details**, enter **Find** mode.
2. Enter "\*" in the **Personal** phone field. This tells the database to find records where the field content is equal to not empty.
3. Click **Perform Find** in the toolbar, or press the **Enter** key. The found set should contain 37 contacts with a personal phone number.

## Finding Strings of Characters in a Field

Another way of using the asterisk (\*) operator is to modify the "word begins with" behavior of **Find** mode. For example, you can find all values in a **First Name** field that end with "ary" by using \*ary as your search criteria. This search would find people such as Mary, Rosemary, and Gary, but it would not find Aryanna.

If you want to find values in a **First Name** field that include "ary" anywhere in the value, your search criteria should be \*ary\*. This will find any values that start with, include, or end with "ary," so it would also find people such as Mary, Karyn, and also Aryanna.

## Finding a Range of Data

When you work with numbers, dates, and times, you may want to search for data in ranges. For example, suppose you want to find all orders shipped from the start of January to the end of March in 2014, or all items over \$500. To perform such searches, use operators like greater than (>), less than (<), or an ellipsis (...).

**Find** mode has four operators to help find data before or after a specific value: greater than (>), greater than or equal to ( $\geq$ ), less than (<), and less than or equal to ( $\leq$ ). In Find mode, place any of these operators before the value. For example, to find all assets over \$500, place “>500” in the cost field.

The ellipsis (...) allows users to find data between two values. For example, in order to find dates between the beginning of January and the end of March, enter 1/1/2014...3/31/2014 in the Ship Date field. You can select the ellipsis from the operators pop-up menu (Figure 22), type three periods, or type **Option-;** (Option–semicolon) on a OS X.

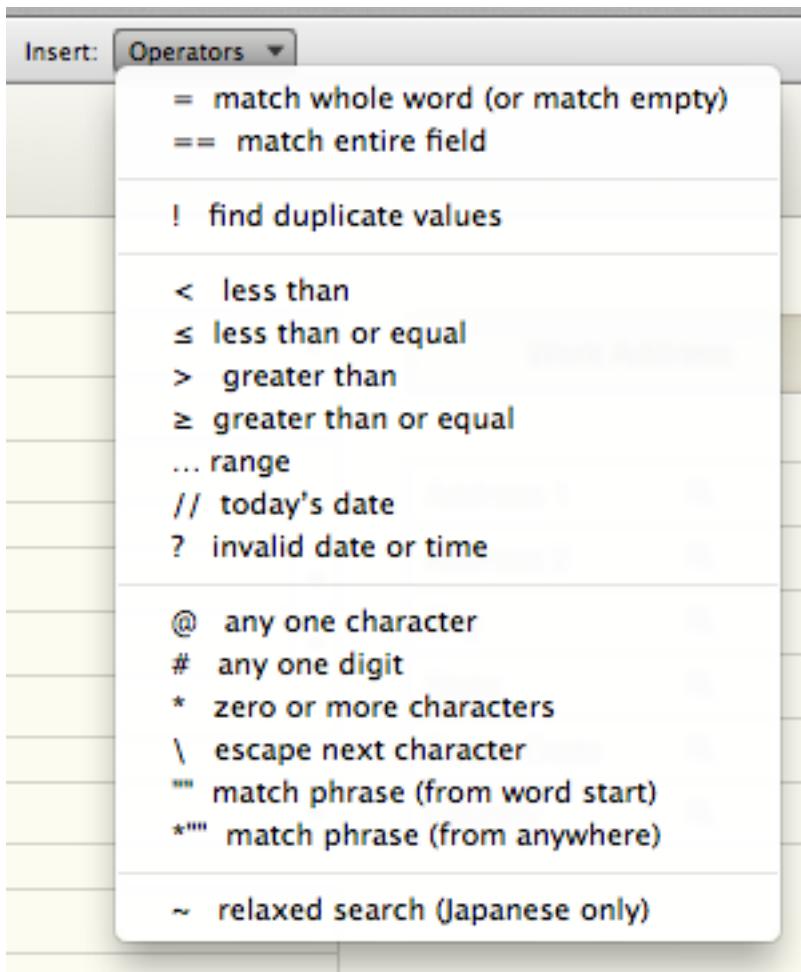


FIGURE 22

## Finding Exact Data

While the default "word begins with" logic is usually helpful in finding data quickly, it can return more records than you might want. For example, searching for "North" in a Region field results in values like "North," "Northwest," and "Northeast."

- **Exact field match:** To be more specific in a search, use two equal signs (==) to obtain an exact field match. Entering "==North" in the Region field shows only those records that have the exact value "North".
- **Exact word match:** One equal sign (=) performs an exact word match. For example, "=North" results in records containing "North" and "North Pole," but not "Northeast."

# Sorting Records

Whether you are looking at all records or a found set, it is usually helpful to sort your data. For example, you could sort contacts alphabetically by Last Name, or sort invoices in ascending date order by their Ship Date. By default, records display in the order in which they were created in the table.

To open the **Sort Records** dialog (Figure 23), click **Sort** in the **Status Toolbar**, or use the keyboard shortcut **Command-S** (OS-X) or **Ctrl-S** (Windows).

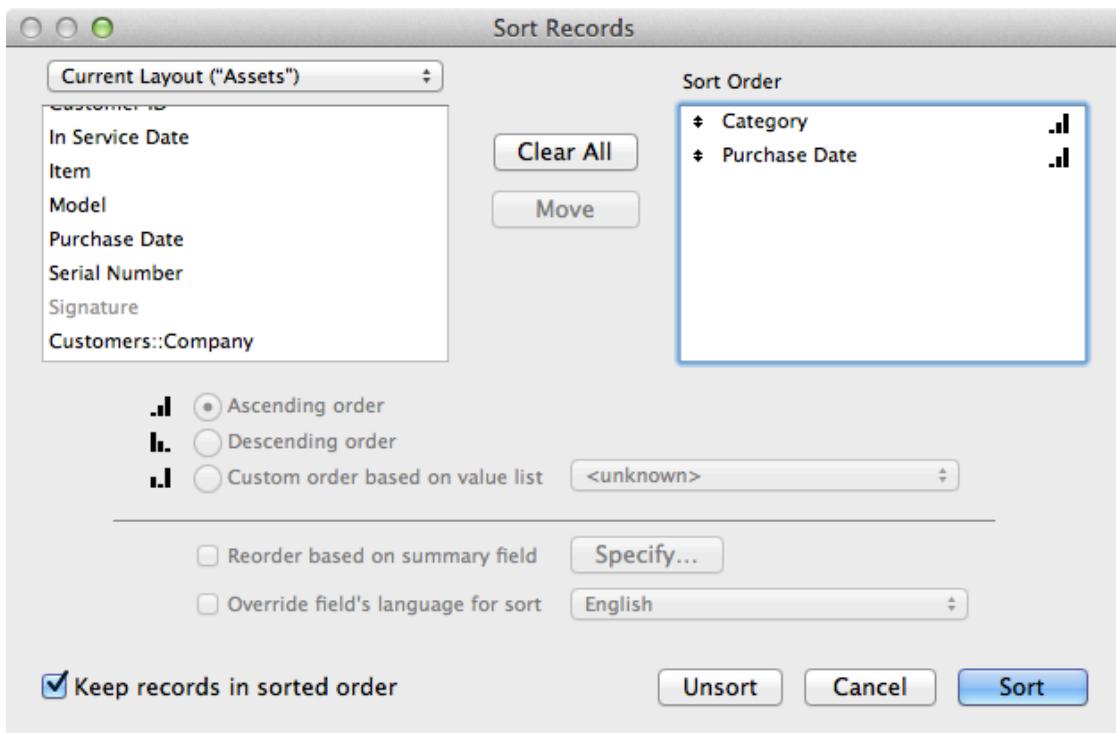


FIGURE 23

## Choosing Sort Fields

In the **Sort Records** dialog box, the left side contains a list of all the fields on the current layout. By clicking **Current Layout (...)**, you can choose to sort on other fields in the solution.

To add a field to the sort order, **double-click** the field name in the list, or select the field and click **Move**. You can sort by one field or multiple fields. In Figure 24, the data sorts by **Last** ascending, then **First** ascending.

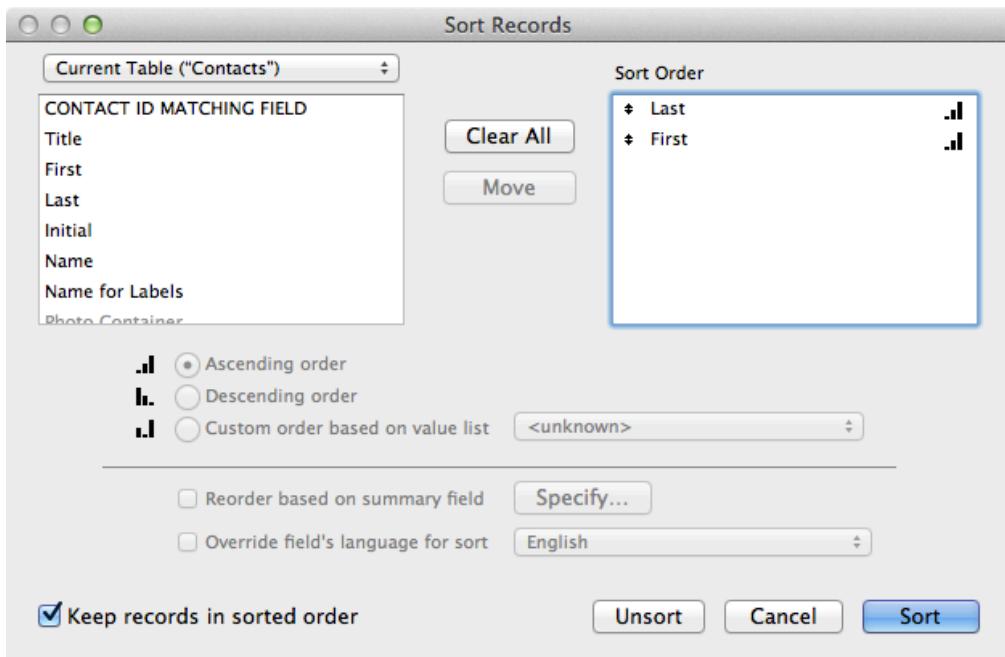


FIGURE 24

## Setting Sort Order

The icon to the right of the field in the **Sort Order** box indicates how the data will sort. To specify ascending or descending sort order for a field, select the field in the **Sort Order** pane and choose **Ascending order** or **Descending order** using the radio buttons in the middle of the dialog. You can also click the **Unsort** button at the bottom of the dialog, which returns the records to creation order.

## Review Questions

1. Describe two ways that you can perform AND searches.
2. How can you find all records with an empty field?
3. What operators allow finding of ranges of dates, times, and numbers?
4. In what order do records show if they are not sorted?

# Answers

1. Two ways to perform AND searches:
  - Type criteria into multiple fields in one single search request.
  - Perform a simple search, and then narrow the found set by using **Constrain Found** Set through the application menu or the contextual shortcut menu.
2. To find all records with an empty field, use the = sign in **Find** mode in the field.
3. The operators for finding ranges of dates, times, and numbers are: Greater than (>), Greater than or equal to ( $\geq$ ), Less than (<), Less than or equal to ( $\leq$ ), and Ellipsis (...).
4. Records will show in the order they were created when they are not sorted.

## Lesson 5

# User-Centered Design

---

**Time:** This lesson takes approximately 20 minutes to complete.



# Objectives

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**After this lesson, you will be able to:**

- Identify the steps of the design process
- Describe your user's goal as a one-sentence problem statement
- Understand the needs of the fictitious company, Equipment Providers, Inc., used in the rest of the lessons.

User-centered design is an established methodology for product interface design that involves the eventual users of the solution in each stage of the design process. It forces product developers to focus on the user—and to step away from the computer.

The aim of user-centered design is to build solutions that focus on users' goals, not features. By focusing on goals, you will ensure that your solution is solving the right problems, therefore making your users more confident and successful.

# What is User-Centered Design?

We're surrounded by software. We repeatedly check our iPhones for messages. We use self-checkout lines in the supermarket, monitor the GPS systems in our cars, cruise the Netflix queues on our televisions. More and more, we're facing screens—and not computer screens.

Mobile computing has arrived, and it's changed our expectations of software. Today, it's no longer good enough for a software product or application to work—it has to work well. The developers that are making a difference in our world are taking great technologies and shaping them with user-centered design.

## Three Basic Principles

The basic principles of user-centered design are:

1. Observe users – their goals, behaviors, mental models
2. Make technology serve users – not the other way around
3. Test with users – give them a natural goal, then sit back and watch

If you are doing user-centered design correctly, you will be repeating this process over and over again until you identify what really meets the users' expectations.

## Think Goals Not Features

Start by understanding what the user wants to achieve, not the features you *think* the user needs.

Why? Because goals are much more descriptive than features. For example, consider a Porsche and a riding lawnmower. They have the same features including an internal combustion engine, four wheels and rubber tires, a transmission, and a steering wheel. But when described in terms of goals, the lawnmower cuts grass evenly while the driver is seated comfortably. This is a big difference from a Porsche!

## Think Differently

Building a solution begins with the user-centered design process, not with development in FileMaker Pro. By stepping away from the computer, you free yourself to think and act differently during the design process.

You will need some imagination. Do some "whiteboarding" with users, Borrow design patterns from other places, like the Starter Solutions or your favorite apps. And remember, more isn't necessarily better.

You will need some knowledge. A solid understanding of what is possible with the FileMaker Platform will lead to better ideas.

And you will need an "I can do it" attitude. Don't be intimidated by user-centered design. Adopt one, two or a few of these practices and grow from there.

# Basic Principles

## Observe users - their goals, behaviors, mental models

Taking the time to understand your audience and their needs up front is the first step in designing a truly useful and usable solution that your users will love. Put yourself in their shoes and truly immerse yourself in their job roles.

Describe your user's goal as a one-sentence problem statement:

Design a [form of solution]

For [user type]

To [human activity]

With [level of support]

For example, for a hospital, the statement might be:

Design a [kiosk application]

For [urgent care patients]

To [sign in]

With [speed]

Yes, your users will likely have more than one goal. Write down all your users' goals and their problem statements. You may have users with different goals and you will need to prioritize which problems are the most important. However, don't try to solve every problem at once. Solve a simple problem first, then, gradually add complexity.

Sketches, whiteboards, wireframes and flowcharts can be helpful in communicating what you have learned. Allow yourself to be creative and observe your users.

## Make technology serve users - not the other way around

Where will it be used? In an office, in the field, in bright daylight, at night, in a car, near water, etc.?

What posture will the users have during use? Standing, sitting, one-handed, two-handed? How precise will the users be able to be during use?

Will they be using Windows, Mac, iPad, iPhone, or a web browser? If using an iPad or iPhone, which orientation will it be used in most? Landscape, portrait, or both?

The FileMaker Platform gives you many tools to simplify the user experience. But like any tool, it can be used in a million different ways. It is your design choices that will determine if you frustrate users or delight them.

## **Test with users - give them a natural goal, then sit back and watch**

Prototypes may start as flowcharts and whiteboards, but will evolve into something your users can actually use. Developing in FileMaker Pro lends itself well to this step since development is very iterative, allowing you to make changes at any time in the process.

During this time, allow your ideas and solutions to evolve. Ask for feedback from users and have a discussion on what the solution lacks and offers for the users. During this whole process, you may revisit previous steps. The design process involves multiple iterations in order to create a successful solution.

# Equipment Providers, Inc.

Throughout the rest of the FileMaker Training Series: Basics, you will be learning FileMaker by building a solution for a fictitious company, Equipment Providers, Inc.. The company rents office equipment to a number of customers. Now we will start by going through the user-centered design process steps.

## Observe users - their goals, behaviors, mental models

The Equipment Provider Inc. management team has noticed that many assets are not being tracked properly. While employees track data in an Excel spreadsheet, they are not consistent. Occasionally, employees will write asset details on a sticky note and ask the company's administrative assistant to type the data into the spreadsheets, but the notes get lost among other paper or accidentally thrown away.

After reviewing the data, there are numerous spelling and consistency errors in the data. For example, the Asset category column shows mismatched data like "Office Furniture" and "Furn.: Office", making it hard to properly group and sort data.

When it comes to the Customer information, most of the existing information is out of date. Employees depend on their own address books instead of the spreadsheet, which limits access by other employees. Additionally, Customers are required to sign a paper copy of the Asset information to confirm that they received the asset. These paper copies are rarely placed in the filing system in a timely manner—usually 3 to 4 weeks after being signed. In other words, the current spreadsheets in place are either missing data or outdated.

This fictitious example has the following primary one-sentence problem statement:

Design a [customer asset tracking solution]  
For [the operations team]  
To [know which customers have which assets]  
With [speed and accuracy]

In addition, the following elements are relevant:

- Currently the Customer and Asset data is stored in Excel spreadsheets.
- It will be important to know when an asset was purchased, when it was given to the customer, and how much the asset cost.

- When the customer receives the asset, a signature is required. Currently, a form is printed out with asset details and the customer signs the form. However, all employees have an iOS device provided by the company, so the best plan would be to leverage signing out assets from an iPhone or iPad
- Users want the ability to add notes to a given asset. Notes can be anything from details about the asset (color, size, etc.) to damage information when the Customer returned the asset. It would be best if the user could type information into a Notes field.
- It is imperative to know how long a customer has leased each asset.
- It will be important to know the total cost of a Customer's Assets.
- Users, except for the Admin account, should not be able to modify Customer information. All users can edit Asset data.
- Users cannot delete any Customers or Assets.
- Pushing the data to the web would be useful so that Customers can see a list of Assets they have.
- It would be nice to have a report that provides all assets by customer and the total cost per customer.

Based on the relevant points observed about the Equipment Provider Inc. scenario, there may be additional one-sentence problem statements. Here are a few others to consider:

Design an [iPad workflow]

For [a delivery worker]

To [get a customer's signature]

With [security and reliability]

Design a [method of inputting data]

For [an operations team member]

To [take notes about an asset]

With [speed and portability]

Design a [report]

For [an administrative assistant]

To [view assets for customers and their total cost]

With [update to date information]

## **Make technology serve users - not the other way around**

Employees deliver and install equipment onsite. Most of the sites are office buildings. A signature is collected from the customer to verify that the equipment was properly delivered and installed. For these reasons, it would be easier for these employees to access the solution from an iPhone or iPad rather than from a computer.

The employees have a lot of deliveries and installations during the day so they need a solution that requires very little time to view and record information.

As you continue through the training, you will build a solution for Equipment Providers, Inc. while learning about data, user interface, solution logic, reporting, integration, security, and deployment.

## Review Questions

1. What are the three basic principles of user-centered design?
2. What is the template for a one-sentence problem statement?
3. What is the primary one-sentence problem statement for the employees of the fictitious company, Equipment Providers, Inc.?

# Answers

1. First, observe users taking note of their goals, behaviors, and mental modes. Next, make the technology serve users, not the other way around. Lastly, test with users by giving the natural goals, and watch their behaviors.
2. Design a [form of solution]  
For [user type]  
To [human activity]  
With [level of support]
3. Design a customer asset tracking solution  
For Operations  
To know which customers have which assets  
With speed and accuracy

## Lesson 6

# Importing Data

---

**Time:** This lesson takes approximately 20 minutes to complete.

**Lesson File:** Customers.xlsx, Assets.xlsx



# Objectives

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After this lesson, you will be able to:

- Identify common file formats that can be converted by FileMaker Pro 13
- Convert a supported file format into a FileMaker solution
- Convert an Excel workbook with multiple worksheets into a single FileMaker solution

There are three primary methods for creating a solution: beginning with a Starter Solution and modifying it to meet your needs, importing data from another source, and creating a solution from scratch.

In this lesson, we'll begin to build the solution for Equipment Providers, Inc. by importing data from two spreadsheets.

In the **Getting Started Tour** you learned:

- Getting Started > Importing Records
  - You can import data from another FileMaker Pro file or from another application, such as Microsoft Excel.
  - When you import, you can add new records to your database or update data in existing fields.

# Converting an Existing File

FileMaker Pro can import many different file formats. This is useful because the conversion process automatically creates tables, fields, and records, reducing the number of steps required to get started using FileMaker Pro. It also removes the need to manually input information that you already have. File formats that will convert directly into FileMaker files include:

- Microsoft Excel files (.xls or .xlsx)
- Tab-separated text files (.tab or .txt)
- Comma-separated text files (.csv or .txt)
- Merge files (.mer)
- XML files (.xml)
- dBASE files (.dbf)
- Bento files (.bentodb)

Other file types will need to be converted to one of the supported file formats before they can be converted to **.fmp12**. For example, the records from a Microsoft Access database (.mdb) can be exported as Microsoft Excel files. Three of the most common file formats converted into FileMaker files are Excel, comma-separated values, and tab-separated values.

You may need to clean up your spreadsheets to make the transition to FileMaker Pro easier. For example, include a header row (which FileMaker Pro will interpret as field names), remove any blank rows, and remove any subtotal or total rows (since FileMaker Pro allows you to create necessary fields to show summarized data).

# Converting Excel Files

An Excel spreadsheet is one of the files most frequently imported file types.

FileMaker retains Excel data types such as text, numbers, dates, etc. when data is imported. If a column of data in the original spreadsheet is a mix of data types, FileMaker Pro will import that column as text.

In the case of Equipment Providers, Inc., you import two sets of data, Customers and Assets.

Similar to a spreadsheet with multiple worksheets, a FileMaker solution can store different categories of information in tables, such as Customers and Assets.

## Activity 6.1: Importing a spreadsheet to create a new FileMaker file

You will create a FileMaker file called **Equipment Rentals.fmp12** using the spreadsheet data you have. When you bring the data into FileMaker Pro, tables are automatically created and the data is populated into fields.

1. Click and drag the **Customers.xlsx** file over the FileMaker Pro application icon in your computer's toolbar.
2. In the **First Row Option** dialog, select **Field Names** and click **OK**. This tells FileMaker Pro that the first row contains column headers that should be used as field names in the new database.
3. Name the file **Equipment Rentals.fmp12** and save the file on your desktop.
4. Go to **File > Manage > Database...** and go to the **Tables** tab. The import process named the first table the same name as the file. Since the data in this table is customer data, select the Equipment Rentals table, type “**Customers**” in the **Table Name** area, and click **Change**.
5. Click **OK** to exit the **Manage Database** dialog.
6. Your file has been created and FileMaker Pro will show you the data on a Layout named **Layout #2**, shown in **Table** view.

Note: You can also import data files from the **Quick Start Screen** by using the **Convert an Existing File** option.

## Activity 6.2: Importing a spreadsheet into an existing FileMaker File

Your users will also want to view Asset data in this solution. Import the **Assets.xlsx** spreadsheet into the Equipment Rentals file.

1. Choose **File > Import Records > File....** Navigate to the **Assets.xlsx** file and click **Open**. The second set of data must be imported into a new table.
2. Click on the drop-down labeled **Target** on the upper right of the **Import Field Mapping** dialog and choose **New Table ("Assets")**.
3. Check the box for **Don't import first record (contains field names)**. Your screen should look like Figure 25.

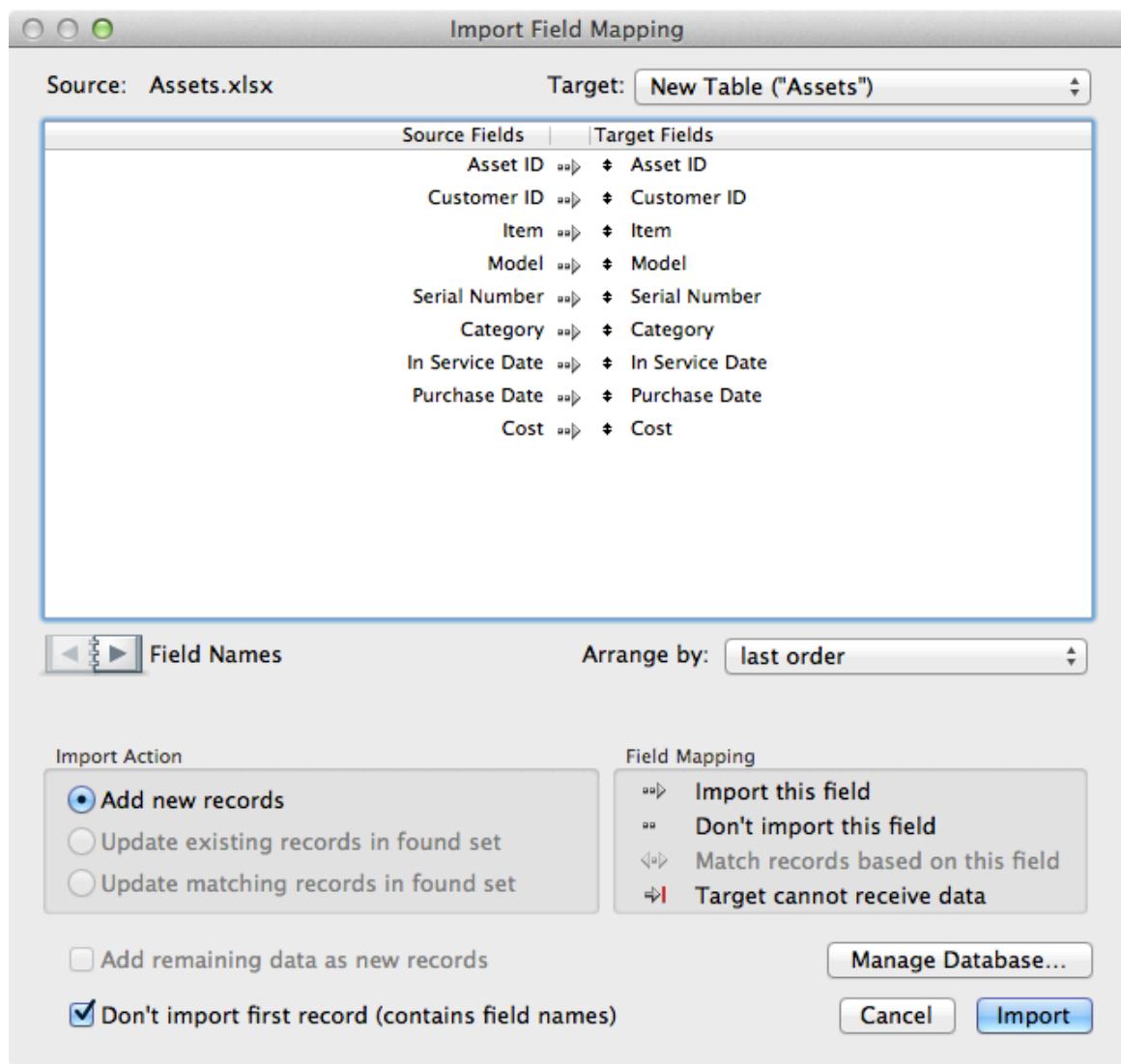


FIGURE 25

4. Click **Import**. After the import, an **Import Summary** window appears showing 29 records imported. Click **OK**.

At this point, two tables of data exist in the Equipment Rentals file.

## Review Questions

1. What are the three primary methods of creating a new solution?
2. List three common file formats that can be converted directly into a FileMaker Pro file.
3. If a file format cannot be converted directly into a FileMaker Pro file, what must you do to get the data into a FileMaker Pro file?

# Answers

1. Solutions are created by either beginning with a Starter Solution, importing data from another source, or creating a solution from scratch.
2. Three of the most common file formats converted into FileMaker files are Excel, comma-separated values, and tab-separated values. FileMaker Pro also supports the conversion of dBASE, merge, Bento, and XML files.
3. File formats not directly supported by FileMaker Pro have to first be converted into a supported format. It may be necessary to request that the data be supplied in a supported format.

## Lesson 7

# Creating Fields and Tables

---

**Time:** This lesson takes approximately 20 minutes to complete.

**Files:** Equipment Rentals.fmp12



# Objectives

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After this lesson, you will be able to:

- Create tables from the Manage Database Dialog
- Create fields from the Field Picker in Layout mode
- Create fields from the Manage Database Dialog

In this lesson, you will learn how to create fields from the Field Picker. You will also learn how to create fields from the Manage Database Dialog. FileMaker Pro gives you these different options to make it quick and easy to add fields while you create your solution.

In the **Getting Started Tour** in FileMaker Pro, you learned how to add existing fields to your layout from the Field Picker.

- Creating Solutions > Tables
  - Databases contain tables that represent categories of data, such as Assets or People.
  - Tables are made up of fields that store data in these categories.

# Create New Tables

As you expand your solution, you will add more tables and fields to your database. There may be additional data, that didn't previously exist, that you want to store in the FileMaker file.

To review and define tables, fields, and relationships in your solution, you can use the **Manage Database** dialog, shown in Figure 26. You can access it by choosing **File > Manage > Database....** You can also use the keyboard shortcut **Command-Shift-D** (OS X) or **Ctrl-Shift-D** (Windows).

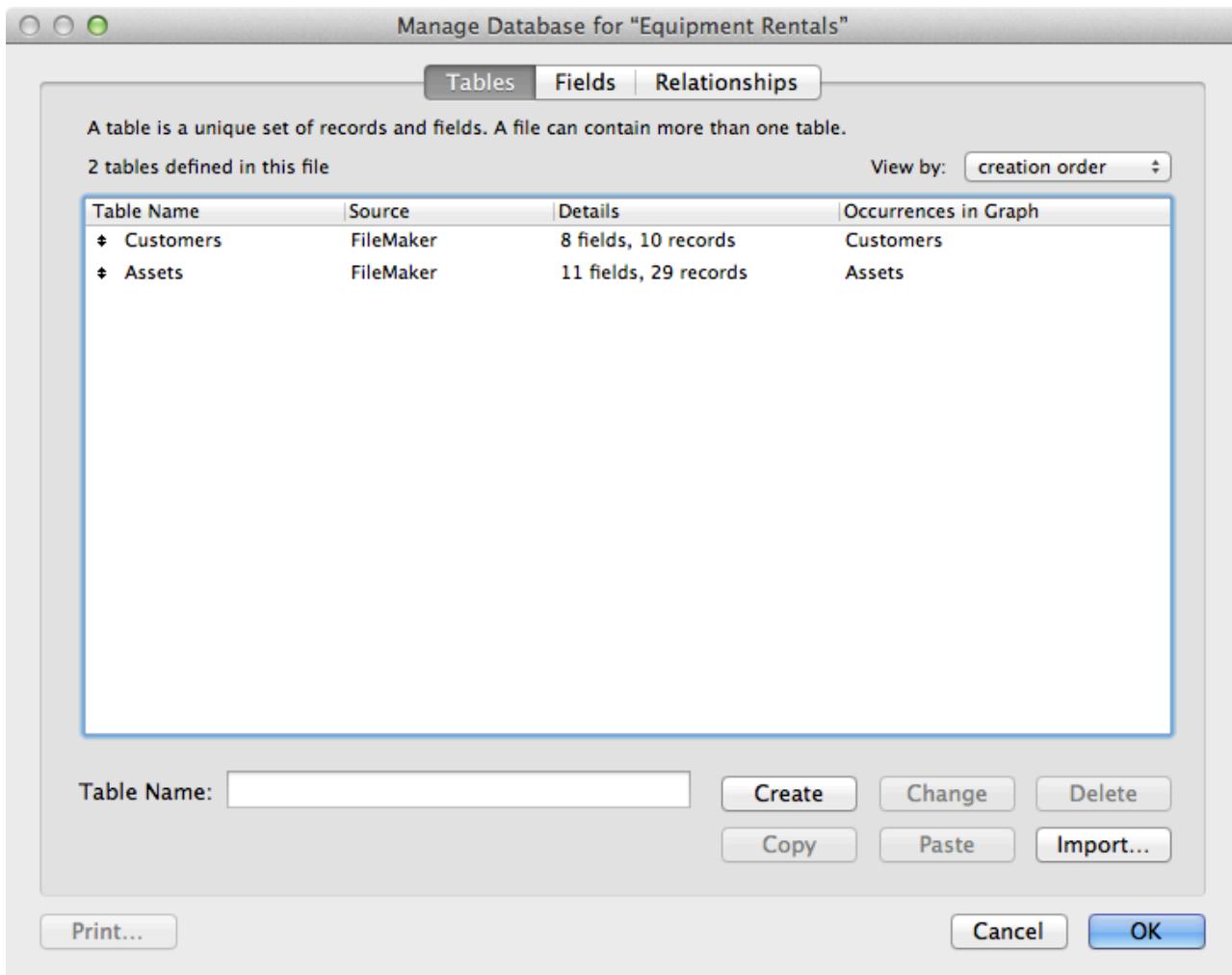


FIGURE 26

As you can see in Figure 26, the two sets of data that we imported into FileMaker Pro from spreadsheets are represented by tables.

You can create new tables for additional data on the **Tables** tab simply by typing the name of the new table in the **Table Name** area and clicking on the **Create** button. Once the table is created, you can begin to add fields.

When naming tables or fields, it is advised that you use only alphanumeric characters (or underscores). If you try to use other characters, you may see the dialog shown in Figure 27.



FIGURE 27

# Field Types

With FileMaker Pro, you can create six types of fields to store data: **text**, **number**, **date**, **time**, **timestamp**, and **container**. Two other field types, **calculation** and **summary**, are used to automate and aggregate data.

## Choosing Field Types

Each field in a FileMaker file must have a specific data type. Choosing an appropriate data type for a field allows FileMaker Pro to decide how best to store and retrieve that data. Although FileMaker Pro is flexible about the kind of data that can be stored in fields of specific types, it is best to choose appropriate field types based on your file design. For example, field type affects the sort order. FileMaker Pro applies different rules for sorting text, number, and date fields.

The list below provides an overview of FileMaker field types.

### Field Type: Text

---

Data Type: Any data that can be stored as text and does not need more specific handling. Numbers or dates can be stored, but in a Text field, they are addressed as plain text, for example in a text field numbers sort as 1, 10, 2, instead of in numerical order as 1, 2, 10).

Notes: Can store approximately 2 GB of Unicode values

### Field Type: Number

---

Data Type: Any data that need to be treated as a number, such as data that must be sorted in numerical order or used in a mathematical calculation.

Text strings are displayed but ignored in most database operations; if you need to enter mixed data, use a text field instead.

Notes: Can store 400 digits to either side of the decimal point

## **Field Type: Date**

---

Data Type: Any date between 1/1/0001 and 12/31/4000 (assuming m/d/y date formatting).

If you enter a date in an unacceptable format, an error dialog results.

Notes: Dates are interpreted as the number of days elapsed from 1/1/0001

## **Field Type: Time**

---

Data Type: Either a duration or a specific time of day (in a 24-hour period).

If you enter non-numeric data into a time field, an error dialog results.

Notes: Times are interpreted as the number of seconds from midnight

## **Field Type: Timestamp**

---

Data Type: A combination of date and time, separated by a space.

Timestamp fields have the same date-range restrictions as date fields.

Notes: Timestamps are interpreted as the number of seconds since midnight on 1/1/0001

## **Field Type: Container**

---

Data Type: Any type of binary data (data that cannot be meaningfully represented as text). Can include images, signatures, PDFs, video or audio files, QuickTime files, or binary files of any type.

Notes: Can store approximately 4 GB of binary data

# **Fields Used to Automate and Aggregate Data**

There are two field types that derive their value by referencing data in other fields:

## **Field Type: Calculation**

---

Data Type: Stores or continuously reevaluates any data based on a formula.

For example, if a record has a Quantity field and a Unit Price field, a calculation field called Line Total can calculate the total by multiplying quantity by unit price.

## **Field Type: Summary**

---

Data Type: A field type that aggregates values (total for a group, average for a group) across a found set of records, and possibly for each subgroup within a sorted found set.

# Create New Fields from the Field Picker

The **Field Picker** is a new feature in FileMaker Pro 13 and FileMaker Pro 13 Advanced. While in **Layout** mode, the **Field Picker** provides a nice visual display of all your existing fields in an inspector-like interface right next to your layout. To add fields to your layout, simply select, drag and drop a field onto your layout in the desired location. You can also use the **Field Picker** to create new fields and drag them directly onto your layout.

Let's create a new field within our solution. Remember that Equipment Providers Inc. wanted to provide a way for customers to sign a form verifying that Equipment was delivered?

For the Equipment Rentals file, you will need to add a container field so that customers can add their signature when they receive equipment.

Container fields in FileMaker solutions can store and enable interaction with these types of files:

- Images
- Video or audio files
- QuickTime files—movie, sound, or other QuickTime-capable files
- Files of any type—Word, Excel, PDF, and more

## Activity 7.1: Creating a New Container Field from the Field Picker

In the Equipment Rentals file, users need to gather customers signatures when an asset is delivered. Use the **Field Picker** to create a signature field for the Asset table.

1. Navigate to the **Assets** layout and enter **Layout** mode.
2. Click the **Field Picker** button in the status toolbar to display the **Field Picker**, shown in Figure 28.

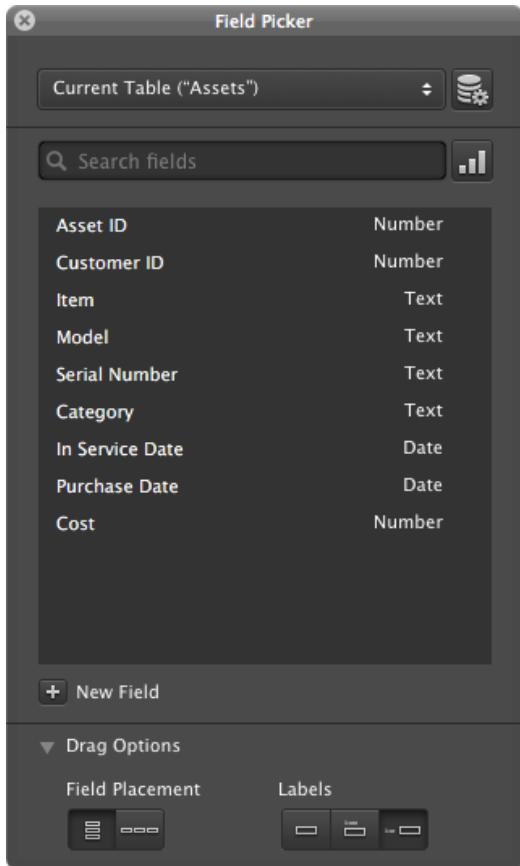


FIGURE 28

3. Click the **+** icon labeled **New Field**.
4. Type "**Signature**" as the field name and select **Container** as the field type. You have now successfully created a **Container** field to store Customer signatures.
5. Drag the new **Signature** field out onto the layout and place it on the right side of the layout, and click out of the **Field Picker**.

# Create New Fields from the Manage Database Dialog

Creating fields in the **Field Picker** is incredibly easy, but when many changes are needed across multiple tables, it can be quicker to do the work in the **Manage Database** Dialog.

## Activity 7.2: Creating a New Text Field from the Manage Database Dialog

For the Equipment Rentals file, it will be helpful to have a notes field so that employees can add notes when they deliver and pickup equipment. Create a notes field within the Manage Database dialog.

1. In the **Manage Database** dialog, click on the **Fields** tab.
2. Choose **Assets** from the **Table** drop-down.
3. Type **Notes** in the Field Name area.
4. Choose **Text** in the **Type** drop-down and click **Create**.
5. Click **OK** to close the **Manage Database** dialog.

## Review Questions

1. Name 4 different types of fields you can create in FileMaker Pro.
2. What types of information can be stored in Container fields?
3. If you are editing a layout, what is the easiest way to create a new field?
4. If you are in the Manage Database dialog, how do you create a new field?

# Answers

1. Text, numbers, date, time, timestamp, container, calculation, summary are the field types you can create in FileMaker Pro.
2. Container fields store binary data like images, signatures, PDFs, video or audio files, QuickTime files, or other files.
3. The **Field Picker** is the easiest way to create a new field while editing a layout.
4. While on the **Fields** tab, type the name of the new field in the **Field Name** box, select a field type, and click **Create**.

## Lesson 8

# Relationships

---

**Time:** This lesson takes approximately 20 minutes to complete.

**Lesson File:** Equipment Rentals.fmp12



# Objectives

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After this lesson, you will be able to:

- Understand one-to-many and many-to-many relationships
- Understand the usage of primary and foreign keys
- Create relationships between tables
- Understand table occurrences

FileMaker is a relational database management system, which provides a way to relate two or more sets of data in order to reduce double data entry and help improve the consistency in your data.

The **Getting Started Tour** in FileMaker Pro introduced the basic concept of relationships. In this lesson, you will learn about the different types of relationships and what is needed to create a relationship.

Here is what you learned from the **Getting Started Tour**.

- Creating Solutions > Relationships
  - Relationships connect data stored in different tables in a database.
  - You can enter data once, then view and use that data in related tables or files.
  - A portal is a layout object that displays data from related tables.

# Relationships

## Relationships Types

Now that you have learned how to create tables and fields, you can now link together related information from those different tables. A relational database reduces the need to enter the same data multiple times or in multiple places.

For example, in the **Equipment Rentals** file, customer information is stored once in the Customer table. When an Asset is linked to a Customer, the user can view the related information from the Customer record. This saves the user from having to enter that Customer information again. Also if the user updates the customer's contact information, the new information will be available for all Assets.

The most common relationship types in a relational database are one-to-many and many-to-many.

### One-to-many

This is the most common type of relationship. Consider the **Equipment Rentals** solution:

- Each Customer may potentially have many Assets.
- Each Asset is associated with only one Customer.

The relationship between Customers and Assets is a one-to-many relationship.

When identifying the relationships between entities, there are some notations that are commonly used. As shown in Figure 29, a line is used to connect boxes representing the two entities, with a crow's foot at the end that represents the "many" side of the relationship.

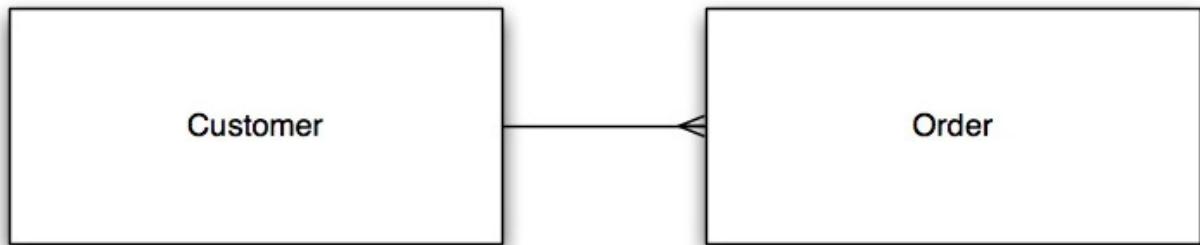
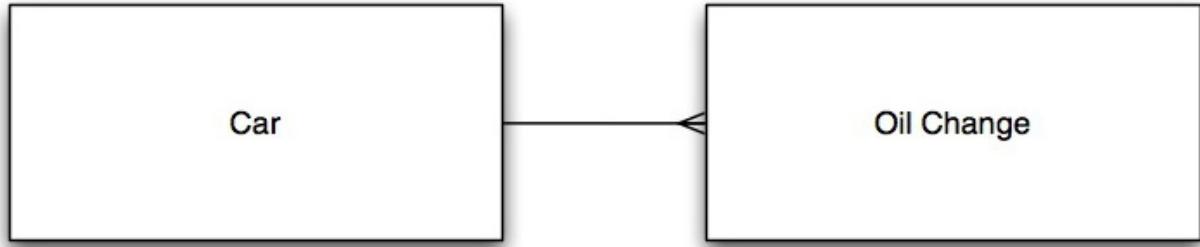


FIGURE 29

These relationships can be described as follows:

- One car may have many oil changes over time; each oil change is performed on one car.
- One customer may place many orders over time; each order is placed by a single customer.

## Many-to-many relationships

Now consider a solution that tracks movies and actors. What is the relationship between actors and movies?

- One actor may act in many movies over time.
- One movie has roles for many actors.

In this case, the relationship is many-to-many, as shown in Figure 30.

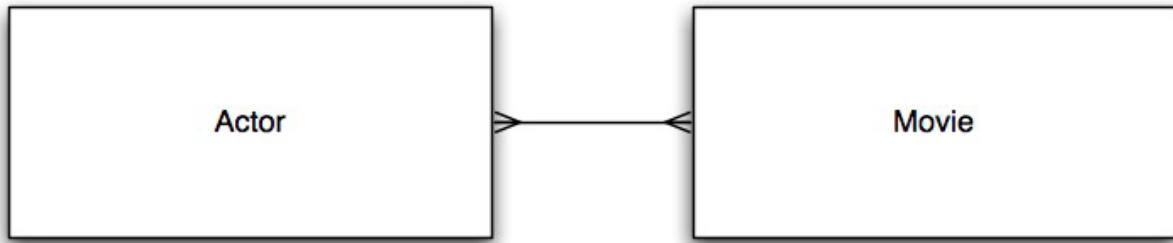


FIGURE 30

## Identifying Relationship Types

Whether a relationship is one-to-many or many-to-many is not always obvious. The correct answer may depend on the specifics of the situation you are trying to capture. Suppose you have a solution that tracks paintings and artists. You may assume that the relationship between artist and painting is one-to-many:

- One artist may paint many paintings.
- Each painting is painted by only one artist.

The first point seems obvious. What about the second? If the solution tracks projects like community murals, the second point may not be correct—many artists could contribute to one painting. If you are tracking class paintings, then you may need to think about paintings started by a teacher and finished by his or her student. The relationship may be better modeled as many-to-many.

# Using Primary and Foreign Keys to Relate Tables

When relating tables, it is important to uniquely identify each record. By having a unique identifier, you will be able to create relationships between tables. Also, it is useful to be able to reference any given record by a unique identifier when troubleshooting a database.

For example, invoices from service providers have an Invoice Number and this is often the unique identifier. This provides both the customer and the service provider with a way to easily reference the same invoice.

## Primary Keys

---

The unique identifier in FileMaker is called a primary key. It is recommended that you create a primary key in every table in order to uniquely identify any record. A primary key should follow these rules:

- be unique for every record in the table
- never changes
- never be empty

It is good practice to allow FileMaker Pro to create the primary key values automatically, ensuring that the three rules above are followed. Note that the data you imported into the Customers and Assets tables already contained primary keys: **Customer ID** and **Asset ID**, respectively. The primary key values were manually entered in the spreadsheet but FileMaker Pro can automatically assign these values for future Customers and Assets.

## Activity 8.1: Adding an Auto-Enter Field Option to Primary Keys

You will modify the existing primary key fields to auto-enter a serial number for future new records.

1. Open the **Manage Database** dialog and click on the **Fields** tab. Make sure the **Customers** table is selected.
2. Double click on the **Customer ID** field to bring up the **Field Options** dialog.

3. On the **Auto-Enter** tab, activate the **Serial number** option (by entering a checkmark in the checkbox next to **Serial number**) as well as **Prohibit modification of value during data entry** (at the very bottom) to prevent users from modifying the primary key.
4. Our largest Customer ID is currently 112 for Williams Design Studio. Change the **next value** to 113, as shown in Figure 31 to make sure the values in this field are always unique. Click **OK**.

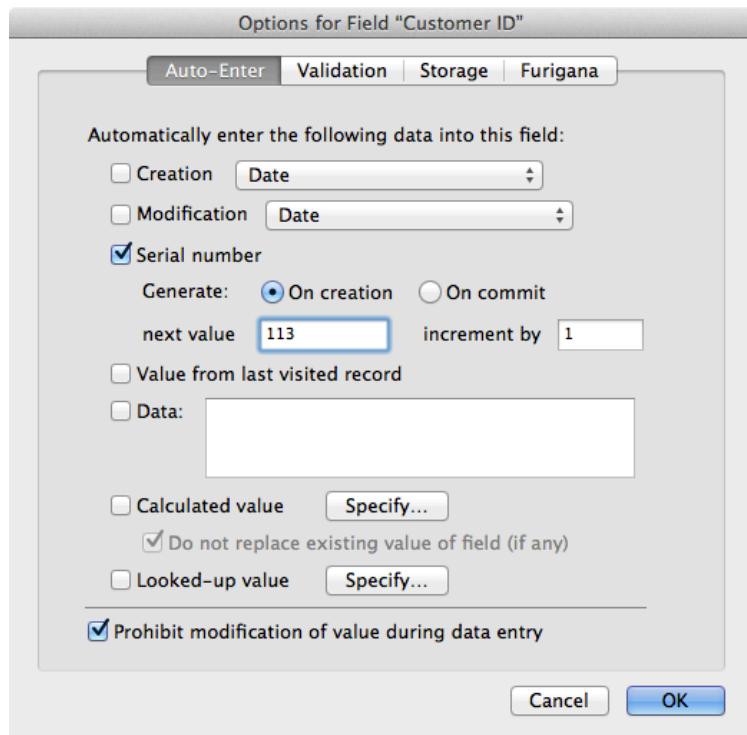


FIGURE 31

5. Change the list of fields to the **Assets** table.
6. Double click on the **Asset ID** field. Repeat step 3 and 4 above, but change the **next value** to 1984.

## Foreign Keys

While a primary key is an attribute that allows you to uniquely identify a Customer, how can it be used to link a Customer to one or more Assets? For the relationship to work, a field must be created in the Asset table. You can assign a Customer to an Asset by entering the primary key value from the Customer record into an Asset record, providing a link between the two tables. The name of this type of field is a foreign key.

When thinking about a one-to-many relationship, the "many" side will always contain the foreign key. In the **Equipment Rentals** file, the **Asset** table requires a customer foreign key.

The foreign key, **Customer ID** has already been created in the **Asset** table.

# Creating Relationships

The **Relationships** tab of the **Manage Database** dialog contains the **Relationships Graph**. It provides a way to graphically represent and specify relationships among the tables in your database.

Each box on the graph is called a table occurrence (TO). Think of a TO as an alias or shortcut to a table. To check the source table for a TO, hover your mouse over the small arrow left of the name of the TO, as shown in Figure 32. Because you can create multiple TOs based on the same table, you can create many different relationships between any two tables.

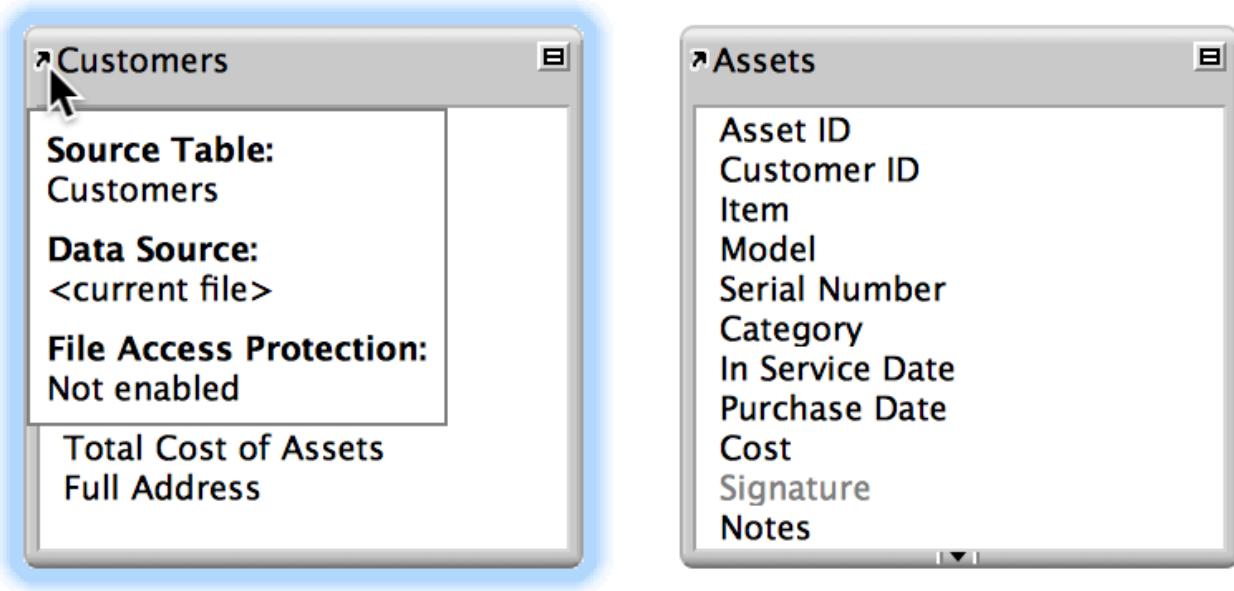


FIGURE 32

## Creating Relationships

With primary keys and foreign keys created in the Equipment Rentals file, the database is properly setup to create relationships between tables.

### Activity 8.2: Creating a Relationship

You will set up a relationship between the Customers and Assets tables.

1. Navigate to the **Relationships** tab of the **Manage Database** dialog.
2. Click and drag from the **Customer ID** field in Customers to the **Customer ID** field in Assets. Your relationships graph will look like Figure 33.

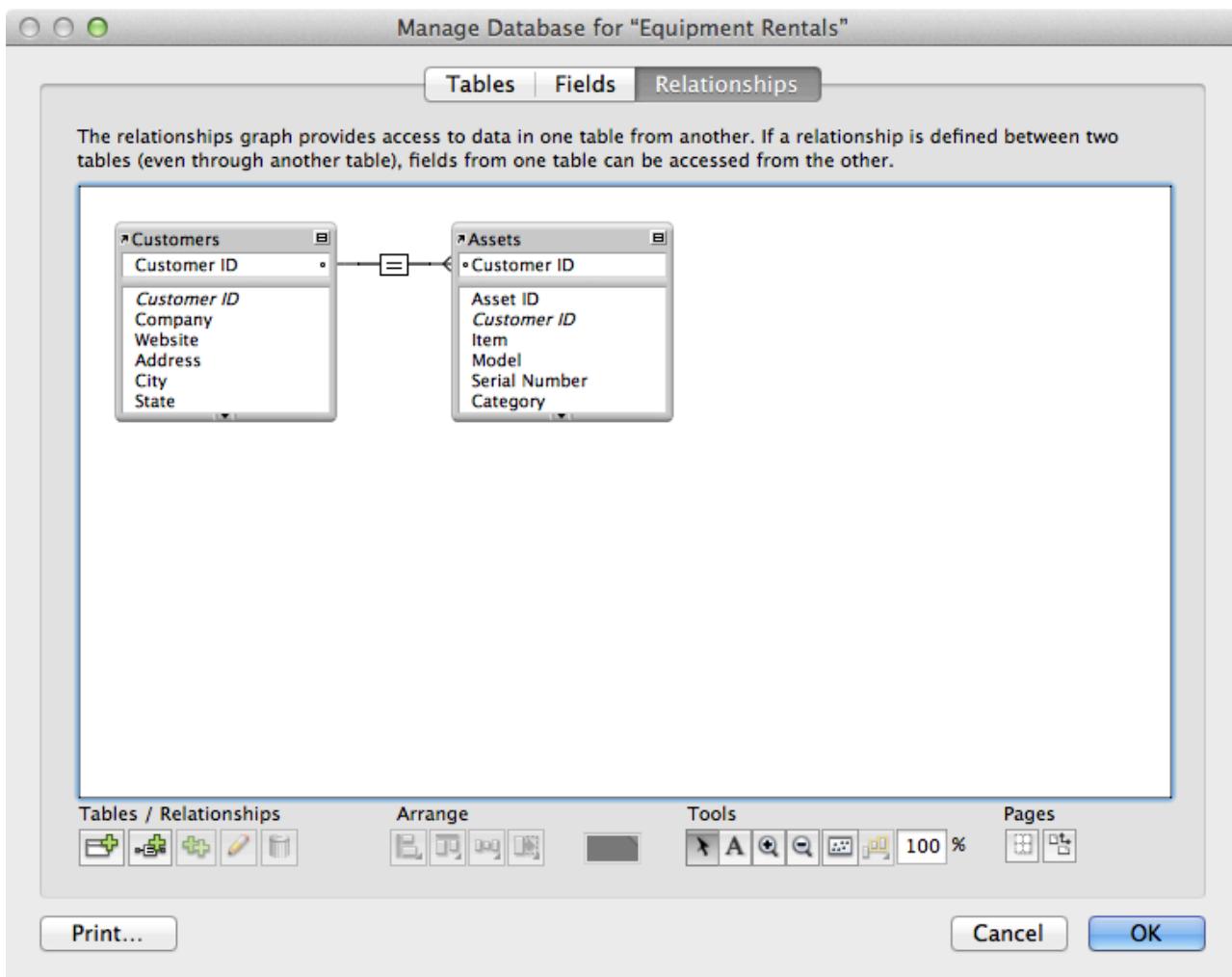


FIGURE 33

3. Click **OK** to close the **Manage Database** dialog.

A relationship has now been created between the primary key in the Customers table and the corresponding foreign key in the Assets table. This will allow you to associate any number of Assets with a given Customer.

# Review Questions

1. What are the two most common types of relationships?
2. What is the relationship between the following:
  - Actors and Movies
  - Songs and Concerts
  - Aircrafts and Inspections
  - Race and Swimmer
3. What field should you create in every table of your FileMaker solution?

# Answers

1. One-to-many and many-to-many are the most common relationships.
2. The relationships are:
  - Many-to-many
  - Many-to-many
  - One-to-many
  - Many-to-many
3. You should always add a primary key field to every table.

# Lesson 9

## Layouts

---

**Time:** This lesson takes approximately 20 minutes to complete.

**File:** Equipment Rentals.fmp12



# Objectives

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**After this lesson, you will be able to:**

- Create layouts for specific devices
- Add fields to layouts
- Apply styles and themes to layouts

Layouts provide the canvas for creating your user interface. Whether you will present forms, lists, reports, charts, or complex workflows, layouts are the way to present information and actions for your users.

A layout consists of:

- A layout area
- Objects: Fields, Web Viewer, Tab Controls, etc.
- A Theme and Styles

Here is what you learned from the **Getting Started Tour**.

- Creating Solutions > Themes & Styles
  - Themes provide coordinated colors, fonts, and other styling for layouts.
  - Some themes are specially designed for iOS devices.

# Creating Layouts

A layout organizes how you see information in a FileMaker solution. Whether you're entering data or printing reports, the layout handles how the data is displayed. Layouts do not store data. You can create many layouts to see the same record—or set of records—in different ways.

Each layout is tied to a table occurrence, which is considered the layout's "context". Each layout is associated with one table occurrence on the relationships graph.

In order to create, view, and modify layouts, you need to be in **Layout** mode. In addition to the standard ways of switching modes—the **View** menu and the pop-up menu in the bottom left of the document window—FileMaker also has an **Edit Layout** button at the bottom right of the Status Toolbar when viewing a layout in **Form** or **List** view, shown in Figure 34.

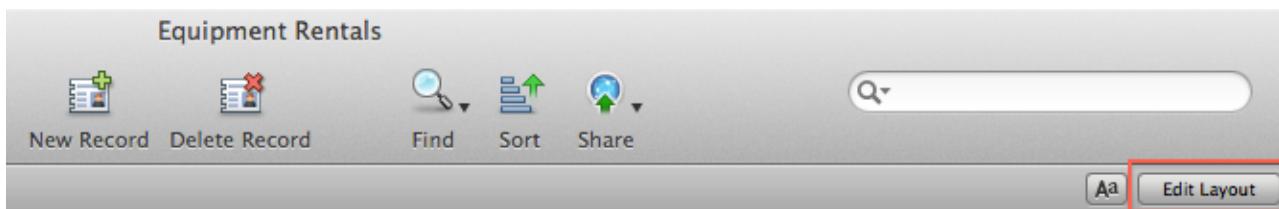


FIGURE 34

## Activity 9.1: Creating a New Layout

You will create a layout in **Equipment Rental.fmp12** to display data from the Customers table for use with FileMaker Pro on a desktop or laptop computer.

1. Choose **View > Layout Mode**, or use the keyboard shortcut **Command-L** (OS X) or **Ctrl-L** (Windows) to enter **Layout** mode.
2. Choose **Layout > New Layout/Report**, or click the **New Layout/Report** button in the **Status Toolbar**, or use the keyboard shortcut **Command-N** (OS X) or **Ctrl-N** (Windows).
3. Choose **Customers** on the **Show records from:** drop-down list.
4. Change the layout name to "**Customer Details**".
5. Click on **Computer** since this layout will be viewed using FileMaker Pro on a desktop computer.

6. Choose **Form** so that the layout will show one record at a time, shown in Figure 35. Click **Finish**.

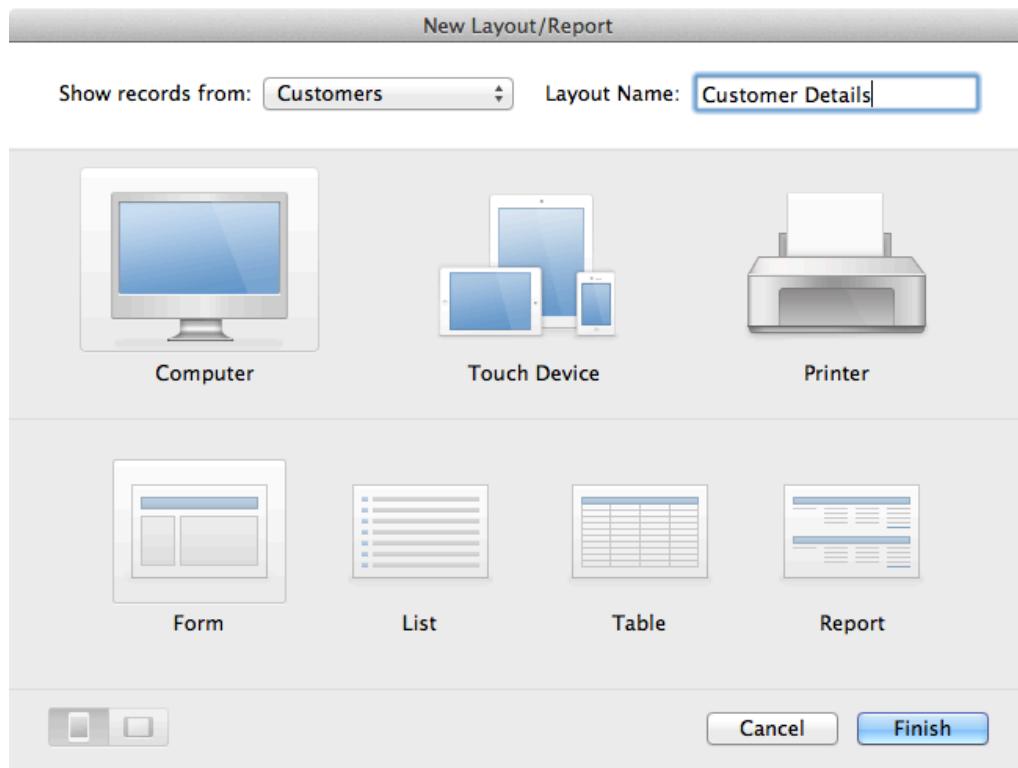


FIGURE 35

## Layout Parts

FileMaker layouts are divided into layout parts. The three most used parts are the header, body and footer. These different sections of the layout control how and where data, text, and graphics are displayed. For example, text placed in a header part prints at the top of each page, while text placed in the body part appears once for each record.

When you create a new layout, it automatically has one or more parts depending on the choices you made in the **New Layout/Report** dialog. Each layout must have at least one part. In **Layout** mode, a gray horizontal line marks the division between layout parts. You can resize a part by dragging the line up or down. You will learn more about Layout Parts in the Lesson 16: Reporting.

# Adding Fields to a Layout

When you create a new layout by clicking on **New Layout/Report**, the layout will not have any fields, which means no data will be visible. Depending on the needs of your users and how they plan on using the current layout, it may contain as few or as many fields as is necessary.

## Activity 9.2: Adding Fields to a Layout Using the Field Picker

Equipment Providers, Inc. needs a layout that will include all of the customer information. You will use the **Field Picker** to add fields to the **Customer Details** layout.

1. Click the **Field Picker** button in the **Status Toolbar**, or use the keyboard shortcut **Command-K** (OS X) or **Ctrl-K** (Windows). The **Field Picker** will appear, shown in Figure 36.



FIGURE 36

2. Click on the **Customer ID** field. Hold down the **Shift** key and click on the last field, **Phone**. All fields will now be highlighted.
3. Drag the selected fields to the layout. This will add the fields along with a field label, based on the field name, as shown in Figure 37.
4. Click out of the **Field Picker**, save your layout, enter **Browse** mode, and flip through a few records.

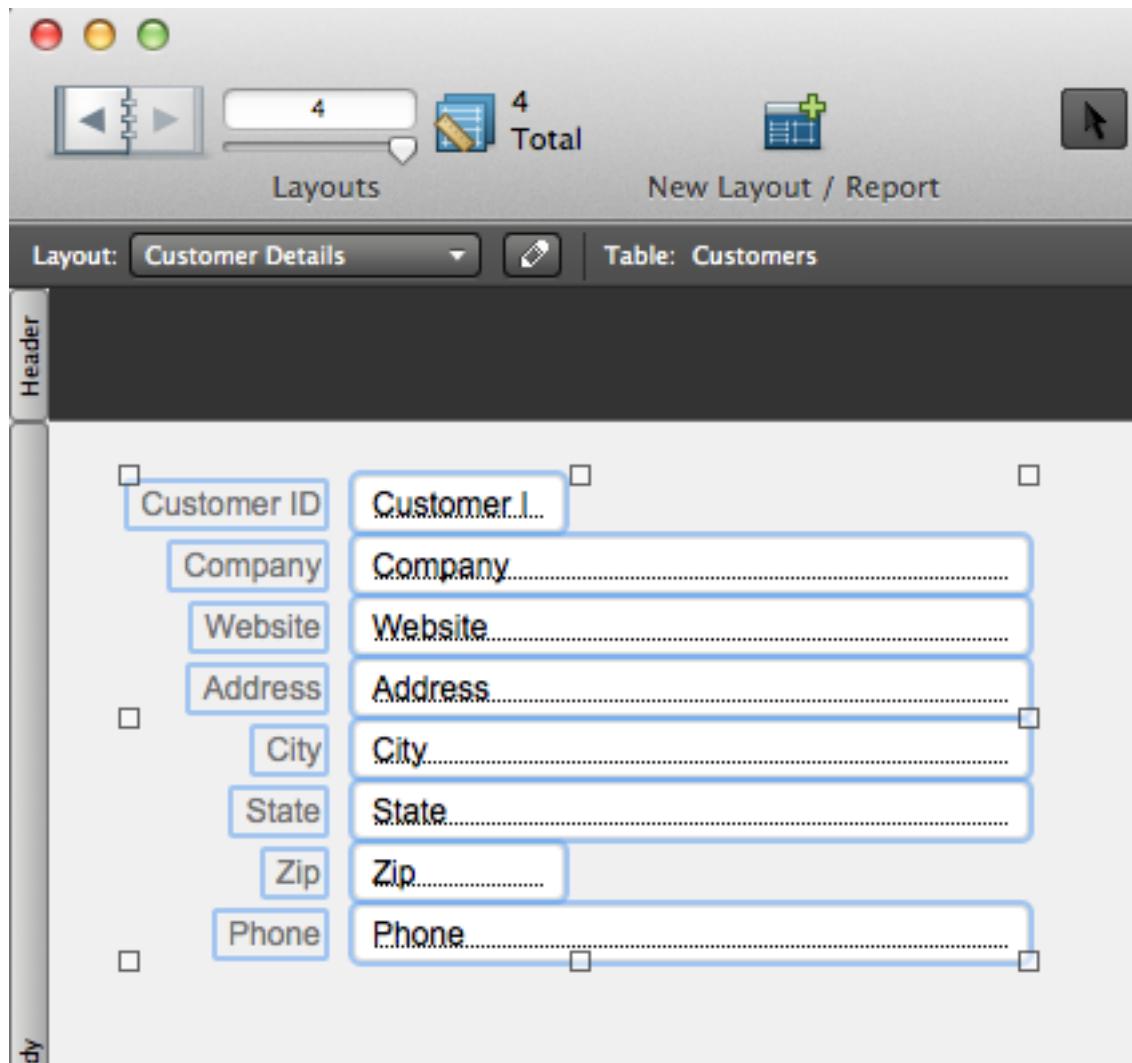


FIGURE 37

## Selecting Fields from Field Picker

If you want to select multiple fields that are grouped together in the **Field Picker**:

- Click on the first field
- Hold down the **Shift** key
- Click on the last field

If you want to select multiple fields that are not grouped together:

- Hold down the **Command** (OS X) or **Control** (Windows) key
- Click on each field

# Layout Themes and Styles

## Themes

Themes help create a visually attractive user interface by providing consistent styles for buttons, fields, background, and other objects on a layout. Themes apply predefined fonts, sizes, colors, padding, and other styling to your layout objects.

When you select a new theme for a layout, all existing layout objects adopt the new theme styles. Object positions, however, remain fixed, so it may be necessary to adjust some of the objects manually depending on the theme selected. It is recommended that you experiment with several themes before you choose one.

Note: A theme called **Enlightened** is the default theme for any new file you create or a file that has been created from an Excel spreadsheet.

## Activity 9.3: Changing the Theme

You will choose a theme that will be used throughout all the layouts for the Equipment Rentals file.

1. From the **Customer Details** layout, enter **Layout** mode.
2. Choose **Layouts > Change Theme...** or use the **Change Theme**  button in the layout bar. A popup will appear showing you all the themes available, shown in Figure 38.

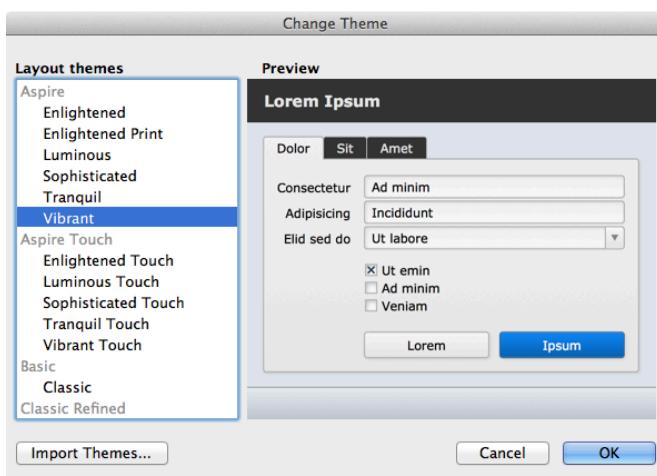


FIGURE 38

3. Select the **Vibrant** theme and click **OK**.

All objects on the layout will change to the defaults of the **Vibrant** theme.

FileMaker also contains a set of themes with the suffix “**Touch**”. These themes are specifically designed for layouts built for iOS devices. Each of these themes use recommendations from Apple’s [iOS Human Interface Guidelines](#) by making fonts larger and buttons bigger for easier use on iOS devices. When developing a solution for iOS, it is recommended that you use a **Touch** theme.

## Styles

Each theme comes with a set of styles for each object type. Styles allow you to easily define and apply consistent formatting to objects on a single layout or across all layouts. All formatting options found in the **Inspector** can be used when defining a style. You can even use an image for the background of an object and save that as part of the style.

Styles are part of the overall layout theme. Within a theme, each type of layout object may have many available styles. Each object on a layout is assigned to a style. Upon assigning a style to an object, it is formatted according to the style.

You can edit existing styles as well as create new styles. Changes to existing styles can be applied to all objects with that style on the current layout or to all objects with that style on every layout that uses the same layout theme.

Utilizing consistent themes and styles throughout your solution can make updating the look and feel of your solution quick and easy. You can access styles by going to the **Styles** tab on the **Inspector** while in **Layout** mode, as shown in Figure 39.

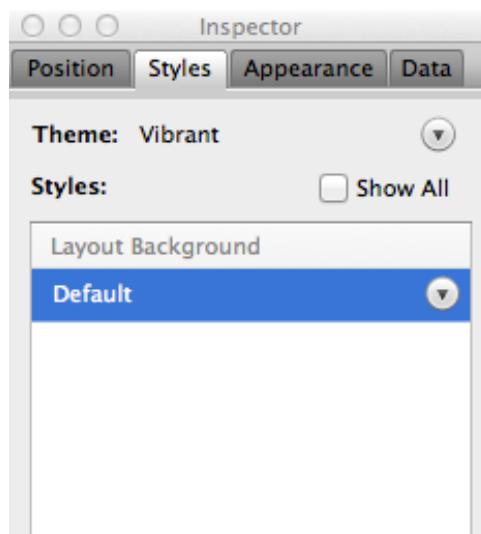


FIGURE 39

# Creating More Layouts

It is common to have different views of the same data. For example, while the Customer Detail is helpful in the Equipment Rentals file, the solution can benefit from having a Customer List. With the **Customer List (List view)**, a user can scroll and see essential data about multiple Customers at once. With **Customer Details (Form view)**, the user can see each customer's full details one at a time.

## Activity 9.4: Creating a List View Layout

1. Enter **Layout** mode and create a new layout.
2. Base the layout on the **Customers** table and call it **Customer List**.
3. Select **Computer** and **List**, then click **Finish**.
4. Click the **Change Theme**  button, select the **Vibrant** theme and click **OK**.
5. Open the **Field Picker** and change the **Drag Options** to place fields horizontally with labels above the field like Figure 40.

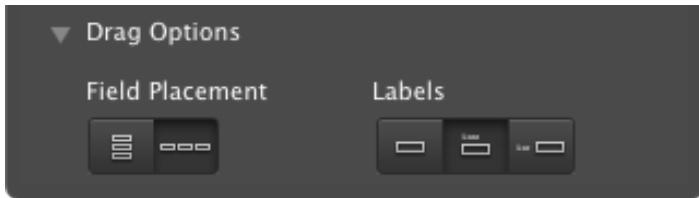


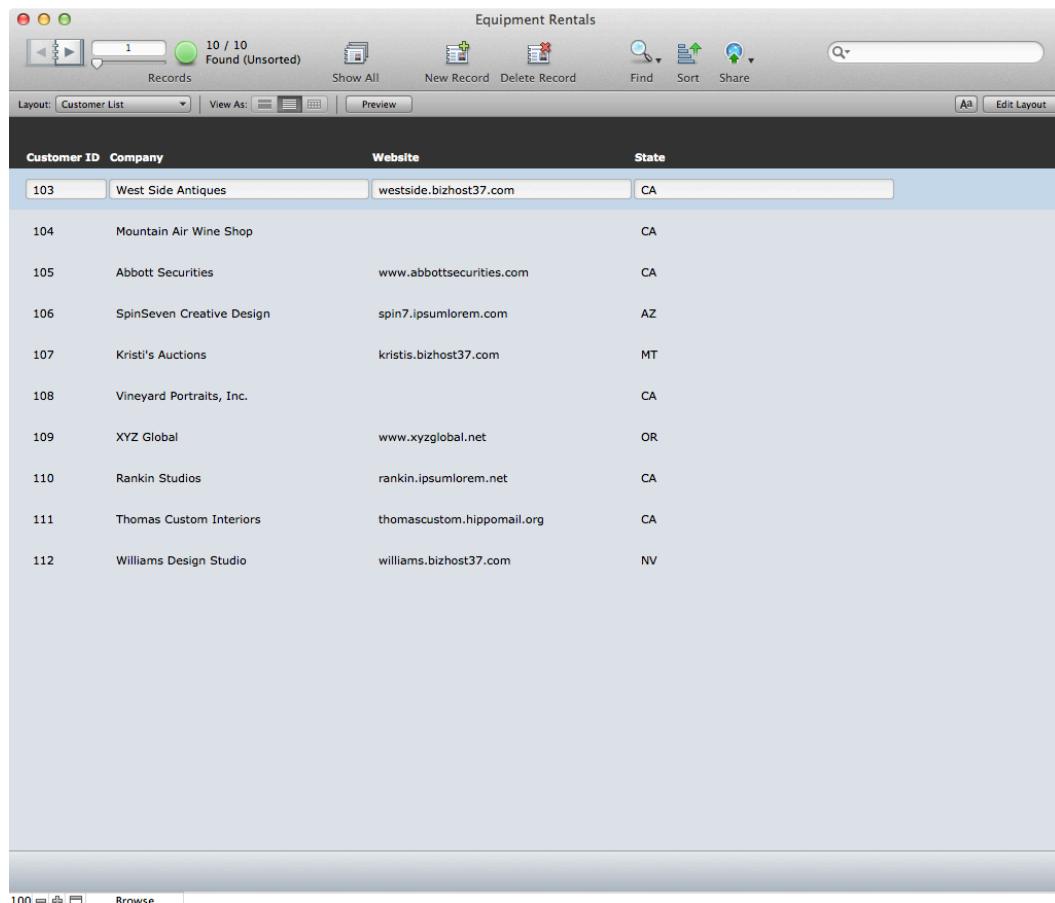
FIGURE 40

6. Add the following fields to the layout with the **Field Picker**:

- Customer ID
- Company
- Website
- State

You can select multiple fields by holding **Command** (OS X) or **Control** (Windows) while clicking. Place the objects on the layout so that the labels are in the Header and the fields are in the Body.

7. Select the labels and change the font color to white by clicking on **View > Formatting Bar** or by clicking the  button in the layout bar.
8. Go to **Browse mode (View > Browse Mode)** and your layout should look like Figure 41.



Customer ID	Company	Website	State
103	West Side Antiques	westside.bizhost37.com	CA
104	Mountain Air Wine Shop		CA
105	Abbott Securities	www.abbottsecurities.com	CA
106	SpinSeven Creative Design	spin7.ipsumlorem.com	AZ
107	Kristi's Auctions	kristis.bizhost37.com	MT
108	Vineyard Portraits, Inc.		CA
109	XYZ Global	www.xyzglobal.net	OR
110	Rankin Studios	rankin.ipsumlorem.net	CA
111	Thomas Custom Interiors	thomascustom.hippomail.org	CA
112	Williams Design Studio	williams.bizhost37.com	NV

FIGURE 41

With the two Customer layouts you created, **Customer List** and **Customer Detail**, users will be able to see a little bit of data about multiple customers or a lot of data about one specific customer.

# Review Questions

1. In which mode can you create layouts?
2. What are the device options when creating a new layout?
3. What tool allows you to quickly add multiple fields to a layout?
4. Which themes are better suited for iOS devices?

# Answers

1. All layouts are created in **Layout Mode**.
2. Computer, touch, and printer.
3. **The Field Picker**.
4. Any theme with the suffix “**Touch**”.

## Lesson 10

# Layout Design Tools

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**Time:** This lesson takes approximately 20 minutes to complete.

**File:** Equipment Rentals.fmp12



# Objectives

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**After this lesson, you will be able to:**

- Style objects with the Inspector
- Select, move, and resize objects
- Turn on Grids and Guides
- Create layouts built and sized for iOS devices

Once layouts are created, the next step is to place objects on the layout and style them appropriately. It is important to make interfaces that are consistent and simple for users to understand. Grids, Guides and Stencils are some of the tools available in FileMaker Pro to aid developers in creating the best experience possible for their users.

Here is what you learned from the **Getting Started Tour**.

- Creating Solutions > Layout Objects
  - Layout objects are elements placed on a layout. They enable users to view and interact with data.
  - You can select, move, resize, delete, copy, format, name and change objects.
- Creating Solutions > Layouts
  - FileMaker Pro includes tools to create beautiful layouts for easy data entry and analysis.
  - You can customize layouts by editing objects, positioning and arranging them, resizing them, and making other changes to their appearance.

# Status Toolbar and Inspector

In **Layout** mode, the **Status Toolbar** provides quick and easy access to many of the tools you use while working with layouts. These tools, shown in Figure 42, allow you to create new layout objects and apply colors and styles to existing objects.



FIGURE 42

The bottom row of the **Status Toolbar** is called the **Formatting Bar**. If it is not displayed, you can activate it by clicking on **View > Formatting Bar** or by clicking the  button in the layout bar.

There are standard text and drawing tools that you may find familiar. For example, to add a box to a layout, click the **Rectangle** tool, then click and drag to draw the box on the layout.

## Inspector

The **Inspector** is the object control center where you can view and modify the settings for all objects on a layout. Each of the four panes of the Inspector—**Position**, **Styles**, **Appearance**, and **Data**—focuses on a different aspect of formatting (Figure 43).

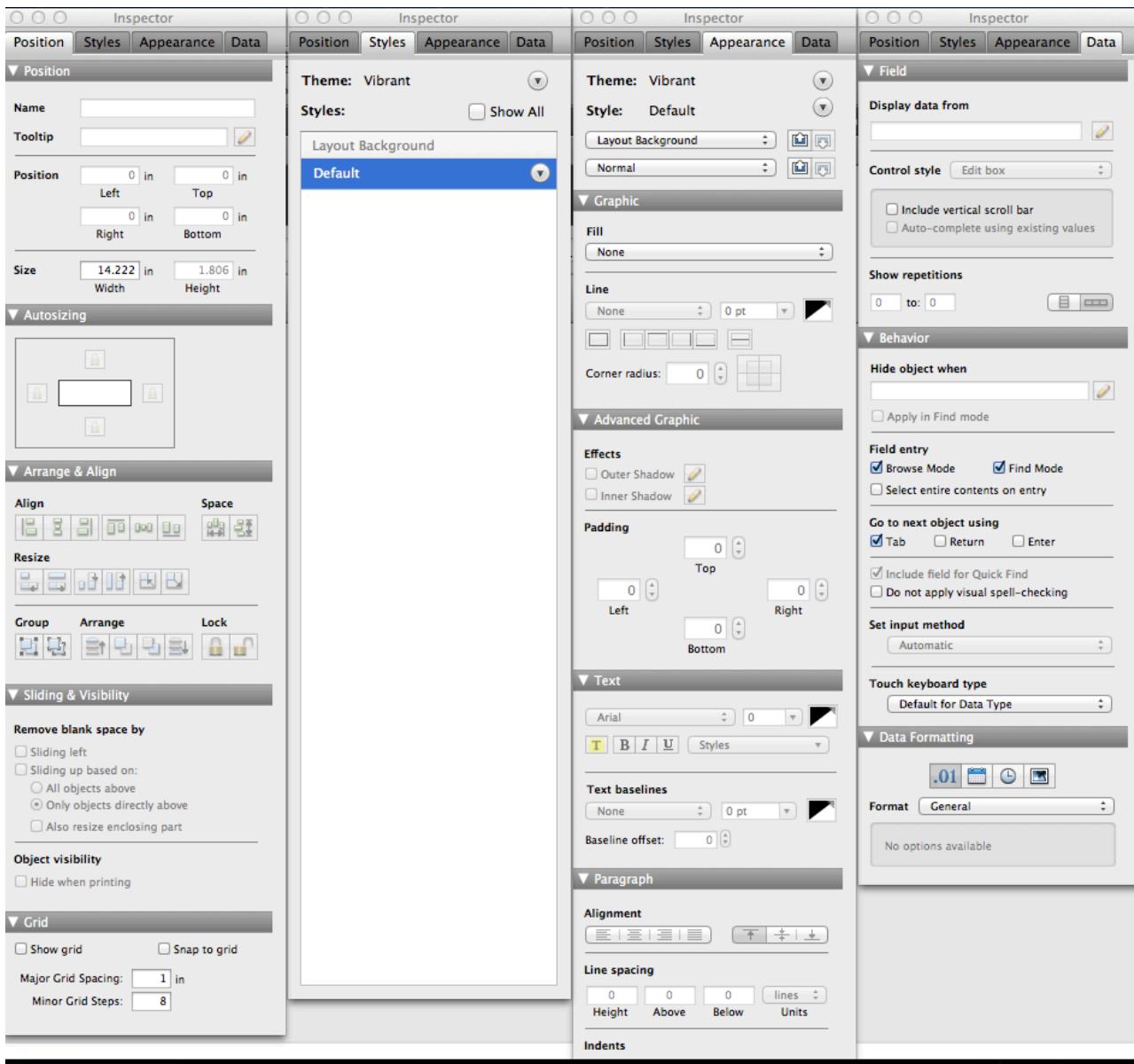


FIGURE 43

You can open and close **Inspectors** by using any of these methods:

- Choose **View > Inspector** (or **View > New Inspector** for multiple Inspectors)
- Click the  button in the layout bar.
- Use the keyboard shortcut **Command-I** (OS X) or **Ctrl-I** (Windows).

You can quickly switch to an **Inspector** tab by using the keyboard shortcuts **Command-1, 2, 3, and 4**.

# Layout Resizing

FileMaker Pro provides tools that allow faster, cleaner creation of a solution. Just like themes, which offer a consistent look and feel to a FileMaker solution, certain features of FileMaker Pro help you build a professional-looking database.

## Selecting, Resizing and Moving Objects

To select a layout object, click on the object (for example, any field in the Equipment Rental file is considered an object). You will see small squares, called handles, that represent the corners and sides of the object.

You can change the size of an object by dragging any of the handles. If multiple objects are selected while dragging the handles, the objects will all resize with respect to each other. This is very useful, especially when resizing a group of fields and other layout objects.

You can move an object that you have selected by dragging any part of the object other than its handles. To move an object a small distance, select it, then use the arrow keys on the keyboard to move an object one point (pt) at a time.

## Layout Width

To set the width of a layout, drag the dark gray line that represents the right edge of the visible layout area. This defines the area where objects will be seen in Browse mode. Any object placed outside of the layout's defined width is treated as an invisible object in Browse mode.

## Screen Stencils

When you are creating solutions for different platforms and screen sizes, FileMaker Pro contains a set of screen stencils that you can use for accurate layout sizing. You can easily optimize layouts for iOS devices by using a stencil.

Each stencil shows the borders of the iPad or iPhone in both portrait and landscape orientation to aid in design. The stencils can be turned on or off in the formatting bar. You can turn on multiple stencils at the same time for cross-platform solutions or for multi-orientation devices such as the iPhone and iPad. Figure 44 shows a layout with one 4" portrait iPhone stencil turned on.

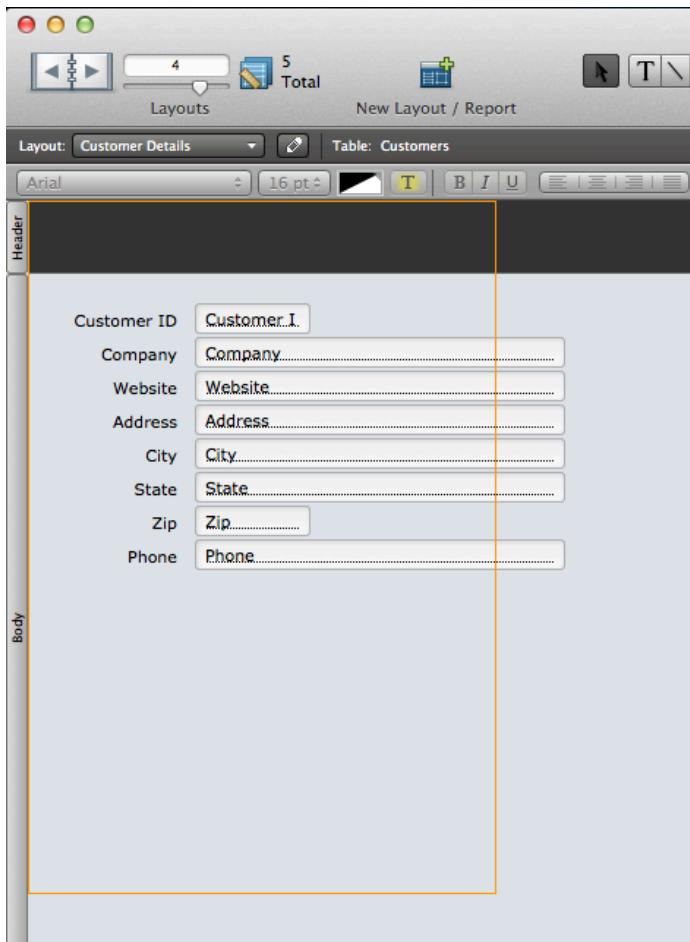


FIGURE 44

To toggle the screen stencils, click the stencil icon on the right side of the status toolbar, shown in Figure 45. Clicking the arrow will provide you with a list of stencils that can be turned on or off, including different desktop resolutions, iPhone, iPad, and a custom size.

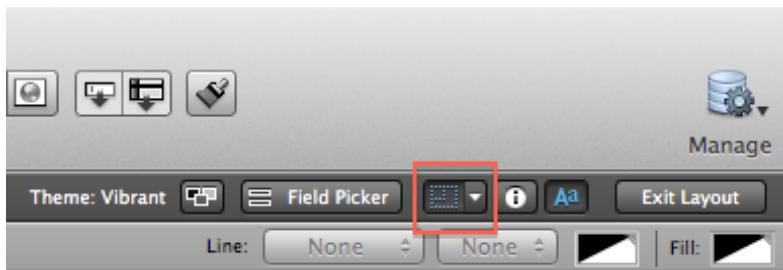


FIGURE 45

# Guides and Grids

## Dynamic Guides

Guides help you align objects on a layout during your solution creation process. The two types of guides are dynamic guides and ruler guides.

Dynamic guides enable you to quickly define the position and size of objects based on other objects on your layout. As you move or resize an object, blue lines appear to indicate that the object you are changing is aligned to other objects.

Figure 46 shows the dynamic guides that appear as you move or resize an object on a layout.

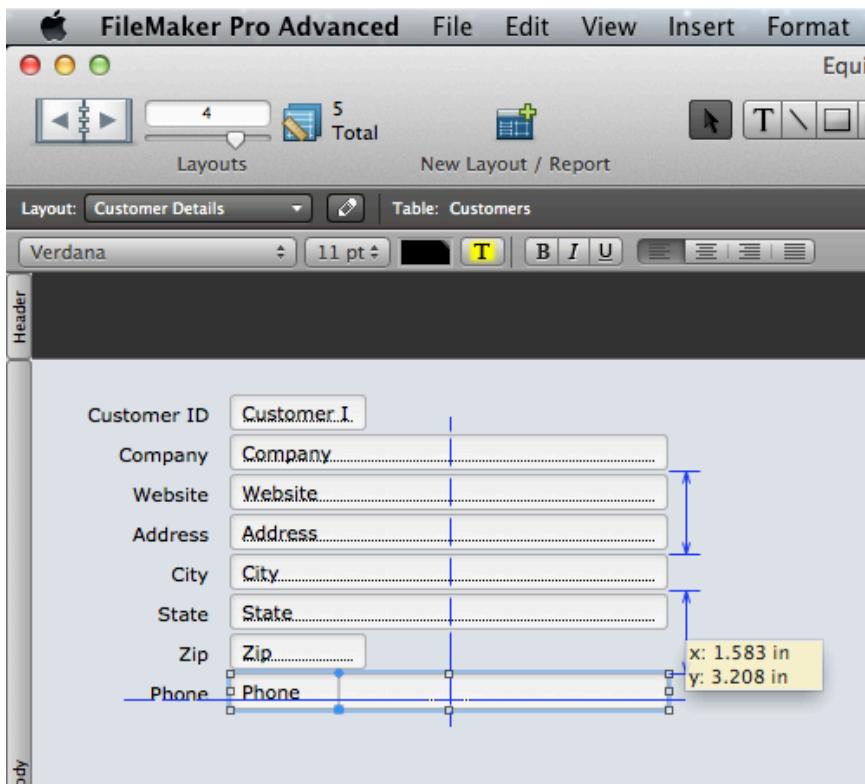


FIGURE 46

## Ruler Guides

In order to position objects on your layout more precisely, turn on the page rulers (choose **View > Rulers**). To create a ruler guide, click either the top ruler for a horizontal guide or the left ruler for a vertical guide, and drag the guide onto the layout. Figure 47 shows a layout with two horizontal guides and three vertical guides.

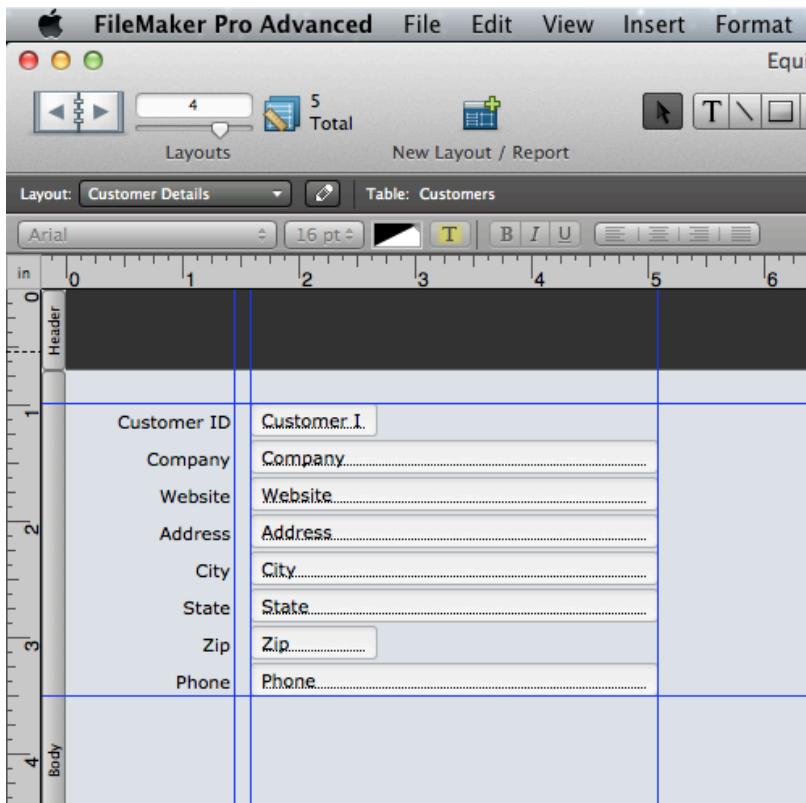


FIGURE 47

The **Snap to Guide** feature automatically aligns objects to the nearest guide when you move objects within a few points of the guide. (activate by choosing **View > Guides > Snap to Guide.**)

## Object Grid

---

In order to display a grid on your layout, turn on the **Object Grid**, which will show major and minor grid lines. Enable the **Object Grid** using either of these methods:

- Choose the **View > Grid > Show Grid**.
- Find it at the bottom of the **Position** pane on the **Inspector**.

When you check **Snap To Grid**, moving or resizing objects on your layout will cause them to snap to the major and minor grid lines. You can change the increments at the bottom of the Position pane on the Inspector.

# Using Layout Design Tools

During the Equipment Providers, Inc. discovery phase, you learned that Assets may be given to a Customer during an on-site visit, and the user needs to collect a signature confirming that the Asset was received. Since FileMaker Go serves as a great tool for mobility and capturing signatures, you will need to create an Asset layout for the iPhone and iPad.

## Activity 10.1: Creating an iPad Layout

You will create a **Form** view layout that is appropriately sized for the iPad.

1. Click on **New Layout/Report**.
2. Base the layout on the **Assets** table and name it "**Asset Details - iPad**".
3. Choose **Touch Device**. Then choose **iPad/iPad mini**.
4. Choose **Form**. Click **Finish**.
5. Change the theme to **Vibrant Touch**.
6. Turn on the iPad (portrait) screen stencil.
7. Set the **Drag Options** to vertical fields in the **Field Picker** with the labels on the left.
8. Add the following fields to the layout with the **Field Picker**, within the stencil. In **Browse Mode**, your layout should look like Figure 48:
  - Asset ID
  - Customer ID
  - Item
  - Model
  - Serial Number
  - In Service Date
  - Purchase Date
  - Cost
  - Signature
  - Notes

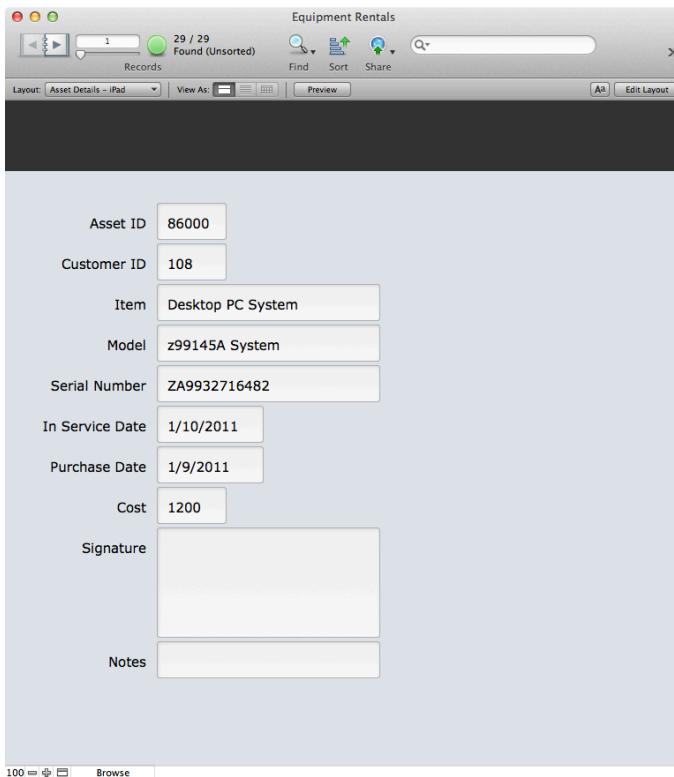


FIGURE 48

## Activity 10.2: Creating an iPhone Layout

You will create a layout that will be sized for a 4" iPhone screen.

1. Create a **Form** view layout based on the Asset table called "**Asset Details - iPhone**". Choose **Touch Device**. Then choose **iPhone 4-inch**. Choose **Form** and then click **Finish**.
2. Change the theme to **Vibrant Touch**.
3. Turn off the iPad screen stencils and turn on the iPhone 4-inch (portrait) screen stencil.
4. In the **Field Picker**, set the **Drag Options** to vertically align fields with the label on top like Figure 49.

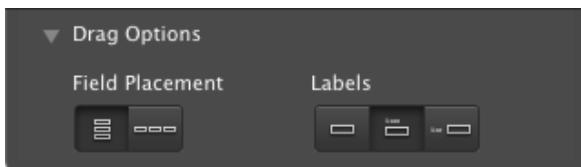


FIGURE 49

5. With less screen space on an iPhone, you may not want to include all the fields from the iPad layout. Add the following fields to the layout with the **Field Picker**:
  - Item
  - Serial Number
  - Signature
6. If necessary, extend the layout's height by dragging down the bottom edge of the **Body**. In **Browse** mode, your layout should look like Figure 50.

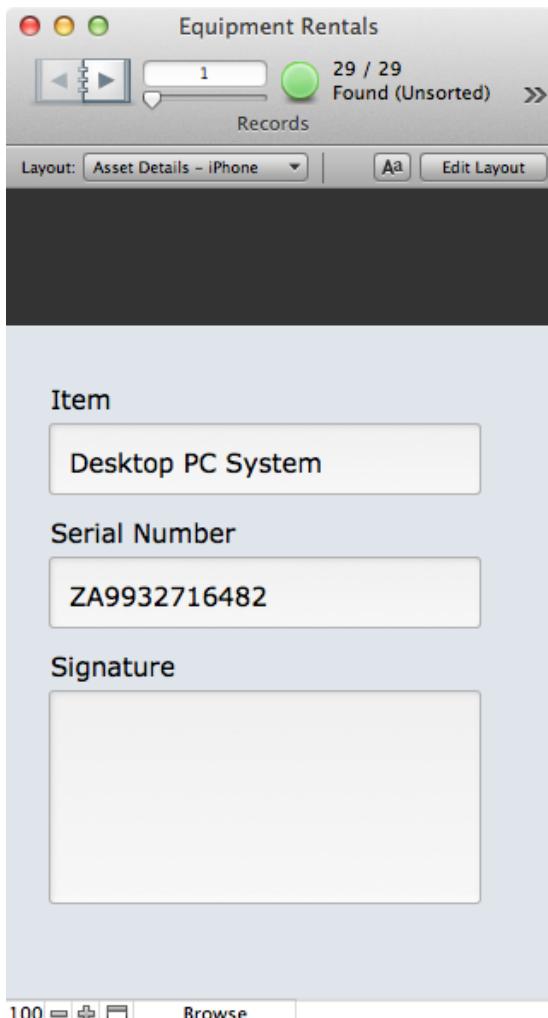


FIGURE 50

## Creating iOS Layouts

When creating a new layout for an iOS device, FileMaker Pro will create a script that is attached to the layout as a script trigger. This means that automation has been added to the layout based on user interaction with it. The script locks the zoom feature on the device, which prevents the layout from zooming in if a user accidentally double-taps on it.

## Review Questions

1. What is the name of the object control center where you can view and modify the settings for any object?
2. What do Screen Stencils show?
3. What is the difference between Dynamic Guides and Ruler Guides?

# Answers

1. The **Inspector** is the object control center where you can view and modify the settings for any object.
2. Screen stencils show the borders of a chosen device for the size specified.
3. Dynamic guides automatically display blue lines that help you align and size objects in relation to other objects on the layout. When designing a layout, you have control in setting ruler guides where you need them to align objects consistently on one or many layouts.

## Lesson 11

# Special Layout Objects

---

**Time:** This lesson takes approximately 20 minutes to complete.

**File:** Equipment Rentals.fmp12



# Objectives

---

After this lesson, you will be able to:

- Create a Portal
- Create a Tab Control
- Create a Panel Control
- Create a Popover
- Create a Web Viewer

From the **Status Toolbar**, you can add basic items such as text, shapes, fields, and a variety of special layout objects, as shown in Figure 51. These objects perform specific and special functions on a layout that you will learn about in this lesson.

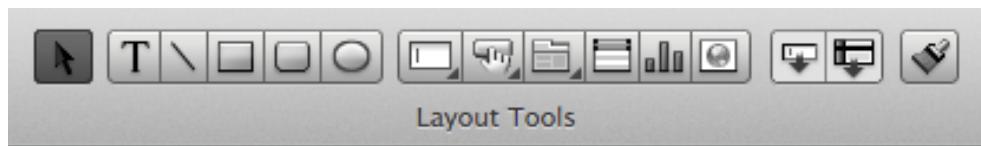


FIGURE 51

# Portal

A portal is a tool for displaying a set of related records. In a one-to-many relationship, a portal shows the "many" side of a relationship.

In Activity 8.2, you created a relationship from Assets to Customers, where the Asset's **Customer ID** field matches the Customer's **Customer ID** field.

## Activity 11.1: Viewing Related Data via a Portal

You will create a portal on the **Customer Details** layout that will show related Assets.

1. Navigate to the **Customer Details** layout and enter **Layout** mode. Turn off any screen stencils used in previous activities.
2. Portals are created by either clicking on the **Portal** tool  in the **Status Toolbar** or using the **Insert > Portal** menu item. For this step, choose **Insert > Portal**.
3. In the **Portal Setup** window, click on the **Show related records from:** drop-down and choose **Assets** as the related table (Figure 52).

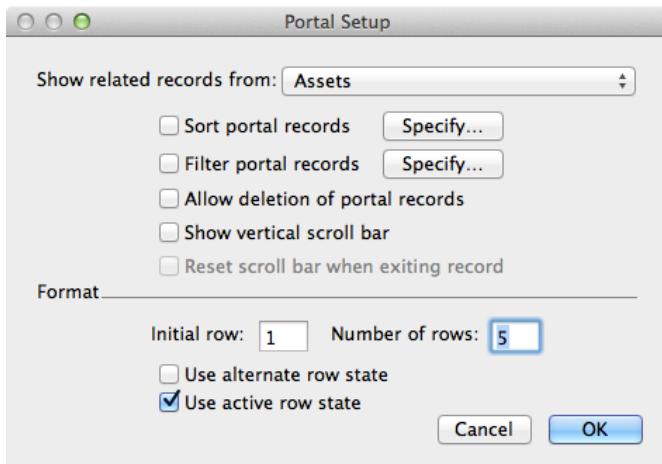


FIGURE 52

4. Activate **Show vertical scroll bar** to enable the user to scroll down if the list of related data extends beyond the viewable area. Click **OK**.

5. A window titled **Add Fields to Portal** will appear. **Double-click** on the following fields and click **OK**:
  - Category
  - Item
  - Serial Number
  - Purchase Date
  - Cost
6. A portal with related fields—in the first row—will appear on your layout. Move the portal to the right side of the screen.
7. Adjust the width of the portal and the related fields by making them bigger.
8. Unlike adding fields using the **Field Picker**, the **Portal** tool does not automatically create related field labels. Use the **Text** icon in the toolbar to manually add labels for each field.
9. Fields in portals can start to look busy. To reduce this visual clutter, select the fields, go to the **Style** tab in the **Inspector**, and choose the style called **Minimal Edit Box**.
10. Go to **Browse** mode and your layout should look similar to Figure 53.

The screenshot shows a FileMaker Pro window with the title bar "Equipment Rentals". The top menu bar includes "File", "Edit", "View", "Layouts", "Find", "Sort", "Share", and "Help". The toolbar contains icons for New Record, Delete Record, Find, Sort, and Share. The status bar at the bottom shows "100" and "Browse".

The layout "Customer Details" is displayed. On the left, there is a list of customer information:

Customer ID	103
Company	West Side Antiques
Website	westside.bizhost37.com
Address	500 West Main St
City	Paso Robles
State	CA
Zip	93446
Phone	(805) 555-1268

On the right, there is a portal displaying equipment rentals:

Category	Item	Serial Number	Purchase Date	Cost
Telephones	VOIP Telephone	779182737S	1/12/2012	75
Computers	15" Notebook	BN299765G	10/22/2012	1000

FIGURE 53

Earlier you created a relationship from Assets to Customers, where the Asset's **Customer ID** field matches the Customer's **Customer ID** field. In order to show data from a related record, change the **Current Table** drop-down in the **Field Picker** to the correct related table—in this case, Customers.

## Activity 11.2: Adding Related Fields

You will add the **Company** field to the **Asset Details - iPad** layout from the related Customers table.

1. Navigate to the **Asset Details - iPad** layout.
2. Enter **Layout** mode.
3. Using the **Field Picker**, change the **Current Table** drop-down in the **Field Picker** to the related table **Customers**, and change the **Drag Options** to not include a label.
4. Drag the **Company** field onto the layout next to **Customer ID** so it looks like Figure 54.
5. Enter **Browse** mode and navigate between records to view the company name for each asset.

Equipment Rentals

Records 29 / 29 Found (Unsorted) Find Sort Share >>

Layout: Asset Details - iPad View As: Preview Aa Edit Layout

Asset ID	86000
Customer ID	108 Vineyard Portraits, Inc.
Item	Desktop PC System
Model	z99145A System
Serial Number	ZA9932716482
In Service Date	1/10/2011
Purchase Date	1/9/2011
Cost	1200
Signature	[Redacted]
Notes	[Redacted]

100 | + | Browse

FIGURE 54

# Tab Control

A user interface that includes tabs, is a popular design feature for many applications. When you select a tab, it can display a unique set of objects or data, which allows you to use the same section of layout real estate for multiple purposes.

The term *tab control* refers to the entire layout object, as shown in Figure 55. Each tab control can contain one or more individual tabs, called tab panels. The tab control is not a navigation tool; it is a layout organization tool used to selectively display different sets of fields (or related fields) from the same layout context.

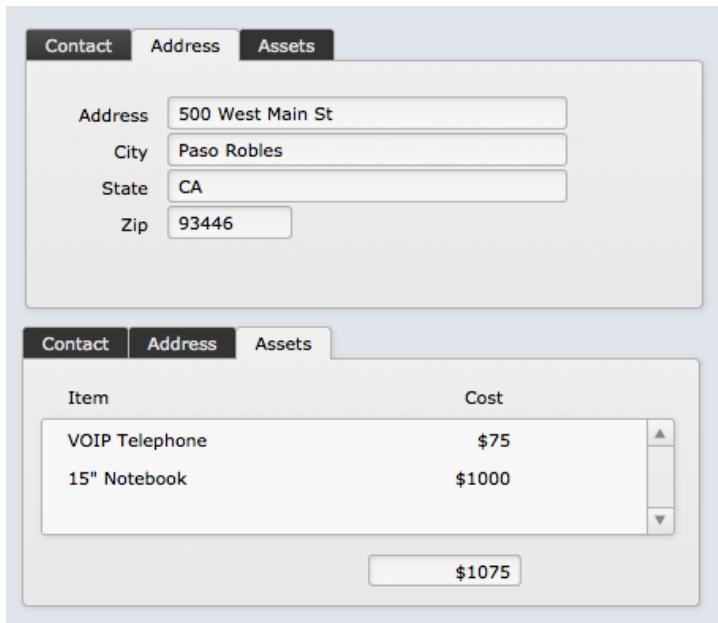


FIGURE 55

Tab controls are placed on the layout using the **Tab Control** tool  in the **Status Toolbar**. You can modify the appearance of a tab control object in several ways. You can add, rename, remove, or reorder the panels in a tab control through the **Tab Control Setup** dialog (shown in Figure 56). Access the **Tab Control Setup** dialog by **double-clicking or right-clicking** the tab object. The **Tab Control Setup** dialog also provides a way to define the default tab, the tab justification, and tab width.

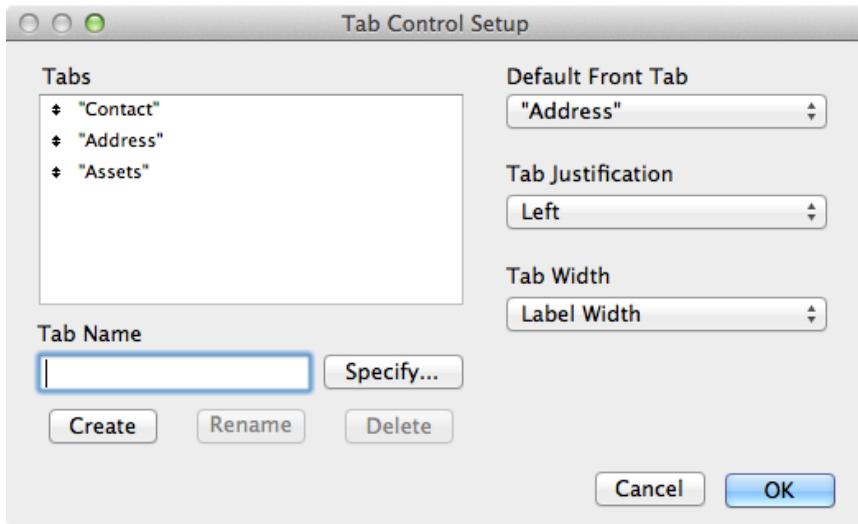


FIGURE 56

With the help of the **Inspector**, you can customize many aspects of your tab. Using the **Appearance** tab of the **Inspector**, you can specify the background fill, borders, and corner radius, as well as tab specific attributes for the hover state. However, all tabs must have the same text style attributes, such as font, color and size.

To place an object on a tab panel:

1. Enter **Layout** mode.
2. Select the tab panel.
3. Move the object so that it is entirely contained within the boundaries of the selected tab control.

If you need to move a tab control, simply drag the tab control object itself. All objects contained within all tabs will move.

# Slide Control

The slide control is a new type of layout object introduced in FileMaker Pro 13. It was inspired by the page control of the iOS interface. The springboard (or home screen) of an iPad, iPhone, and iPod touch is an example of an iOS page control.

Similar to the tab control, the term slide control refers to the entire layout object as shown in Figure 57.

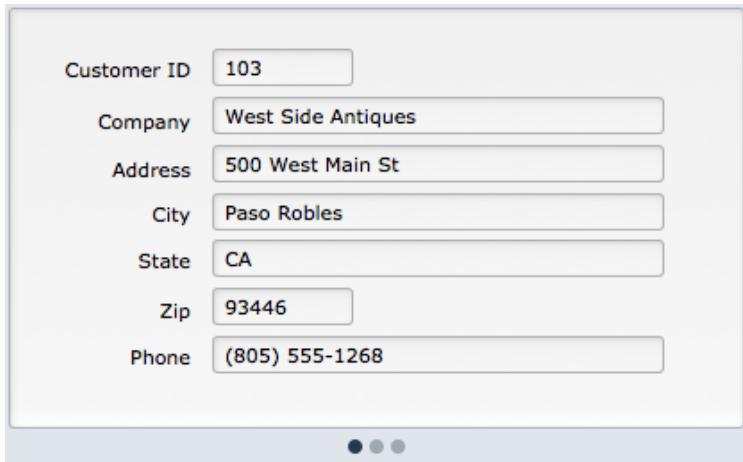


FIGURE 57

Each slide control can contain one or more slide panels. Because the two controls are related, the tab control and slide control are created using a single tool on the status toolbar.

To add a slide control to a layout:

1. Click and hold the **Tab Control**  or **Slide Control**  tool and select **Slide Control**.
2. Click and drag on the layout to draw the boundaries of the new slide control.

After drawing the boundaries of the slide control, the **Slide Control Setup** dialog, shown in Figure 58, will appear. It can also be opened by double clicking the slide control object. The **Slide Control Setup** dialog includes settings for specifying the number of panels, whether or not FileMaker Go users can swipe to navigate between panels, whether or not navigation dots are displayed and specifying the size of the navigation dots.

Note that when the dots are not displayed, the developer must provide buttons or some other scripted way to navigate between slide panels.

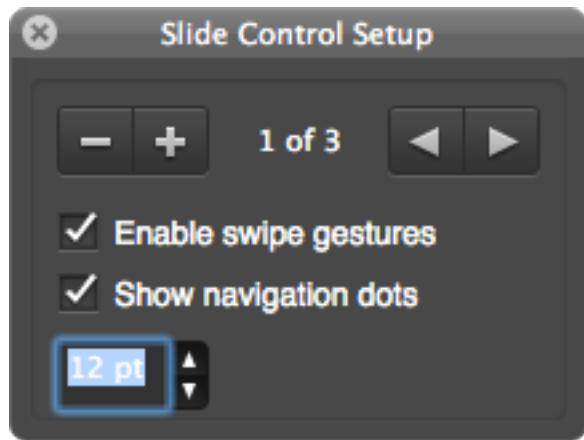


FIGURE 58

# Popover

Like the slide control, the popover button is a new type of layout object introduced in FileMaker Pro 13. A popover button expands to display a popover object that floats over the window, obscuring the content behind it. Figure 59 shows a popover button that has been clicked to reveal the popover object. The popover object is a panel in which you can display any type of layout object. Similar to a tab control or slide control, it has the same context as the layout.

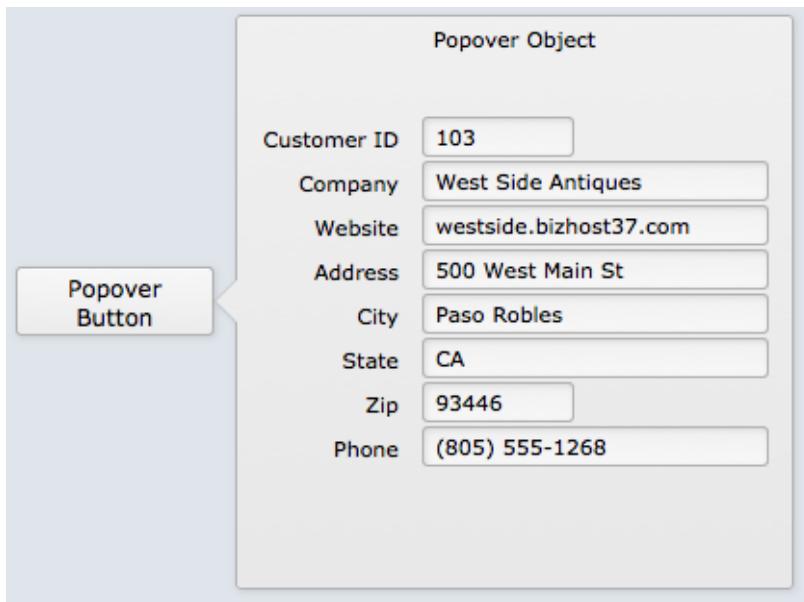


FIGURE 59

Popover buttons are handy in situations where you might otherwise have opened a new window. Some examples of how a popover button can be useful include displaying:

- Detailed information about an object or data
- A portal containing a related set of data
- A web viewer used to render a map, dashboard, or aggregate information
- Help text to give the user instructions
- A navigation bar or navigation sub-menu

Similar to tab controls and slide controls, a single tool on the status toolbar is used for creating buttons and popover buttons.

To add a popover button to a layout:

1. Click and hold the **Button**  or **Popover Button**  tool and select **Popover Button**.
2. Click and drag on the layout to draw the boundaries of the popover button.

When a popover button is created, its popover object is automatically created. The **Popover Setup** dialog, shown in Figure 60, is also displayed. It provides options for specifying the popover title, the location of the popup object relative to the button, and configuring script triggers.

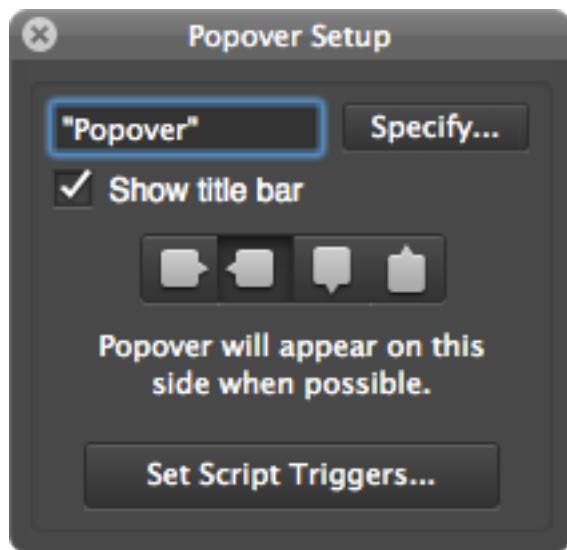


FIGURE 60

Once the **Popover Setup** dialog is closed, it can be displayed again by double-clicking the popover object or by right-clicking the popover object and selecting **Popover Setup**.

# Web Viewer

A web viewer is an object used to display web pages directly in a FileMaker layout. Web viewers have many practical uses in FileMaker solutions. For example, a web viewer can:

- Display a map website that contains directions to the address stored in a company record
- Calculate the URL for tracking a package based on data stored in a tracking number field

Other uses include embedding access to search engines, looking up stock quotes, and generating reports and graphs. The Web Viewer Setup dialog allows you to construct the URL that the web viewer uses to display a web page. The URL usually includes fields in the calculation, meaning that data from the current record can be used to dynamically search the web.

Note: The user's device or computer must be connected to the Internet in order for a web viewer to display an external web page.

## Activity 11.3: Adding a Web Viewer

In this example, you will add a web viewer to the **Customer Details** layout that displays Google Maps search results for the customer's address. Please note that you will need to be connected to the internet in order for the web viewer in this example to function properly.

1. Go to the **Customer Details** layout and go into **Layout** mode.
2. Select the **Web Viewer** tool ( icon) in the **Status Toolbar**. Define the area on the layout by drawing a box for the boundaries of the new web viewer. The **Web Viewer Setup** dialog will appear.
3. Choose **Google Maps (US)** in the **Choose a Website** box on the left hand side.
4. Click on the  button next to the Address box and select **Specify Field Name...**
5. Choose the **Address** field from the **Customers** table and click **OK**.

6. Repeat steps 4 and 5 for the City, State, and Zip Code boxes, selecting the **City**, **State**, and **Zip** fields from the **Customers** table accordingly. The **Web Viewer Setup** dialog should look like Figure 61 when you are done.

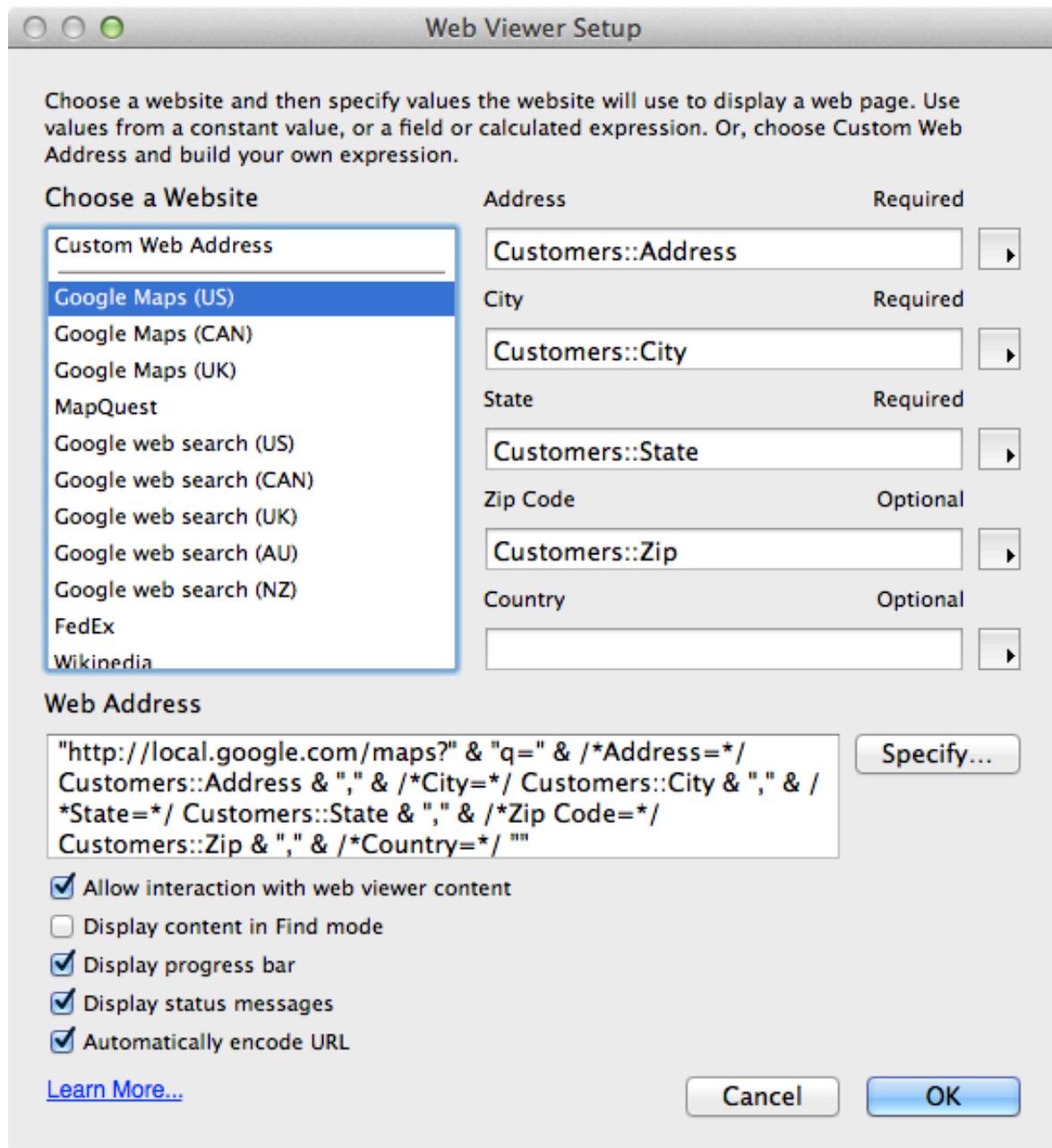


FIGURE 61

7. Click **OK** on the **Web Viewer Setup** dialog, save the layout, and go into **Browse** mode. Your layout should look similar to Figure 62.

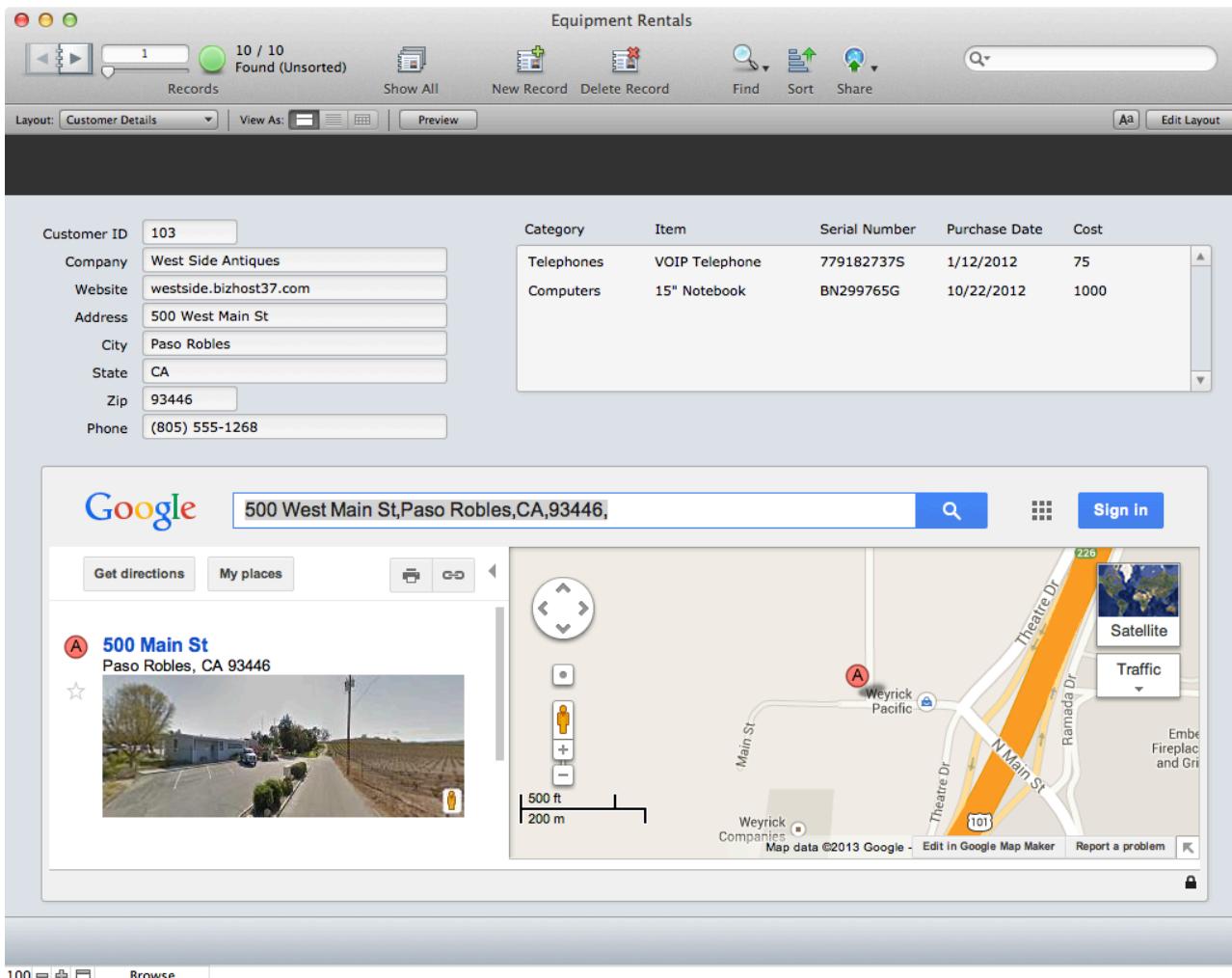


FIGURE 62

Navigate through Customer records to test the web viewer. It should display Google Maps search results for the address of the current Customer record.

Note: You may need to make the web viewer, and possibly the layout, larger in order to view the contents of the Google Maps page.

## Review Questions

1. What are the five special layout objects?
2. A portal can be used to view which side of a relationship?
3. How do you add an object to a tab control?
4. What are some uses for popover buttons?
5. How can Web Viewers be dynamic?

# Answers

1. Portals, tab controls, slide panels, popovers, and web viewers are five special layout objects.
2. Portals are used to view the “many” side of a relationship.
3. To add an object to a tab control, select the tab panel you would like the object to reside on, then drag the object onto the panel until it is completely surrounded by the tab control.
4. Popovers can be used for situations where you might have needed another window including detailed information about other data, map, help text, navigation bar.
5. Web viewers can go to websites based on field data, allowing them to dynamically search the web.

## Lesson 12

# Formatting Field Objects

---

**Time:** This lesson takes approximately 20 minutes to complete.

**File:** Equipment Rentals.fmp12



# Objectives

---

**After this lesson, you will be able to:**

- Format a date, number, or time field object
- Apply Conditional Formatting to a field
- Change the Control Styles for a field
- Create a static value list

Users spend much of their time viewing and editing data in the solution. FileMaker has many options to formatting data which creates a consistent experience for users. Developers can also speed up the entry of data by providing users with pop-up menus, drop-down calendars, and more.

In this lesson, you will learn about the different ways to format dates, times, and numbers, the options for formatting objects based on certain conditions, and controls for data entry.

# Data Formatting

In addition to specifying attributes of your data including font and color, FileMaker Pro allows you to display numbers and dates with special formatting—such as currency, a percent, a specific date format, and so on. The **Inspector** helps you apply these types of formatting at the object level.

By default, the formatting for a date field will be **As Entered**. If a user types 6/7/2013 or 6.7.2013, the user would see the values exactly as the user entered it. On a list view layout, inconsistency in formatting can make it harder to scan and quickly read the data.

With Data Formatting, you have the flexibility to format that data in numerous ways for consistency, while users can enter data in any format they wish.

## Activity 12.1: Applying Formatting to Fields

You will change the formatting on the date fields so they will show consistently, regardless how the user entered the data.

1. Navigate to the **Asset Details - iPad** layout
2. Enter **Layout** mode and open the **Inspector**.
3. Select the **In Service Date** and **Purchase Date** fields by holding down the **Shift** key and clicking on both fields.
4. In the **Inspector**, choose the **Data** tab. The last section is titled **Data Formatting**.
5. Click on the **Format** drop-down to see all the date formatting options.
6. Choose the format that shows the date in **MM/DD/YY (12/25/03)** format. In the example above, regardless of how the user enters the date, it will now display on this layout as 6/7/13.
7. Change the data formatting for the **Cost** field by choosing **Currency** and setting the **Fixed number of decimals:** to **2**.
8. Increase the width of the **Cost** field so that you will be able to see the result (Figure 63). Return to **Browse** mode.

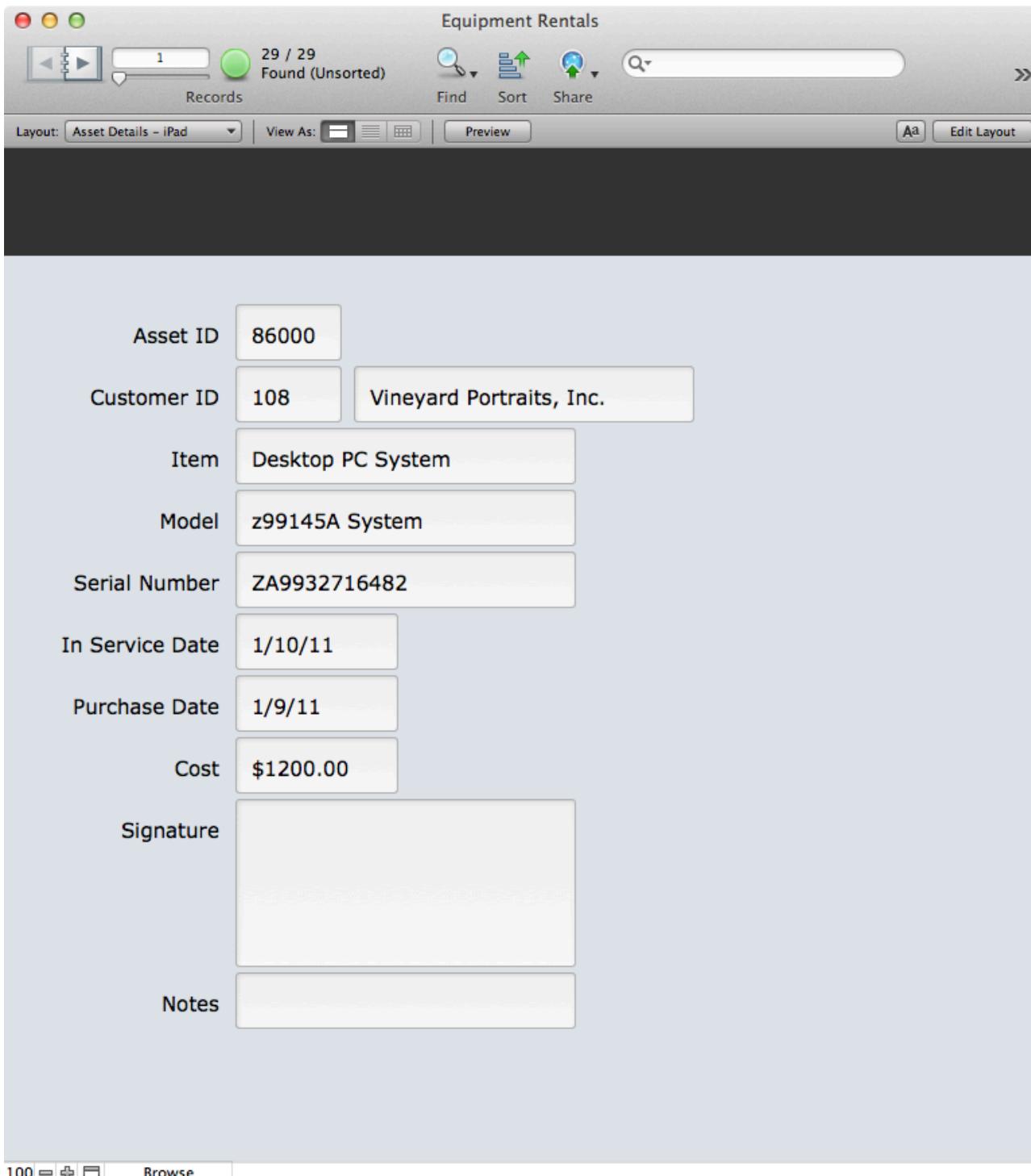


FIGURE 63

Formatting fields is a common practice in order to keep your data looking consistent. Often, numbers are shown as currency for a price field and as a percentage for a margin field. Time fields can be set to 12 or 24 hour formatting. For Container fields, you can specify whether the original proportions will be maintained, as well as if the user will be able to interact with certain file types, like PDFs and videos.

# Conditional Formatting

Conditional formatting allows you to change the look of an object based on specified rules. By doing so, you can draw a user's attention to data that might be missing, incorrect, or outside of certain boundaries. For example, you can specify that a field have a red background color when it is empty, and white when the field contains a value. Or, a price field might display bold and red if its value is greater than \$5,000.

## Activity 12.2: Using Conditional Formatting

You will apply conditional formatting to the **Cost** field. If the cost is more than \$1,000, the cost will appear in blue.

1. On the **Asset Details - iPad** layout, in **Layout** mode, select the **Cost** field.
2. Choose **Format > Conditional....** A window will appear, allowing you to set the criteria that will activate the conditional formatting.
3. Click **Add**.
4. In the **Condition** section, change **between** to **greater than**, then type "**1000**".
5. In the **Format** section, activate **Text Color** and choose a bright blue, as shown in Figure 64 and click **OK**.

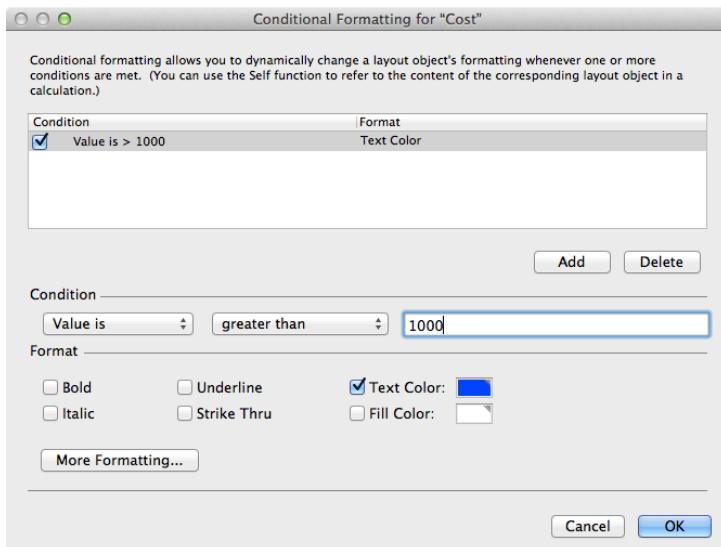


FIGURE 64

6. Enter **Browse** mode and look at different records. Notice that any value over 1000 (but not equal to 1000) shows as blue text.

# Field Control Styles

Whenever people manually type in data, misspelling and inconsistencies occur. Field control styles are used to format how users interact with fields. The two primary benefits of field control styles are:

- Users can enter data faster
- Your data will be more accurate and consistent

To set the control style for a specific field, open the Inspector and use the **Field** section of the **Data** tab.

There are six different control styles. They are:

- **Edit Box:** This is a standard field for free form data entry. An Edit Box can have a vertical scroll bar, and have the option to auto-complete data from previously entered values.
- **Drop-down List:** You can use this style to enable users to choose an item from a value list, or to manually enter a value. Use this option when there are a large number of values to choose from.
- **Pop-up Menu:** To use this style, you must click on the menu to activate it, then see your available choices. This style is good when there are only a few items in the list, because the pop-up menu grows to show all the possible choices.
- **Checkbox Set:** This style presents the value list as a set of checkboxes that people can select and deselect. More than one checkbox can be selected.
- **Radio Button Set:** Radio buttons are similar to checkboxes, except that clicking one radio button causes a different radio button to be deselected—so only one value is selected at a time. This style is appropriate for lists with exclusive choices, such as yes or no.
- **Drop-down Calendar:** This control style allows people to select a small drop-down calendar, then enter a date into a field.

# Value Lists

Value lists in FileMaker Pro help facilitate rapid data entry and minimize the possibility of data errors, misspellings or inconsistency. Instead of requiring a user to type something like a project status, you can set up a value list so the user can choose Active, Inactive, or Pending from a drop-down list or a radio button set.

A value list can be made of static values, like the project status example above, or it can be a dynamic list, which means that the values are drawn from a table in your FileMaker solution. This type of dynamic list is used frequently for selecting the value for a foreign key field.

In the Equipment Rentals file, the **Category** field in the Assets table is a great candidate for a drop-down list, especially if the values that can be entered are consistent. The Equipment Rental discovery phase provided information about incorrect and misspelled values in the data. By setting the field with a drop-down list, there is less chance for error in data entry.

## Activity 12.3: Using Field Controls and Value Lists

1. On the **Asset Details - iPad** layout, enter **Layout** mode.
2. Add the **Category** field to the layout, below **Customer ID** and above **Item**.
3. Click on the **Category** field. In the **Inspector**, choose the **Data** tab. In the **Field** section, click on the **Control Style** list and choose **Drop-down** list.
4. Click on the pencil icon next to **Values from**. This will bring up the **Manage Value List** dialog. Click **New**.
5. Name the value list **Categories**.
6. Type the following into the custom values, as shown in Figure 65:

Appliances  
Cameras  
Computers  
Office Furniture  
Telephones

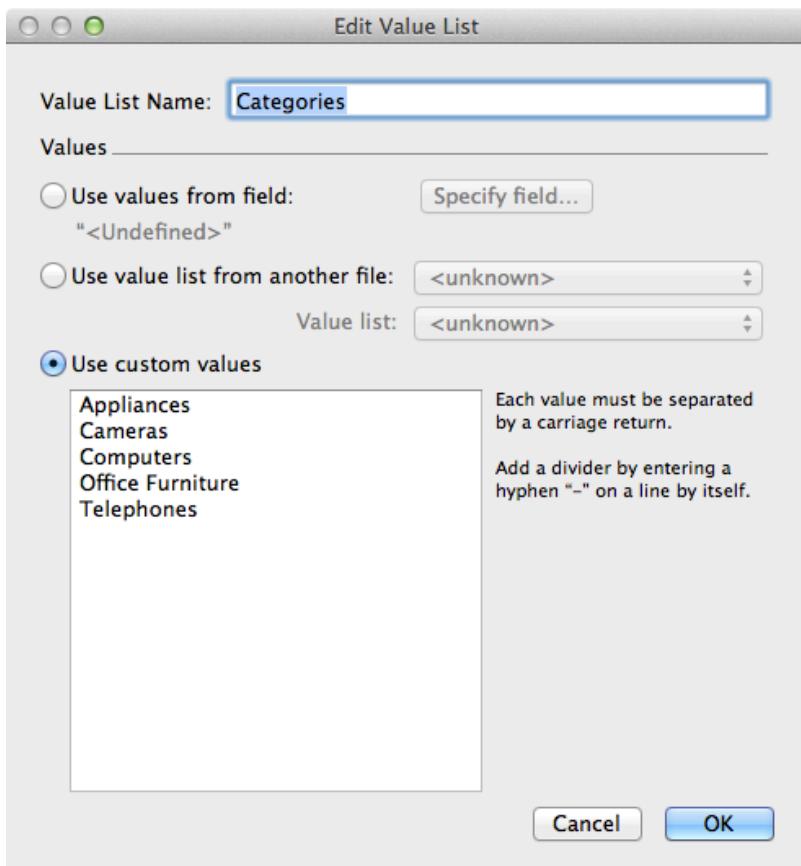


FIGURE 65

7. Click **OK** to close the **Edit Value List**. Click **OK** again to close the **Manage Value Lists** dialogs.
8. Switch to **Browse** mode and click in the **Category** field. From now on, when a user clicks in the **Category** field, the list of values will appear.

Similar to conditional formatting, field control styles are applied per object. If you want to add a drop-down list to any instance of the Asset's **Category** field on a layout, you will need to edit each instance.

## Review Questions

1. What is the main goal of data formatting?
2. How can conditional formatting help users?
3. How can field control styles improve data consistency?
4. What are the two types of value lists?

# Answers

1. The goal of data formatting is to make data look consistent and not dependent on user entry.
2. Conditional formatting helps draws users attention to important data on a layout by affecting the objects styles.
3. Field control styles improves data consistency by allowing users to select from a set of values instead of typing free form.
4. The two types of value lists are static (using custom values) and dynamic (using values from a field).

## Lesson 13

# User Interface Best Practices

---

**Time:** This lesson takes approximately 5 minutes to complete.



# Objectives

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**After this lesson, you will be able to:**

- **Create layouts with a purpose**
- **Create better layouts for touch devices**
- **Create layouts with a pleasing, consistent experience**

The last four lessons demonstrated many of the tools for building interfaces in FileMaker. With all of the options at your disposal, it is helpful to have some guidelines for building the best possible solution for your users.

This lesson will provide you with a list of best practices for building interfaces in FileMaker, including guidelines for the support of multiple devices, the usage of color and styles, and the need for a consistent and predictable interface.

# User Interface Best Practices

Here are some guidelines for you to follow when building your solutions.

- **Build Layouts for each device type** - For the best user experience, you will want to create layouts for each device. For example, use one layout for an iPhone, a different one for an iPad, and yet another for a laptop or a large desktop display. Each device has unique properties. Building separate layouts for each device ensures that your solution is the best it can be on each type of device.
- **Purpose** - The purpose of each screen should be clear and easy to understand. Users should quickly be able to figure out what the layout is for and take action.
- **Hierarchy** - Each screen should have a clear, well-defined hierarchy of information. This helps users zero in on their most-needed information.
- **Touch** - When building for iOS devices, buttons should be a minimum of 44pt x 44pt to ensure they can be easily tapped with a finger.
- **Avoid typing when possible** - On a touch interface, typing is not always the optimal input method. Even on a computer or web browser, less typing is more efficient. Utilize intelligent default field values, value lists, and date pickers.
- **Color** - You can enhance the presentation of information using the judicious use of color. However, be careful because too much color can easily become distracting and difficult for the user to process. Your user interface should not compete with the data it is presenting.
- **Proximity and Grouping** - Items that are close together should be logically related to one another. Grouping fields together can segment the workflow and helps users to find information easily.
- **Design Patterns and Grids** - Your solution may be unique, but you don't have to reinvent the wheel. Use common design patterns and the Apple Human Interface Guidelines to capitalize on models that users are already familiar with. Use grids as a framework for how information will be presented. Designing on a grid helps maintain grouping, spacing and consistency across different screens.
- **Whitespace** - Make sure that the layout is not crowded with too many objects. It is better to have more screens that are concise in their design and purpose, than one large screen that tries to cram every type of information onto it. Let your layouts breathe.

- **Consistency** - Use a consistent design model throughout your solution. In other words, think through your system for all the different kinds of screens you might need to create, and apply your methodology the same way in all parts of the system. Once users become familiar with the presentation of information and the actions of objects in one area, they can count on other parts of the system working the same way.

## Read the Human Interface Guidelines

The iOS Human Interface Guidelines describe the principles that help you design a superlative user interface for iOS apps. These principles are just as important for solutions you build with the FileMaker Platform as they are for apps built for the App Store.

Apple's iOS Human Interface Guidelines can be found here:

<https://developer.apple.com/library/ios/documentation/UserExperience/Conceptual/MobileHIG/>

## Read the FileMaker WebDirect Guide

When creating webpages with FileMaker WebDirect, it is important to follow best practices for web design. The **FileMaker WebDirect Guide** will give you the information you need. This includes everything from using web-safe fonts and colors to only including the objects your users need on each page for faster page load.

The **FileMaker WebDirect Guide** can be found here:

[https://fmhelp.filemaker.com/docs/13/en/fm13\\_webdirect\\_guide.pdf](https://fmhelp.filemaker.com/docs/13/en/fm13_webdirect_guide.pdf)

## Review Questions

1. How does having a clear hierarchy help a user interact with a solution?
2. What should be the minimum size of a button on a touch device?
3. What way of inputting data should be avoided when possible in a touch solution?
4. Why is consistency of the interface across a solution helpful?

# Answers

1. Having a clear hierarchy helps users zero in on the content they need.
2. Buttons should be at least 44pt x 44pt.
3. Typing with the onscreen keyboard should be avoided when possible.
4. Consistency of the interface across a solution helps users become familiar with your solution by making new areas of the solution to work the same way as other areas.

## **Lesson 14**

# **Calculations**

---

**Time:** This lesson takes approximately 20 minutes to complete.

**File:** Equipment Rentals.fmp12



# Objectives

---

After this lesson, you will be able to:

- Use the Specify Calculation dialog to define calculation fields
- Use Functions to manipulate data
- Use Operators to perform math and compare data

Calculations are a key tool for solution logic. Solution logic lets users complete tasks quickly and efficiently. It can also be used to control data updates and other processes resulting in better data integrity.

You will use calculation functions for many tasks while you work with a FileMaker solution. These tasks include displaying calculation field results, field auto-entry and validation, displaying tooltips, filtering portals, displaying conditional formatting, and various scripted operations. Because you will use calculation functions so often, mastering them is essential.

Here is what you learned about Calculations from the [Getting Started Tour](#).

- Creating Solutions > Calculations
  - FileMaker Pro can perform simple and complex calculations on your data. For example, you can calculate a discounted price based on a list price and a discount percentage.
  - Your calculations can include text, number, date, time, and container data.

# Creating Calculations

## Specify Calculation Dialog

All calculations in a FileMaker solution are defined using the **Specify Calculation** dialog. The **Specify Calculation** dialog allows you to work with fields, operators, and functions to create a formula. In certain cases, you can also control the result type and storage.

Figure 66 shows the **Specify Calculation** dialog for defining a calculation field. You can double-click the fields, operators, and functions to insert them into the formula entry space. If you prefer, you can also type them manually.

When defining calculation fields, you can specify the result type at the bottom left of the **Specify Calculation** dialog. The result type dictates how the output will be interpreted by FileMaker Pro. Set the result type to that expected of the calculation. For example, the formula **Get(CurrentDate) + 14** would be expected to return a date 14 days from today. The formula **FirstName & " " & LastName** would be expected to return text that is the person's full name. The formula **UnitPrice \* Quantity** would be expected to return the total cost for a group of items purchased together.

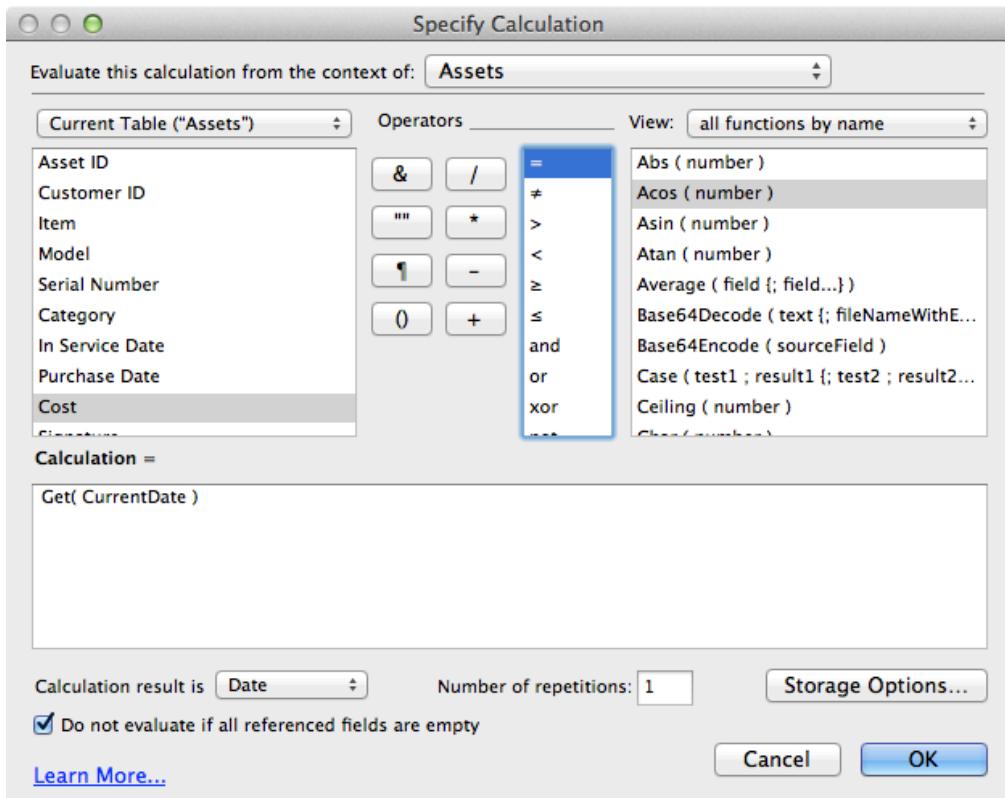


FIGURE 66

## Creating Calculation Fields

A requirement for the Equipment Rentals file, is that it provides users with two specific pieces of information: the number of days a Customer has leased an Asset and the total cost of a Customer's Assets. Calculation fields can be used to accomplish both of these tasks.

### Activity 14.1: Creating a "Days Leased" Number Calculation Field

First you will define a field to calculate the number of days a Customer has leased an Asset. For this solution, the number of days leased is the difference between the current date and In Service Date.

1. Navigate to the **Fields** tab of the **Manage Database** dialog. Choose the **Assets** table in the **Table** drop-down, if it is not already selected.
2. Type **Num Days Leased** in the **Field Name** box.
3. Choose **Calculation** as the **Field Type**.
4. Click **Create**.
5. Type the formula **Get(FromDate) - In Service Date** in the formula entry space.
6. Choose **Number** for the result type in the lower left corner of the dialog.
7. Click **OK** to exit the **Specify Calculation** dialog and click **OK** again to exit the **Manage Database** dialog.
8. Add the **Num Days Leased** field to the **Asset Details - iPad** layout, shown in Figure 67 and check the results of the calculation by modifying the **In Service Date** field on a few records.

Equipment Rentals

Records 1 29 / 29 Found (Unsorted) Find Sort Share >>

Layout: Asset Details - iPad View As: Preview Aa Edit Layout

Asset ID	86000		
Customer ID	108	Vineyard Portraits, Inc.	
Category	Computers		
Item	Desktop PC System		
Model	z99145A System		
Serial Number	ZA9932716482		
In Service Date	1/10/11	Num Days Leased	1038
Purchase Date	1/9/11		
Cost	\$1200.00		
Signature			
Notes			

100 Browse

FIGURE 67

# Functions and Operators

## Functions

Functions are used in calculations to perform specific tasks and return a result. Many functions accept data as a parameter and will manipulate that data to produce a result. For example, the **Length** function takes a single text parameter and returns the length of that text:

```
Length ( "Eugene" )
```

Result: 6

There are hundreds of calculation functions. The types of calculation functions available include text, number, date, time, text formatting, financial, aggregate, **Get** functions, and more.

**Get** functions are noteworthy because many of these functions provide information regarding the user's current session. This gives you access to information like the user's account name, the current layout, the type of device being used, and the current date and time.

## Activity 14.2: Creating a "Total Cost of Assets" Number Calculation Field

Next, you will create a calculation field to determine the total cost of a Customer's Asset, which is the sum of the **Cost** field across all of the Assets attached to a Customer.

1. Navigate to the **Fields** tab of the **Manage Database** dialog. Choose the **Customers** table in the **Table** drop-down.
2. Type "**Total Cost of Assets**" in the **Field Name** box.
3. Choose **Calculation** as the Field Type.
4. Click **Create**.
5. Type the formula **Sum (Assets : :Cost)** in the formula entry space.
6. The calculation result in the lower left corner of the dialog should be set to **Number**.

- Click **OK** to exit the **Specify Calculation** dialog and click **OK** again to exit the **Manage Database** dialog.
- Add the **Total Cost of Assets** field to the Customer Details layout as shown in Figure 68 and check the results of the calculation. The **Total Cost of Assets** field should equal the sum of the **Cost** field from each of the Customer's related Asset records.

The screenshot shows a table with five columns: Category, Item, Serial Number, Purchase Date, and Cost. There are two rows of data: one for a VOIP Telephone and one for a 15" Notebook. A vertical scroll bar is visible on the right side of the table. Below the table, a summary section displays "Total Cost" followed by a text input field containing the value "1075".

Category	Item	Serial Number	Purchase Date	Cost
Telephones	VOIP Telephone	779182737S	1/12/2012	75
Computers	15" Notebook	BN299765G	10/22/2012	1000

Total Cost

FIGURE 68

## Operators

In addition to the many functions available, operators will often be required in order to achieve the desired calculation result. FileMaker Pro provides the following operators for use in calculations:

- Standard math operators: Add, subtract, multiply, and divide
- Text operators: Ampersand, which is used to append one string to another; carriage return (¶); quotes for specifying literal text; and parentheses to manage the order of operations
- Logical operators: <, >, and, or, not, and so on

When using math operators, the order of operations in calculation formulae follows the rules of standard mathematics. Expressions within parentheses are evaluated first, then multiplication and division from left to right, then addition and subtraction from left to right. For example: **8 – 3 \* ( 1 + 1 )** returns **2**.

Text operators allow you to combine two or more text items into one larger item. For example, the formula **FirstName & " " & LastName** would return a person's full name. Note that a space is needed within quotes to properly separate the contents of the **FirstName** and **LastName** fields.

Next to the operator buttons are the logical operators, which are used to compare two expressions and return a true or false (1 or 0) result. This is known as a Boolean result. For example, **(grade > 80 and grade ≤ 89)** will return a value of **1**, or true, when the grade field contains a number greater than 80 but less than or equal to 89.

### Activity 15.3: Creating a Text Calculation Field

In this activity you will create a Full Address calculation field.

1. Navigate to the **Fields** tab of the **Manage Database** dialog. Choose the **Customers** table in the **Table** drop-down if it is not already selected.
2. Type “**Full Address**” in the **Field Name** box.
3. Choose **Calculation** as the Field Type.
4. Click **Create**.
5. Type the formula **Address & "¶" & City & ", " & State & " " & Zip** in the formula entry space.
6. The calculation result in the lower left corner of the dialog should be set to **Text**.
7. Click **OK** to exit the **Specify Calculation** dialog and click **OK** again to exit the **Manage Database** dialog.
8. Add the **Full Address** field to the **Customer Details** layout. The calculation result in the Full Address field should look similar to Figure 69.

The screenshot shows a database record for Customer ID 103. The fields and their values are:

Customer ID	103
Company	West Side Antiques
Website	westside.bizhost37.com
Address	500 West Main St
City	Paso Robles
State	CA
Zip	93446
Phone	(805) 555-1268
Full Address	500 West Main St Paso Robles, CA 93446

FIGURE 69

There are many other things you can do with calculations. For example, you can create a calculated status field that compares an Invoice's due date with the current date and returns either "Open" or "Overdue". Another common use of calculations is to create display fields that concatenate data from multiple fields into a desirable format. You might create display fields for Full Name or Address, for example.

## Review Questions

1. What are the three types of objects you can add to a calculation?
2. What do **Get** functions return?
3. What is a function?
4. What are the different types of operators?

# Answers

1. The three types of objects you can add to a calculation are fields, operators, and functions.
2. The **Get** functions returns information about the user's current session.
3. A function is used in a calculation to perform a task and produce a result.
4. The three different types of operators are math, text, and logical.

## Lesson 15

# Scripting

---

**Time:** This lesson takes approximately 20 minutes to complete.



# Objectives

---

**After this lesson, you will be able to:**

- Create, Edit, and Organize scripts
- Attach scripts to buttons
- Trigger scripts when opening a solution

Scripting is another important aspect of solution logic. Scripting is a very powerful tool in FileMaker Pro that allows you to specify a series of actions that can be triggered in a variety of ways. Scripts can serve many purposes, from simple navigation tasks to complex reporting and workflow needs. Scripts can be called via buttons on layouts as well as via script triggers, which activate a script when a certain action happens, like entering a layout, navigating between records, or opening a file.

Here is what you learned about Scripting from the **Getting Started Tour**.

- Creating Solutions > Scripts
  - With FileMaker Pro scripts, you can automate tasks like creating reports or emailing customers.
  - A script is a set of instructions, called script steps.
  - Simple scripts can perform a single task. Complex scripts can combine elements (such as user feedback) with programming techniques (such as branching and looping).

# What are Scripts?

A script is a sequence of instructions that accomplish a particular task. For example, Figure 70 shows a script that can create a new contact record by performing these tasks:

- Navigating to the **Contacts** layout
- Creating a new record
- Entering default data into two fields
- Placing the cursor in the title field so the user can begin typing immediately

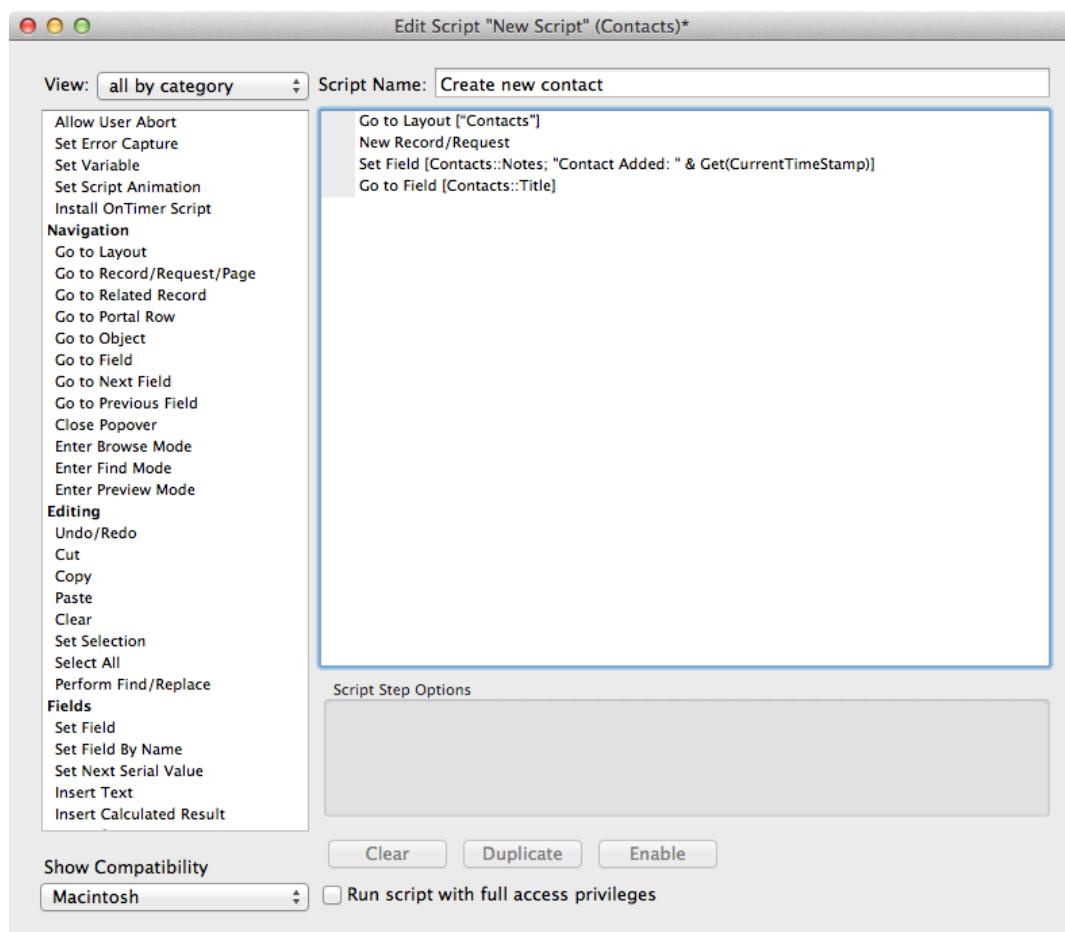


FIGURE 70

It may be helpful to think of creating a script as writing a recipe for cooking. A recipe provides instructions (measuring, chopping, mixing, stirring, and simmering) in a particular order while working with a list of ingredients to produce a desired result. Some recipes (and scripts) are simple, while others more complex and time-intensive.

## Script Steps

A script is composed of script steps. Each script step is a specific instruction of the complete script which defines the task. The script steps are pre-defined commands that you select from a list. There are more than 150 script steps that perform actions such as navigating to a layout, creating and deleting records, and performing finds.

Most script steps are based on menu items. For example, frequently used menu items such as New Record, Enter Find Mode, and Import Records are all script steps. This makes scripting easier to learn for users who are familiar with using solutions in Browse and Find mode.

# Creating and Editing Scripts

You can create, edit, and manage scripts using the **Manage Scripts** command in FileMaker Pro. If you have access privileges in the file, you can access the **Manage Scripts** window using either of these methods:

- Choose **Manage Scripts** from the **Scripts** menu.
- Use the keyboard shortcut **Command-Shift-S** in OS X or **Ctrl-Shift-S** in Windows.

An example of the **Manage Scripts** window is shown in Figure 71.

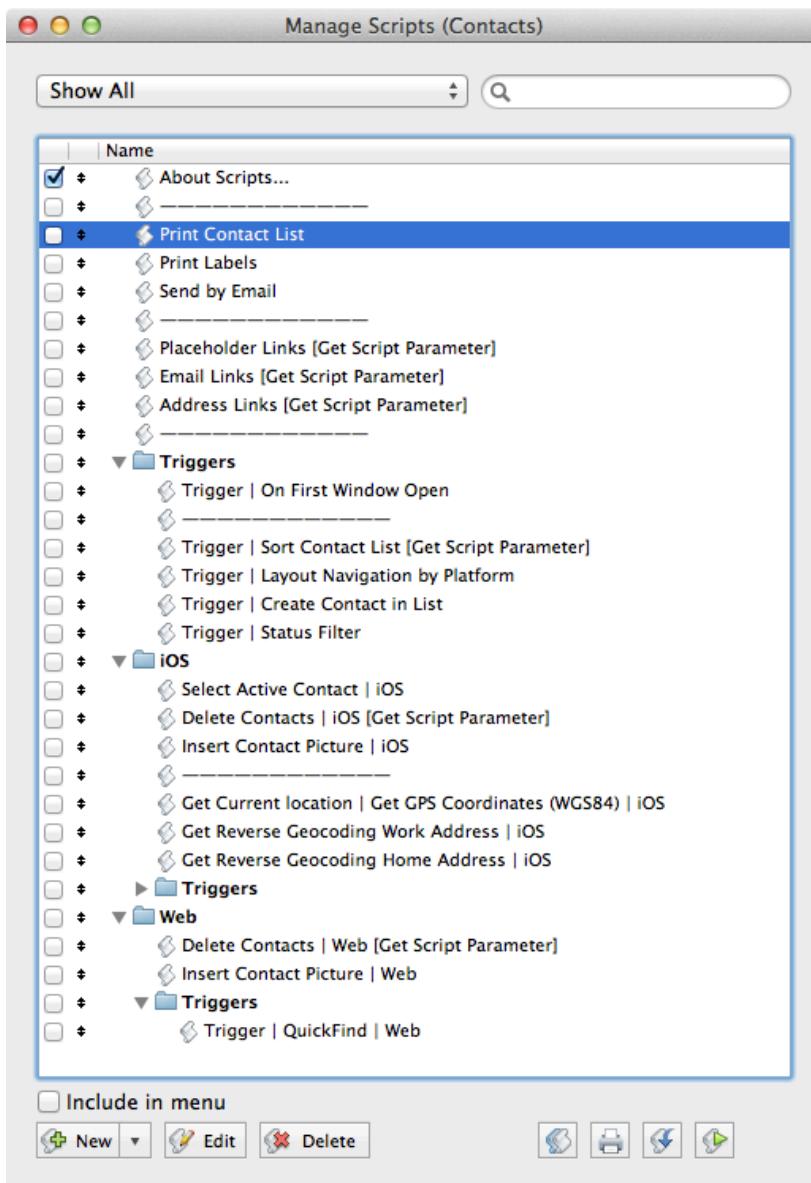


FIGURE 71

All of the scripts created for a given database file are listed in the **Manage Scripts** window. In a new file that was not created from a Starter Solution, the **Manage Scripts** window will be blank, no scripts will appear. Your job is to add scripts to automate repetitive tasks and to provide controls for users of the solution. Scripts can simplify and enhance the user experience.

## Organizing Scripts

Scripts can be organized into folders for easy grouping and retrieval. A FileMaker solution can easily contain many scripts, so keep your scripts organized to save time and effort. Two tools at the top of the Manage Scripts window allow you to easily find scripts that you have written:

- The pop-up menu in the upper left corner of the window lets you view the contents of a single folder.
- The text box in the upper right corner allows you to filter the script list. As you type in characters, only those scripts with that character string in their name will appear. The filter applies only to the folder chosen in the menu unless the **Show All** option is selected.

You can move scripts by clicking the up-down arrow icon or the script name and dragging the script to a new location.

You can delete scripts by using either of these methods:

- Use the **Delete** button at the bottom of the window.
- Press the **Backspace** or **Delete** key after selecting one or more scripts.

Be careful when you delete scripts, the delete action cannot be undone and may have serious consequences for how parts of your FileMaker solution function (or cease to function).

The checkbox to the left of each script name indicates whether that script is listed in the Scripts menu. Users can trigger these scripts directly from the menu. Usually you will list only high level control scripts in the menu, such as **Logout**, **Go to Menu**, **Login** again, and **Help**, but you can decide what makes sense for your solution.

# Writing Scripts

To create a script, click the **New** button in the **Manage Scripts** dialog. An **Edit Script** dialog opens, shown previously in Figure 70. By default, all new scripts are named "**New Script**". Script names need not be unique, but it is a best practice to make names that are unique and that describe the purpose of the script.

All of the individual script steps are listed on the left side of the **Edit Script** dialog. You can add a script step to your script using either of these methods:

- **Double-click** the script step in the list on the left.
- Select the script step, then click the **Move** button (or press **Return**).

FileMaker Pro does not limit the length of scripts or the number of steps that scripts can perform.

Not every script step is valid for every FileMaker environment. If you are writing a script intended for a FileMaker Go user, for example, limit your script to only those script steps that can be executed on iOS devices. The **Show Compatibility** option at the bottom left of the **Edit Script** dialog allows you to choose a target platform, such as iOS or FileMaker WebDirect. Script steps that are incompatible with the selected platform will be greyed out.

When a step in a script is selected, you can view and specify step options in the **Script Step Options** portion of the **Edit Script** dialog. As you learn new script steps, you will learn about the options available to you. (Options for each script step are discussed fully in FileMaker Pro online help.)

You can save a script by choosing **Save Script** from the **Scripts** menu, or by using the keyboard shortcut **Command-S** in OS X or **Ctrl-S** in Windows. You can always identify a script with unsaved changes because you will see an asterisk (\*) at the end of the script name in the title of the **Edit Script** dialog. If you try to close the **Edit Script** dialog (or run the script) before you have saved it, FileMaker Pro will prompt you to save the script.

# Triggering Scripts

After you have created a script, you must decide how and when it will be triggered.

Scripts can be triggered in many different ways in FileMaker solutions, including:

- Any object on a layout can be defined to be a button and programmed to perform a script when a user clicks it. This option is described in detail in the next section, "Buttons".
- Scripts listed in the **Scripts** menu can be triggered manually by choosing the script item from the menu (or by using a keyboard shortcut, when available).
- Scripts can be defined to run (call) other scripts.
- If you choose **File Options** from the **File** menu, you can define a script to trigger when any window opens, when the first window opens, when any window closes, and when the last window closes.
- You can define layout or object-level script triggers to run as users interact with your solution. Some examples of actions that can trigger a script are navigating to a layout, clicking or tabbing out of a field, or entering **Browse** or **Find** mode.

# Buttons

You can make most objects on a layout behave as if it were a button that triggers a script, or you can use the **Button** tool to create a button object.

To access the **Button Setup** dialog for an object shown in Figure 72, use either of these methods:

- **Control-click** (or **right-click** in Windows) the object and choose **Button Setup** from the contextual menu.
- Select the object and choose **Button Setup** from the **Format** menu.

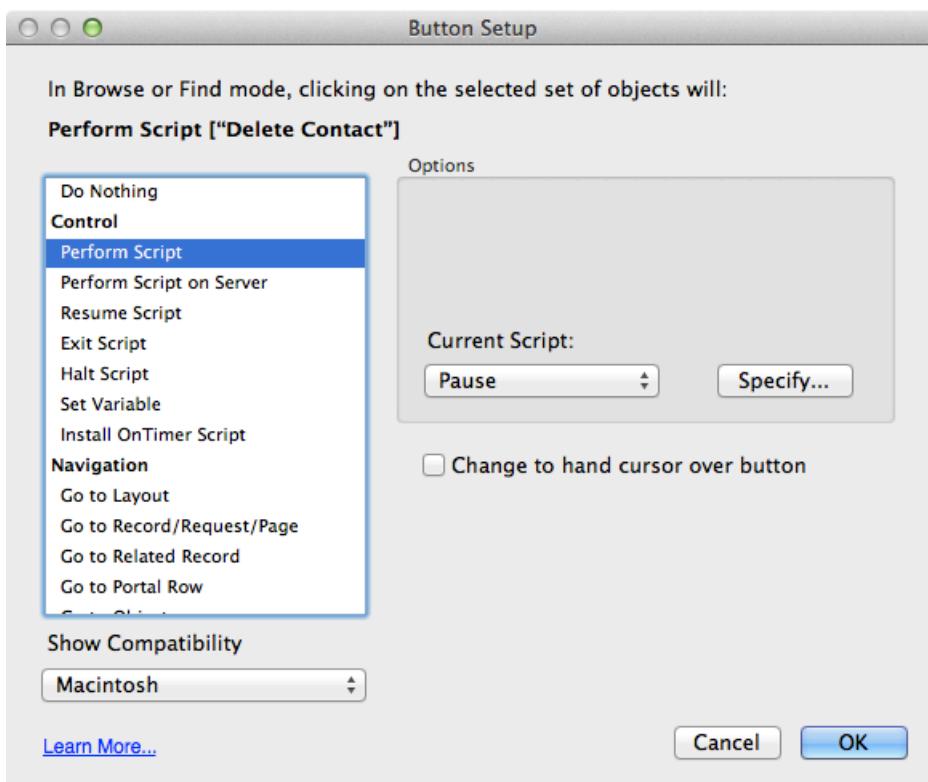


FIGURE 72

Typically in the **Button Setup** dialog, you choose **Perform Script** from the list of available script steps, then specify which script to trigger. Buttons can also perform single script steps, which can be useful for very simple navigation (for example, **Go To Layout**) or record creating.

There are a couple scripts that need to be created in the Equipment Rentals solution to make it more user friendly. The first is a script to navigate to a list of Customers from the **Customer Details** layout, and the other is a startup script to navigate to the appropriate layout upon opening the file depending on the user's device. These are examples of useful navigation features that will make it easier for users to access different areas of a solution and find specific data.

As we learned in Lesson 10: Layout Design Tools, when creating a new layout for an iOS device, FileMaker Pro will create a script that is attached to the layout as a script trigger. The script locks the zoom feature on the device, which prevents the layout from zooming in if a user accidentally **double-taps** on it. Therefore, you'll already have two scripts in the **Manage Scripts** dialog.

## Activity 15.1: Creating a Navigation Script

Create a script that will allow the user to navigate to the **Customer List** layout from the **Customer Details** layout. You will add a button to the **Customer Details** layout that performs this script.

1. Open the **Manage Scripts** dialog by choosing **Scripts > Manage Scripts...** or by using the keyboard shortcut **Command-Shift-S** (OS X) or **Ctrl-Shift-S** (Windows).
2. Click the **New** button in the lower left hand corner of the dialog. Change the name of the script to "**Go to Customer List**".
3. Double-click the **Go to Layout** script step in the list of script steps to move it into the script editing area.
4. Click on the newly added **Go to Layout** step and choose **Layout...** in the **Specify** drop-down in the lower right hand corner of the dialog.
5. Choose the **Customer List** layout and click **OK**.
6. Save the script by choosing **Scripts > Save Script** or by pressing **Command-S** (OS X) or **Ctrl-S** (Windows) and close the **Edit Script** and **Manage Scripts** windows.
7. Navigate to the **Customer Details** layout and enter **Layout mode**.
8. Select the **Button** tool ( icon) from the **Status Toolbar**. Click and drag on the layout to create a button object in the header. The **Button Setup** dialog will appear.
9. Choose **Perform Script** from the list of script steps on the left hand side.

- Click **Specify...** and choose the **Go to Customer List** script. Click **OK** and then click **OK** again to exit the **Button Setup** dialog.
- Type **Customer List** as the button text, save the layout, and enter **Browse** mode. The **Customer Details** layout should now look like Figure 73.

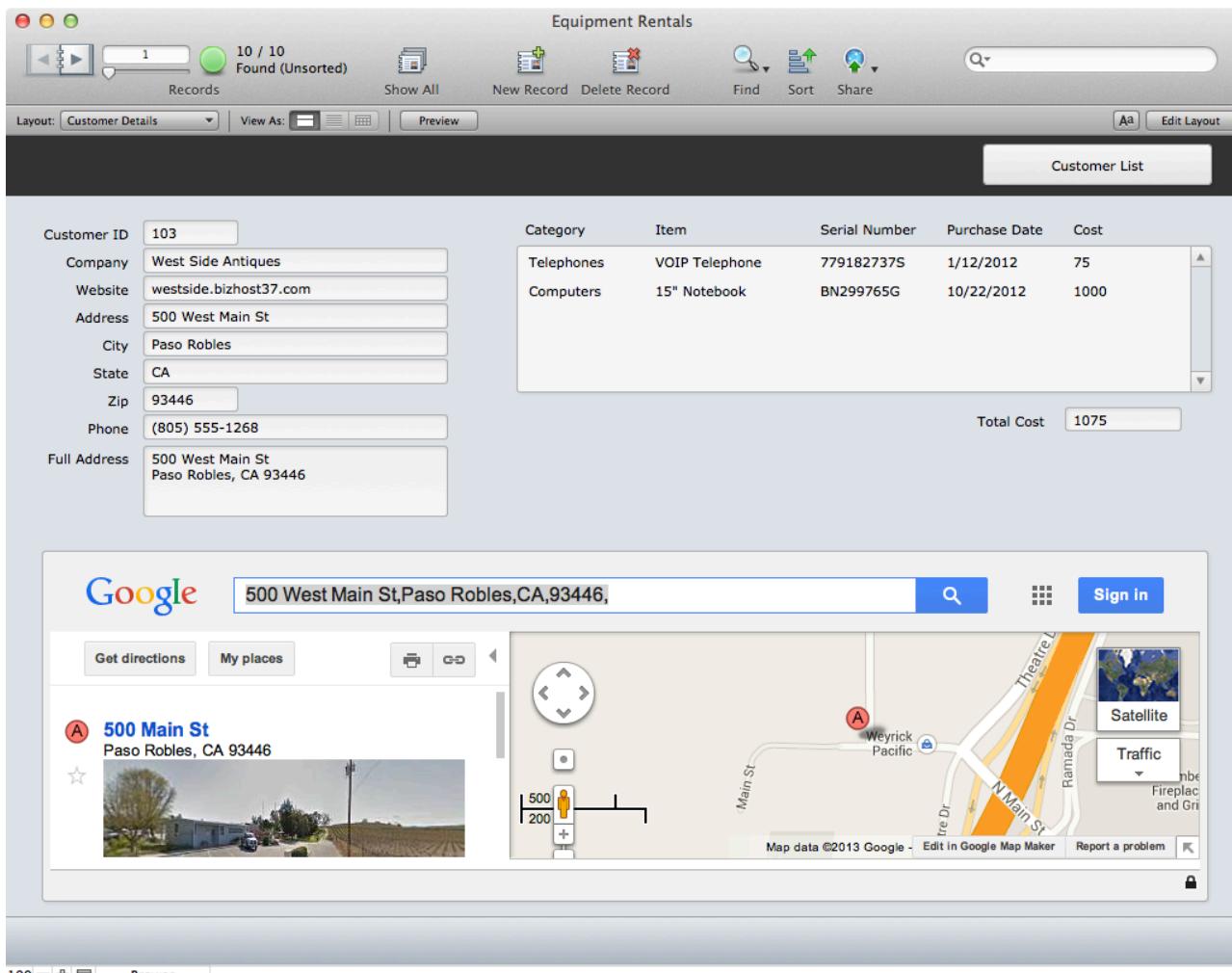


FIGURE 73

Test the button to make sure it correctly navigates to the **Customer List** layout. The current record and found set do not change when navigating to the **Customer List** using this button; it simply navigates to the **Customer List** layout and displays the same set of records.

## Single Step Scripts

Because this script only contains one script step, the same action could be accomplished by having the button execute the Go to Layout script step directly (rather than executing the Perform Script script step). Most script steps are available to be specified as a button's action in the left hand side of the Button Setup dialog. The limitation with this approach is that only one step can be specified. A script is required for a button to perform multiple script steps in a sequence. It is generally considered a best practice to define scripts for all buttons in a solution, especially if the action will be repeated in more than one location in the solution. This is helpful if you need to add a step to the process like sorting the records displayed in the list. Updating a single script would be much more efficient than reviewing your entire solution and updating all the buttons that reference a certain script step.

# Startup Script

It is useful to have a script execute when a user opens a solution. Common uses for this type of script are:

- Displaying a layout specifically designed for iOS if the user is using an iOS device
- Navigating to a different table based on the needs of different user groups.

You will explore how to use the **OnFirstWindowOpen** script trigger to accomplish this.

For the Equipment Rentals file, iOS users are mainly technicians whose responsibilities include delivering, installing, and repairing assets for customers and are only interested in working with asset records. The desktop users of the solution are the Equipment Providers, Inc.'s account managers who are more interested in viewing customers than assets because they routinely call or send letters to customers. To help these different types of users be more productive, the startup script in the Equipment Rentals solution should navigate to the appropriate area depending on the device being used.

## Activity 15.2: Creating a Startup Script

You will use a combination of the **If** script step and the **Get(Device)** function to check the user's device and have the script take different steps accordingly.

1. Open the **Manage Scripts** dialog.
2. Create a new script named **Startup**.
3. Double-click the **If** script step to add it to the script. An **End If** step is automatically added to the script because every **If** step requires an **End If** step to be considered valid.
4. Select the **If** step and click **Specify...** or double-click on the **If** step to bring up the **Specify Calculation** dialog.
5. Enter the formula **Get (Device) = 3**. The **Get (Device)** function returns 3 if the user is on an iPad.
6. Click **OK** to exit the **Specify Calculation** dialog.
7. Add a **Go to Layout** script step to the script. Place the step directly after the **If** script step but before the **End If** script step by clicking and dragging it into position.

8. Change the **Go to Layout** script step to navigate to the **Asset Details - iPad** layout.
9. Double-click the **Else If** script step to add it to the script. The **Else If** step allows you to specify another condition to evaluate if the condition specified in the **If** step is false. The **Else If** step will only be executed when the condition specified in the **If** step is false.
10. Select the **Else If** step and click **Specify...** or double-click on the **Else If** step to bring up the **Specify Calculation** dialog.
11. Enter the formula **Get(Device) = 4**. The **Get(Device)** function returns 4 if the user is on an iPhone or iPod touch.
12. Add a **Go to Layout** script step between the **Else If** and **End If** script step. Change the **Go to Layout** script step to navigate to the **Asset Details - iPhone** layout.
13. Add an **Else** script step directly after the last **Go to Layout** script step but before the **End If** script step. The **Else** script step allows you to specify what the script should do if the conditions specified in the **If** and **Else If** steps are false, meaning the user is not using an iOS device.
14. Add a **Go to Layout** script step immediately following the **Else** script step. Specify that this **Go to Layout** script step navigates to the **Customer List** layout. The script should look similar to Figure 74.

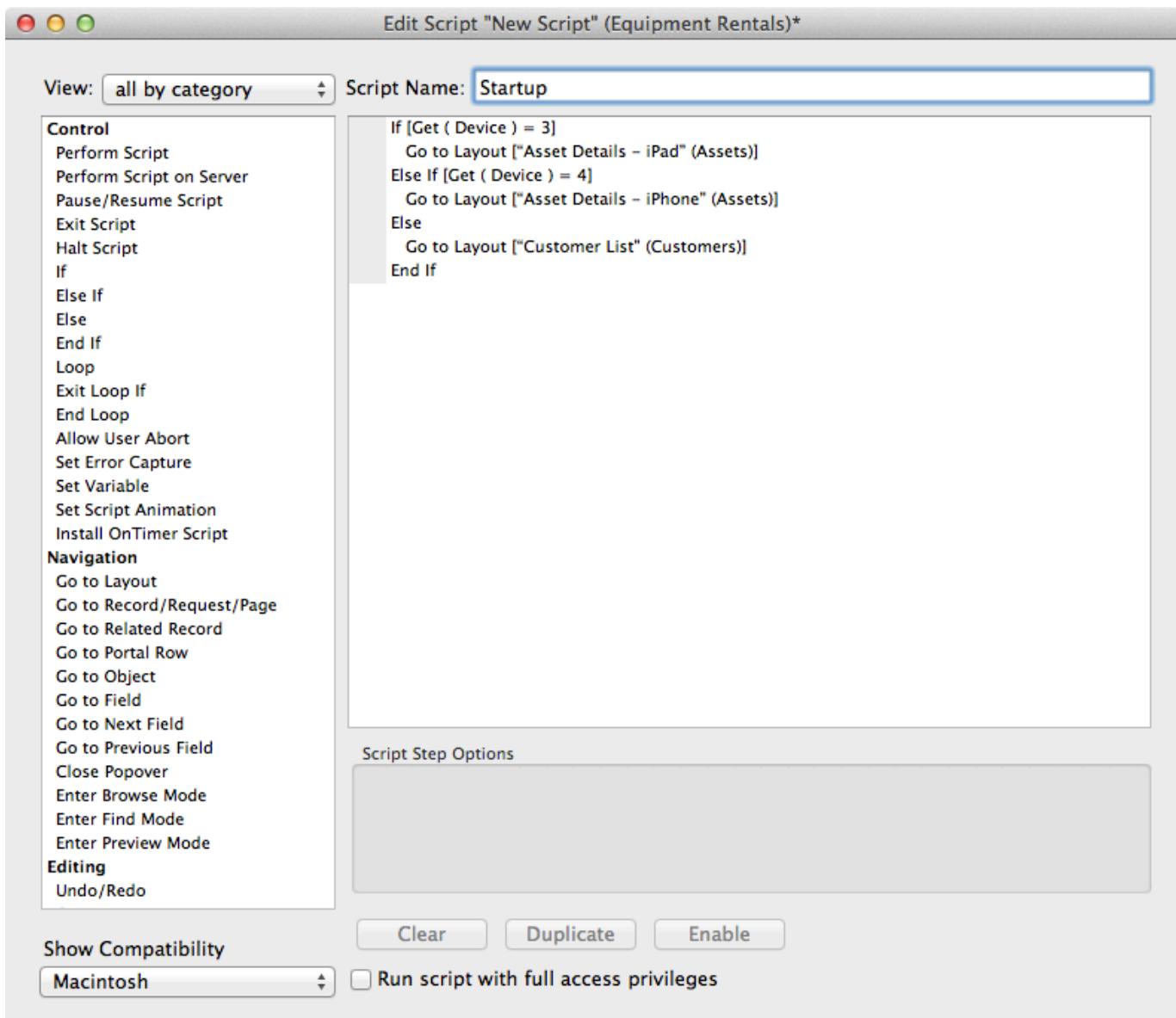


FIGURE 74

15. Save the script and close both the **Edit Script** and **Manage Scripts** dialogs.
16. Choose **File > File Options...** and go to the **Script Triggers** tab.
17. Check the box next to **OnFirstWindowOpen** and choose the **Startup** script. Click **OK** twice to close the **Specify Script** and **File Options...** dialogs.

To test the script, open the Equipment Rentals file from an iOS device. Refer to the deployment section for detailed instructions on transferring the file to an iOS device and opening the file with FileMaker Go.

If you do not have access to an iOS device, you can test that the script is executing properly on your computer by navigating to the **Asset Details - iPad** layout, closing the file, then reopening the file. FileMaker Pro's default behavior would be to open the file with the last used layout, which was **Asset Details - iPad** layout displayed in this case, but if the **Startup** script executes properly, the file will open to the **Customer List** layout instead.

## Review Questions

1. Where do a majority of script steps come from?
2. How do you configure a layout object to activate a script when the user clicks it?
3. What does the **OnFirstWindowOpen** script trigger allow developers to do?

# Answers

1. A majority of script steps come from menu items in **Browse**, **Find**, and **Preview** modes.
2. Any object on a layout can be turned into a button by using the **Button Setup** dialog, which is accessible from the object's contextual menu, or by choosing **Format > Button Setup**. Set the button to **Perform Script** and select the script you want to trigger.
3. Developers can create startup scripts to run when the solution first opens which can take users to layouts built for their needs using the **OnFirstWindowOpen** script trigger.

## **Lesson 16**

# **Reporting**

---

**Time:** This lesson takes approximately 20 minutes to complete.

**File:** Equipment Rentals.fmp12



# Objectives

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After this lesson, you will be able to:

- Describe how a subsummary report works
- Explain the concept of break field
- Set up subsummary and grand summary parts
- Define and use summary fields
- Create basic subsummary reports
- Create a chart using **Quick Charts**

One of the most powerful features of FileMaker solutions is its ability to combine data and summarize it in a report. With the right reports, you can gain insight into your business or meet your internal or regulatory compliance requirements. You can use the data to aggregate, organize, synthesize, summarize, and manage it. To create effective reports, you will need to know how to define fields, develop layouts, define calculations, and use scripts. In other words, you will need to harness the skills that you learned in previous lessons.

In this lesson, you will work with dynamic subsummary data to create a basic subsummary report. The reporting tools in FileMaker Pro are the building blocks for your most advanced reporting tasks. You will also learn how to make a chart using **Quick Charts**.

Here is what you learned about layouts from the **Getting Started Tour**.

- Getting Started > Charts
  - Create charts to compare and contrast data. You can chart individual data values (single items sold) or summary data (total sales per quarter)
- Getting Started > Reporting
  - FileMaker Pro can generate reports to help you organize and analyze your data.
  - You can create custom reports by grouping data. Summary reports can include subtotals and grand totals.
  - FileMaker Pro can print your report or email it as an Excel or PDF file.

# Subsummary Reports

Before you begin building a report, you need to plan what kind of report you want. For the Equipment Rentals file, management has asked for a report that shows the total cost of Assets per Category so they can evaluate whether investment in assets is properly diversified across the different categories.

You can generate different reports using the same interface by using different data sets. For example, a layout that summarizes Assets by Category can potentially present all Assets or only those Assets that are currently in service.

The most powerful type of report in FileMaker Pro is the subsummary report which presents a list of data grouped by a specific value. In the Equipment Rentals solution, you have the data shown in Figure 75.

Asset ID	Customer ID	Customers::Company	Item	Category	In Service ...	Purchase ...	Cost	+
86000	108	Vineyard Portraits,	Desktop PC System	Computers	1/10/2011	1/9/2011	1200	
86001	110	Rankin Studios	Espresso Machine	Appliances	2/11/2011	1/27/2011	100	
86002	107	Kristi's Auctions	Microwave	Appliances	4/20/2011	3/17/2011	150	
86003	105	Abbott Securities	Desk Chair	Office Furniture	5/18/2011	3/26/2011	50	
86004	104	Mountain Air Wine	VOIP Telephone	Telephones	5/23/2011	4/18/2011	75	
86005	109	XYZ Global	Desk Chair	Office Furniture	6/14/2011	4/23/2011	50	
86006	107	Kristi's Auctions	Digital Camera	Camera	5/20/2011	5/1/2011	300	
86007	110	Rankin Studios	Desk Chair	Office Furniture	7/13/2011	6/7/2011	50	
86008	110	Rankin Studios	Digital Camera	Camera	7/22/2011	7/8/2011	300	
86009	111	Thomas Custom	VOIP Telephone	Telephones	8/28/2011	7/15/2011	75	
86010	112	Williams Design	Microwave	Appliances	1/10/2012	11/24/2011	150	
86011	103	West Side Antiques	VOIP Telephone	Telephones	3/9/2012	1/12/2012	75	
86012	109	XYZ Global	Desktop PC System	Computers	6/9/2012	4/18/2012	1200	
86013	108	Vineyard Portraits,	VOIP Telephone	Telephones	5/21/2012	5/16/2012	75	
86014	107	Kristi's Auctions	Desk Chair	Office Furniture	8/15/2012	8/13/2012	50	
86015	103	West Side Antiques	15" Notebook	Computers	10/25/2012	10/22/2012	1000	
86016	108	Vineyard Portraits,	Desk Chair	Office Furniture	12/5/2012	10/29/2012	50	
86017	107	Kristi's Auctions	15" Notebook	Computers	12/30/2012	12/15/2012	1000	
86018	109	XYZ Global	VOIP Telephone	Telephones	2/3/2013	12/25/2012	75	
86019	112	Williams Design	VOIP Telephone	Telephones	7/16/2013	6/26/2013	75	
86020	109	XYZ Global	Espresso Machine	Appliances	8/25/2013	7/3/2013	100	
86021	104	Mountain Air Wine	Espresso Machine	Appliances	10/4/2013	8/31/2013	100	
86022	112	Williams Design	Digital Camera	Camera	10/12/2013	9/4/2013	300	
86023	105	Abbott Securities	VOIP Telephone	Telephones	10/13/2013	9/16/2013	75	
86024	106	SpinSeven Creative	15" Notebook	Computers	10/27/2013	10/9/2013	1000	
86025	110	Rankin Studios	Desktop PC System	Computers	11/17/2013	11/6/2013	1200	
86026	106	SpinSeven Creative	Desk Chair	Office Furniture	11/29/2013	11/8/2013	50	
86027	104	Mountain Air Wine	Digital Camera	Camera	12/1/2013	11/15/2013	300	
86028	104	Mountain Air Wine	Desktop PC System	Computers	12/3/2013	11/30/2013	1200	

FIGURE 75

One report you can generate from this data is a subsummary by Category as shown in Figure 76.

The screenshot shows a FileMaker Pro report window titled "Equipment Rentals". The top menu bar includes "File", "Edit", "View", "Layout", "Find", "Sort", "Share", and "Help". The toolbar contains icons for Records, Show All, New Record, Delete Record, Find, Sort, Share, and a search field. The layout is set to "Asset Report" and "Preview".

**Asset Report**

Asset ID	Item	Purchase Date	In Service Date	Cost
<b>Appliances</b>				
86001	Espresso Machine	1/27/2011	2/11/2011	\$100.00
86002	Microwave	3/17/2011	4/20/2011	\$150.00
86010	Microwave	11/24/2011	1/10/2012	\$150.00
86020	Espresso Machine	7/3/2013	8/25/2013	\$100.00
86021	Espresso Machine	8/31/2013	10/4/2013	\$100.00
<b>Appliances</b>				<b>\$600.00</b>
<b>Camera</b>				
86006	Digital Camera	5/1/2011	5/20/2011	\$300.00
86008	Digital Camera	7/8/2011	7/22/2011	\$300.00
86022	Digital Camera	9/4/2013	10/12/2013	\$300.00
86027	Digital Camera	11/15/2013	12/1/2013	\$300.00
<b>Camera</b>				<b>\$1200.00</b>
<b>Computers</b>				
86000	Desktop PC	1/9/2011	1/10/2011	\$1200.00
86012	Desktop PC	4/18/2012	6/9/2012	\$1200.00

11/13/2013

100

FIGURE 76

As you can see, this kind of report groups all the assets under a subheader for each category. Additionally, you can include a row at the bottom of each category that displays the total cost of assets in that category using a summary field.

When creating a subsummary report, the field used to group records is called the *break field*. In this example, **Category** is the break field. Typically, the break field is a field that contains repeating data across multiple records—such as category, type, status, and month—rather than a continuous or free entry field like amount, description, and comment. Whenever the break field value changes, the report "breaks" and starts a new subsummary group.

Unlike creating layouts that require you to use the **Field Picker**, FileMaker Pro walks you through creating a report, including adding fields and adding subtotals and totals.

## Subsummary Parts

To group records, you need to use a subsummary part. A subsummary part is a layout part that displays information for each group of records when the found set is sorted by the break field specified in the part definition for the subsummary part. The subsummary part and its contents are not displayed if the found set is not sorted by the break field.

It is often useful to have two subsummary parts on a layout, one above the body and one below the body, with the same break field. This allows you to display a descriptive header for each group as well as a total or other aggregated data below the group.

Figure 76 illustrates this approach. The header is the Category, and the aggregated data is the total cost of assets per Category.

You can also have many subsummary parts on a layout with different break fields specified. This is useful for displaying subgroups within groups. As long as you include the different break fields in your sort order, the records will be grouped by each break field.

Using multiple subsummary parts on a single layout can also be useful for reusing your report layout to create reports that are grouped by different fields. Because subsummary parts are only displayed when the found set is sorted by the part's break field, all you would need to do to change the grouping on the report is sort the found set by a different break field.

## Summary Fields

Grouping records becomes more valuable when you utilize summary fields to aggregate data for each group. A summary field aggregates data across a group of records.

Summary fields are created via the **Manage Database** dialog. You can choose options for summary fields through the **Options for Summary Field** dialog as shown in Figure 77. The most common summary operations you will use are **Total**, **Average**, and **Count**.

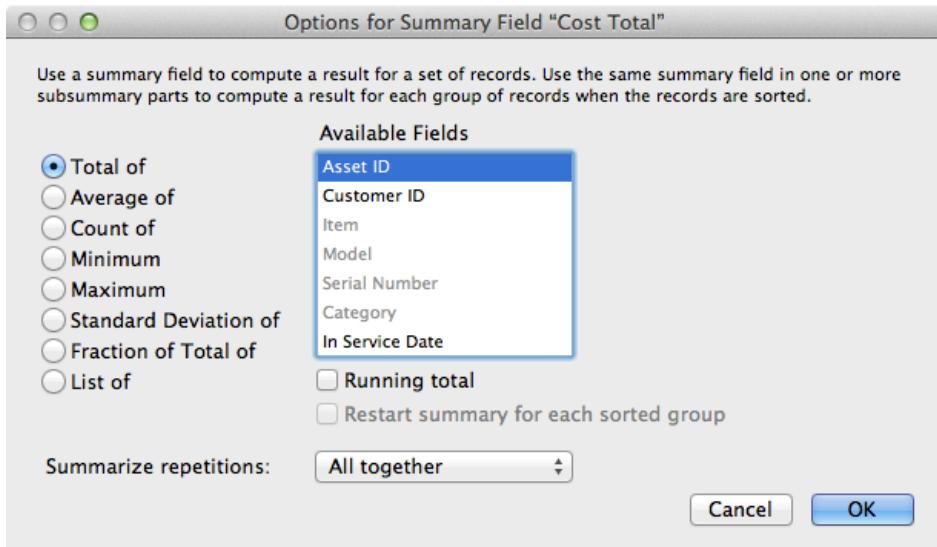


FIGURE 77

When a summary field is placed in a header, footer, body, or grand summary part, it aggregates the values from a specified field across all records in the found set. When a summary field is placed in a subsummary part, it displays aggregate information about each subgroup of records. This means you can use the same summary field to total the cost of assets for each category in a subsummary part, and also to total the cost of all assets in the found set in a grand summary part.

## Activity 16.1: Creating a Subsummary Report

1. Go to **Layout** mode and choose **Layouts > New Layout/Report....**
2. Choose **Assets** in the **Show records from** drop-down and name the new layout "**Asset Report**".
3. Click on **Computer** and then choose **Report**. Click **Continue**.
4. Make sure the options to include subtotals and grand totals are activated and click **Next**.
5. Double-click on the following fields from the Assets table to specify them for the report:
  - Asset ID
  - Item
  - Purchase Date
  - In Service Date

- Cost
  - Category
6. Click **Next**.
7. Double-click on **Category** in the Organize Records by Category screen. Click **Next**.
8. Double-click on **In Service Date** to also sort by that field in addition to **Category**. Your screen should look like Figure 78, then click **Next**.

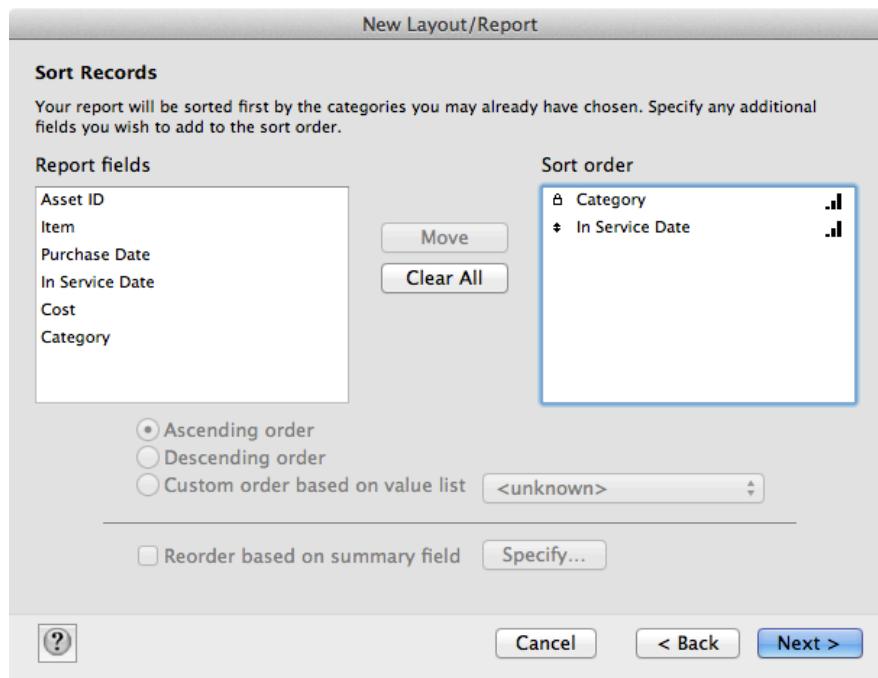


FIGURE 78

9. Under Summary field, click **Specify...**. You have not yet created a summary field.
10. Click **Add**. Name the field **Cost Total**, choose **Total of** from the options on the left side of the dialog, and choose **Cost** from the field names.
11. Click **OK** to create the field and click **OK** again to choose the newly created field.
12. Click **Add Subtotal** and click **Next**.
13. On the **Specify Grand Totals** screen click **Specify...**, choose **Cost Total**, and click **OK**.
14. Click **Add Grand Total** and click **Next**.

15. On the **Header and Footer Information** screen, choose **Layout Name** in the drop-down for **Top left** and **Current Date** in the drop-down for **Bottom right**. Click **Next**.
16. Click **Create a script**, name it "**Asset Report**", and check the **Run script automatically** checkbox. This will add an **OnLayoutEnter** Script Trigger so that when a user goes to the **Asset Report** layout, the script will automatically sort the records. Click **Finish**.
17. Remove the **Category** field from the Body, along with its label in the Header.

A new layout will be created with the fields, subsummary parts, and the trailing grand summary that you specified. The process will do its best to properly size fields, but some adjustment might be needed. After resizing and moving fields, and applying the **Vibrant** theme and data formatting, your report should look similar to Figure 79. Note that after exiting **Layout** mode you may need to run the **Asset Report** script by choosing **Scripts > Asset Report** in order for the report to be grouped correctly. Notice that the **Category** field has been removed from the body part in Figure 79. Since the report will always sort, it is unnecessary to show the Category on each row.

Asset Report				
Asset ID	Item	Purchase Date	In Service Date	Cost
<b>Appliances</b>				
86001	Espresso Machine	1/27/2011	2/11/2011	\$100.00
86002	Microwave	3/17/2011	4/20/2011	\$150.00
86010	Microwave	11/24/2011	1/10/2012	\$150.00
86020	Espresso Machine	7/3/2013	8/25/2013	\$100.00
86021	Espresso Machine	8/31/2013	10/4/2013	\$100.00
				<b>Appliances</b> \$600.00
<b>Camera</b>				
86006	Digital Camera	5/1/2011	5/20/2011	\$300.00
86008	Digital Camera	7/8/2011	7/22/2011	\$300.00
86022	Digital Camera	9/4/2013	10/12/2013	\$300.00
86027	Digital Camera	11/15/2013	12/1/2013	\$300.00
				<b>Camera</b> \$1200.00
<b>Computers</b>				
86000	Desktop PC	1/9/2011	1/10/2011	\$1200.00
86012	Desktop PC	4/18/2012	6/9/2012	\$1200.00

FIGURE 79

After performing a find on any layout based on Assets, running the **Asset Report** script by choosing **Scripts > Asset Report** will take you to the report layout with the same found set and sort the data. This allows you to reuse the report with any found set.

# Charts

Visual displays of information are often easier to understand than written versions of the same information. For example, charts can help illustrate changes in prices over time, the relative performance of a group of students, and much more.

There are two ways to create charts in FileMaker Pro. The first method, using the **Quick Chart** feature, gives users the ability to chart their data in just a few minutes. The second method offers greater flexibility and involves placing a chart object on a layout and manually defining the data series to be rendered. You can move, resize, and manipulate a chart object just as you do other layout objects, and you can customize the colors, fonts, and backgrounds of a chart. When using FileMaker Go and FileMaker WebDirect, charts can be viewed but not created or edited.

In FileMaker Pro, you can create ten types of charts: column, stacked column, positive/negative column, bar, stacked bar, line, area, pie, scatter, and bubble. Over time, you will learn which types of charts are best for different types of data, so you can communicate your data more effectively.

## Quick Charts

The easiest way to familiarize yourself with the charting features of FileMaker Pro is to experiment with **Quick Charts**. **Quick Charts** can be created from any layout in **Browse** mode. They are based on the current found set and the current sort order, so check both before you generate a **Quick Chart** to make sure they contain the data you want to use.

### Activity 16.2: Creating a Quick Chart

You will create a **Quick Chart** that shows the number of Assets per Category for the found set.

1. Go to the **Asset Details - iPad** layout.
2. Click **Show All** in the **Status Toolbar** if you aren't showing all records.
3. Sort the data by the **Category** field.
4. Right-click in the **Category** field and choose **Chart by Category....** The **Chart Setup** dialog will appear, as shown in Figure 80.

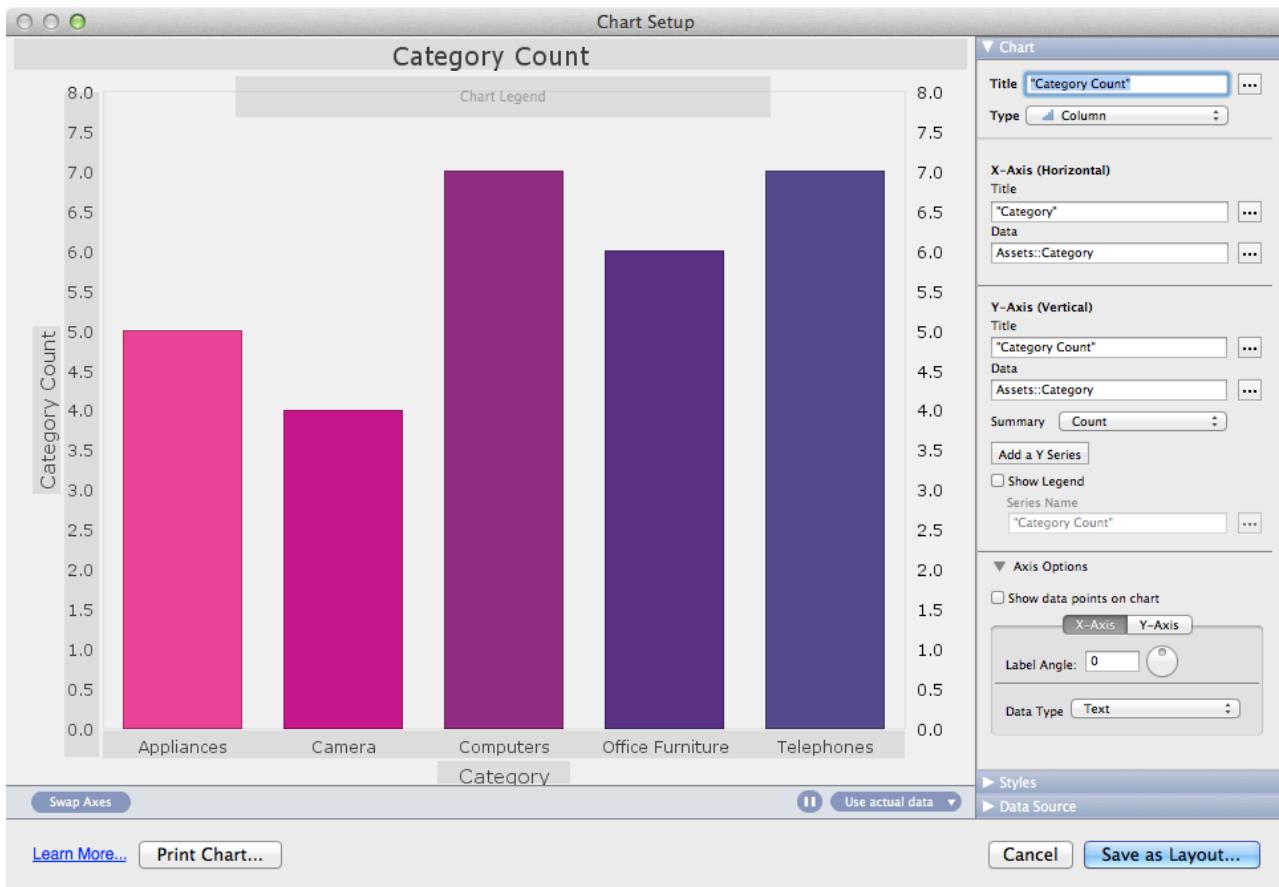


FIGURE 80

5. Change the **Title** of the chart to "**Assets By Category**".
6. Click on the **Styles** panel and change the **Chart Style** to **Shaded - 3D**.
7. Click the **Save as Layout...** button to save the chart as a new layout.
8. Name the new layout "**Assets By Category**" and click **OK**.

The newly created chart layout will automatically appear in a new window. Note that FileMaker Pro automatically creates a script with the same name as the layout and assigns it to the **OnLayoutEnter** script trigger for the new layout. It is necessary to sort your found set by **Category** in order to display the chart and the script takes care of that for you.

## Review Questions

1. What is a break field, and how do you use it to define a subsummary part?
2. How do you add a new subsummary part to a layout?
3. Name the three common summary operations, and explain what results they return for a group of records.
4. When does a subsummary part appear in **Browse** mode?
5. What FileMaker product allows you to create **Quick Charts**?
6. Which FileMaker products can you use to view charts?

# Answers

1. Use a break field to divide a found set of records into groups. When you create a subsummary part, you specify the break field. When the records are sorted by the break field and the value of the break field changes, the report "breaks" by displaying a subsummary and starting a new subsummary group.
2. To add a subsummary part to a layout, go to the **Layouts** menu, then choose **Part Setup** to use the **Part Setup** dialog. Create the new part, then define the option to be **Sub-summary when sorted by**. Choose the break field you want from the list of fields in the **Part Definition** dialog.
3. The most common summary field operations are to total, count, or average the values from a particular field. **Total** adds the values for all records in the specified field; **Count** lists the number of records that contain a value in the specified field; and **Average** finds the average for all the values in the specified field—in other words, empty records are not included. For a set of five records that contain field values of 100, blank, 200, 300, and 200, the total is 800, the count is 4, and the average is 200.
4. A subsummary part appears only when you sort records by the field you define as the break field for the subsummary part.
5. Only FileMaker Pro can be used to create **Quick Charts**.
6. FileMaker Pro, FileMaker Go, and FileMaker WebDirect can all view charts.

## Lesson 17

# Integration

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**Time:** This lesson takes approximately 20 minutes to complete.



# Objectives

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**After this lesson, you will be able to:**

- **Export data in common formats**
- **Save layouts to PDF**
- **Describe the differences between FileMaker's ODBC options**

The FileMaker Platform uses industry standards to allow it to share information with other technologies, whether FileMaker is the data source or looks to other sources. FileMaker's comprehensive integration services include:

- Importing from common file formats such as Excel and comma- or tab-separated
- Importing from XML, ODBC or Bento data sources
- Exporting to common formats such as Excel, comma- or tab-separated text, XML and HTML
- Saving data to PDF files and appending data to existing PDF files
- Live connection to SQL data sources (Oracle, MySQL, Microsoft SQL Server)
- Using ODBC/JDBC to access other data sources
- Serving as ODBC and JDBC data sources
- Accessing the source code of web pages
- Supporting HTML5 via the Web Viewer
- Authenticating with Active Directory and Open Directory
- Supporting plug-ins to extend functionality

FileMaker may also initiate and steer activity in the local operating system with:

- Support for AppleScript on OS X and the ability to launch a VBScript file on Windows OS.
- The ability to send email, dial phones, and generate event commands to local applications (such as to bring other applications to the foreground).

- Support for custom URL protocols to open FileMaker files, pass variables to and run scripts in
- FileMaker files on all platforms, and to allow interaction with other applications and apps (for instance to use the TAPI protocol to dial phones on Windows, and to interact with barcode scanners in iOS).

Here is what you learned about layouts from the **Getting Started Tour**.

- Getting Started > Exporting Records
  - You can export data to another FileMaker Pro file or to another file format, such as Microsoft Excel.
  - FileMaker Pro exports a copy of your data, leaving the original data in the database.

# Sharing Data With Outside Users

The FileMaker Platform provides many options for sharing data with other people without access to FileMaker. You can export data to multiple file formats. One popular example is exporting mailing address data share with colleagues. FileMaker Pro also allows you to share by creating a PDF of your layouts. This can be used to generate data driven communication like letters, invoices, or estimates. You can even save records as Microsoft Excel files with a single command.

## Exporting Records

FileMaker Pro enables you to export data to other file formats, allowing data from a FileMaker solution to be viewed in other applications. The supported export file formats are:

- FileMaker Pro (.fmp12)
- HTML table (.html)
- Merge (.mer)
- Microsoft Excel (.xlsx)
- Tab-Separated Text (.tab or .txt)
- Comma-Separated Text (.csv or .txt)
- XML (.xml)
- dBase format (.dbf)

There are two commands in the **File** menu to export data:

- **Export Records** - select which fields to export and the file format.
- **Save/Send Records As** - automatically exports the fields on the current layout to either a PDF or Excel file.

Both methods export the current found set, which is useful for exporting a specific data set after performing a find, such as all active clients or current month orders.

## Activity 17.1: Using Export Records

In this example you will export a HTML table of customer addresses for a direct mail service.

1. Navigate to the **Customer Details** layout and click **Show All Records** in the **Status Toolbar**.
2. In the **File** menu, choose **Export Records....**
3. Name the file “**Customer Export**” and choose the **Desktop** as the save location.
4. In the **Type** pop up menu, choose **HTML Table** and click **Save**.
5. In the **Specify Field Order for Export** dialog, move the **Company, Address, City, State, and Zip** fields to the **Field export order** box on the right, as shown in Figure 81, by **double-clicking** each field or selecting the field on the left and clicking the **Move** button.

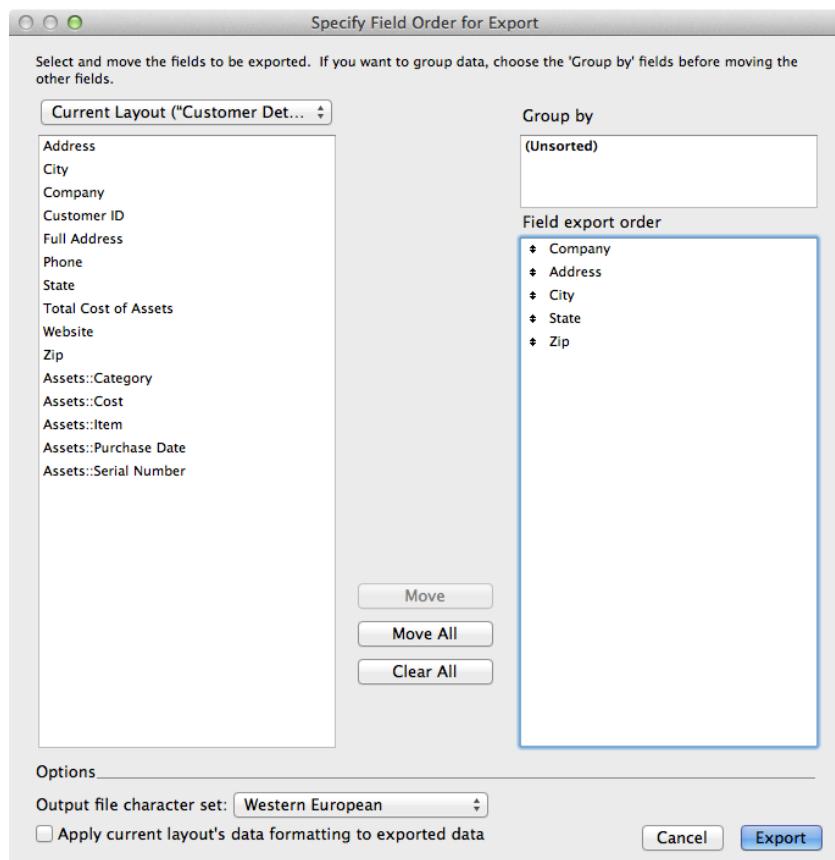


FIGURE 81

6. Click the **Export** button and open the newly created Customer Export.htm file to verify the results.

## Saving as a PDF

FileMaker Pro has built-in functionality for saving data as Adobe® PDF files. A user can create a PDF file that matches the current layout's printed output and can easily be shared with stakeholders. To do this, go to the **File** menu and select **Save/Send Records As > PDF...**

There are many options available when saving data as a PDF file, including the ability to specify the creator, title, and keywords, and to password protect the file. You can also choose to create a new email with the file attached and/or set the file to automatically open after saving. Using a script, you can also append new pages to an existing PDF.

# Integrating with Other Data Sources

Integrating a FileMaker solution with external systems can enhance the value of a solution and extend its capabilities. Sometimes it may be necessary to retrieve data from or send data to an external system. It may be that there is an existing system that serves a specific purpose well but FileMaker Pro is used for the majority of the workflow and reporting for your workgroup. Or perhaps the external system is the database for a publicly accessible website and FileMaker Pro better suits the needs of your workgroup.

# What is ODBC?

You have seen how to incorporate the Web in a FileMaker Pro solution but what if you need to import data from another system or have your FileMaker solution serve as the data source for another application? To do this, you will need to utilize the ODBC capabilities of the FileMaker platform. Open Database Connectivity (ODBC) is the technology that allows FileMaker Pro to access data from external data sources as well as act as the data source for another system.

For the most part, the ODBC data sources FileMaker Pro can connect to use the SQL database language but ODBC can be used to connect to other data sources as long as a compatible ODBC driver is available and installed on your computer and the proper Data Source Name (DSN) is set up.

Examples of database applications FileMaker Pro can connect to using ODBC include (but are not limited to) Microsoft SQL Server, MySQL, Oracle, and Microsoft Access.

There are three different ways to interact with an ODBC data source: External SQL Sources (ESS), Importing from an ODBC data source, and the Execute SQL script step. The following sections will cover the basics of these three methods.

## External SQL Sources (ESS)

ESS is a feature that allows you to add tables from remote SQL sources directly to the **Relationships Graph** in FileMaker Pro and work with them as though they were native FileMaker tables. Your users can search for, create, edit, and delete records in the SQL data table directly. You can also create direct relationships between FileMaker tables and SQL tables and view live SQL data alongside FileMaker data.

When using the ESS feature in files hosted via FileMaker Server, it is possible to configure ODBC drivers and DSNs only on the server machine, rather than on each individual desktop running FileMaker Pro. The seamless integration of the SQL table into FileMaker Pro and the consolidation of the ODBC driver and DSN setup to the server machine make ESS the preferred method of integrating with SQL data sources.

ESS is limited to Oracle, MySQL and Microsoft SQL Server. Consult the FileMaker website for more information, including appropriate drivers.

## Import from ODBC Data Sources

Importing records from an ODBC data source is a one-way form of integration between the ODBC data source and your FileMaker Pro database. Using this technique, there is no way to edit the data that exists in the ODBC source. After importing the data into FileMaker Pro it is possible to edit the data, but the changes will not be reflected in the original data source.

Unlike ESS, this import capability will work with any ODBC data source for which you can access an appropriate driver, allowing FileMaker Pro to interact with a wide variety of ODBC-based data sources.

To import records from an ODBC source, you will need to have the appropriate ODBC driver installed on each computer from which you intend to use the feature, as well as an appropriate DSN configured on each machine. This is unlike the ESS feature that permits the consolidation of drivers and DSNs onto the server alone.

## Execute SQL Script Step

The **Execute SQL** script step allows a FileMaker Pro solution to send SQL statements to a remote SQL data source. In some ways, it is the mirror image of the ODBC import functionality. While the ODBC import capability can search for and import records, but not change data in the ODBC data source, the Execute SQL script step can run commands that change data in the ODBC data source, but cannot retrieve and display records within FileMaker Pro. The two features used together can thus provide a full, two-way integration with an ODBC data source.

This feature, like the ODBC import feature, relies on ODBC drivers and DSNs installed on each FileMaker Pro client computer and will work with a very wide variety of ODBC drivers and data sources. The **Execute SQL** script step requires knowledge of SQL to apply effectively. ESS allows users to search for, create, edit, and delete records in a SQL data table directly without writing any SQL.

## Review Questions

1. What are the two ways to export data out of your solution?
2. What file formats can **Save/Send Records As...** produce?
3. What are the major benefits to using ESS (External SQL Sources) over the other ODBC techniques?

# Answers

1. Two ways to export data out of your solution are **Export Records** and **Save/Send Records As....**
2. The file formats **Save/Send Records As...** can produce Excel and PDF.
3. ESS allows users to search for, create, edit, and delete records in a SQL data table directly without writing any SQL. Also FileMaker Server can manage the connection, therefore removing the need to install ODBC drivers on multiple devices, and allowing FileMaker Go and FileMaker WebDirect clients to view data from the SQL source.

## **Lesson 18**

# **Security**

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**Time:** This lesson takes approximately 20 minutes to complete.



# Objectives

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**After this lesson, you will be able to:**

- Explain the purposes of accounts, passwords, and privilege sets
- Enable and disable the default login account
- Create and manage accounts and privilege sets
- Explain how external authentication works and why it is useful
- Articulate the purpose of the reauthentication extended privilege

Security is a primary concern for both developers and end users. It governs whether or not a person can open a given file and determines which functions and data are accessible.

This lesson will introduce you to FileMaker Platform's built-in security. You will incorporate many different aspects of FileMaker security into the Equipment Rentals file.

Depending on your security compliance and certification requirements, there may be other features that you will need to learn beyond what is covered here.

When securing a solution there are three principles to consider:

- Confidentiality — You have a responsibility to ensure that unauthorized people cannot access the data.
- Integrity — You have a responsibility to allow authorized users to create and update data while preventing unintentional changes. You must also restrict access to unauthorized users who may tamper with the files.
- Availability — You have a responsibility to ensure that the data is available to users when it is needed.

The FileMaker security model is based on two key components:

1. Accounts — identifies the individual user
2. Privilege Sets — defines access limits for user(s)

In this lesson, you will learn about these two key components.

# Prompt for Login

The first step when dealing with security is to change the default login settings configured automatically when you create a new FileMaker Pro file. By default, a new FileMaker Pro file contains an account named **Admin**, with no password, assigned to the **[Full Access]** privilege set. The file is configured to automatically login with this account. The **Full Access** privilege set allows unrestricted access to the file, including all development functions. As long as this default login remains in place, security is effectively bypassed.

## Activity 18.1: Enable Security settings

The Equipment Rentals file currently has the default security settings. Change the default settings to prompt users for a password, and give the Admin account a password.

1. Choose **File > File Options...** and uncheck the **Log in using** checkbox (Figure 82).

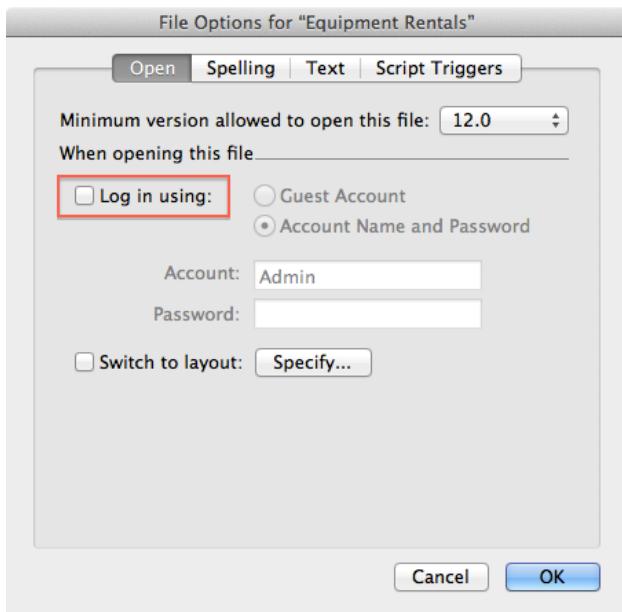


FIGURE 82

2. Click **OK**. The automatic login behavior is now disabled. The next required step in securing the file is to enter a password for the Admin account.
3. Choose **File > Manage > Security...** to open the **Manage Security** dialog, shown in Figure 83.

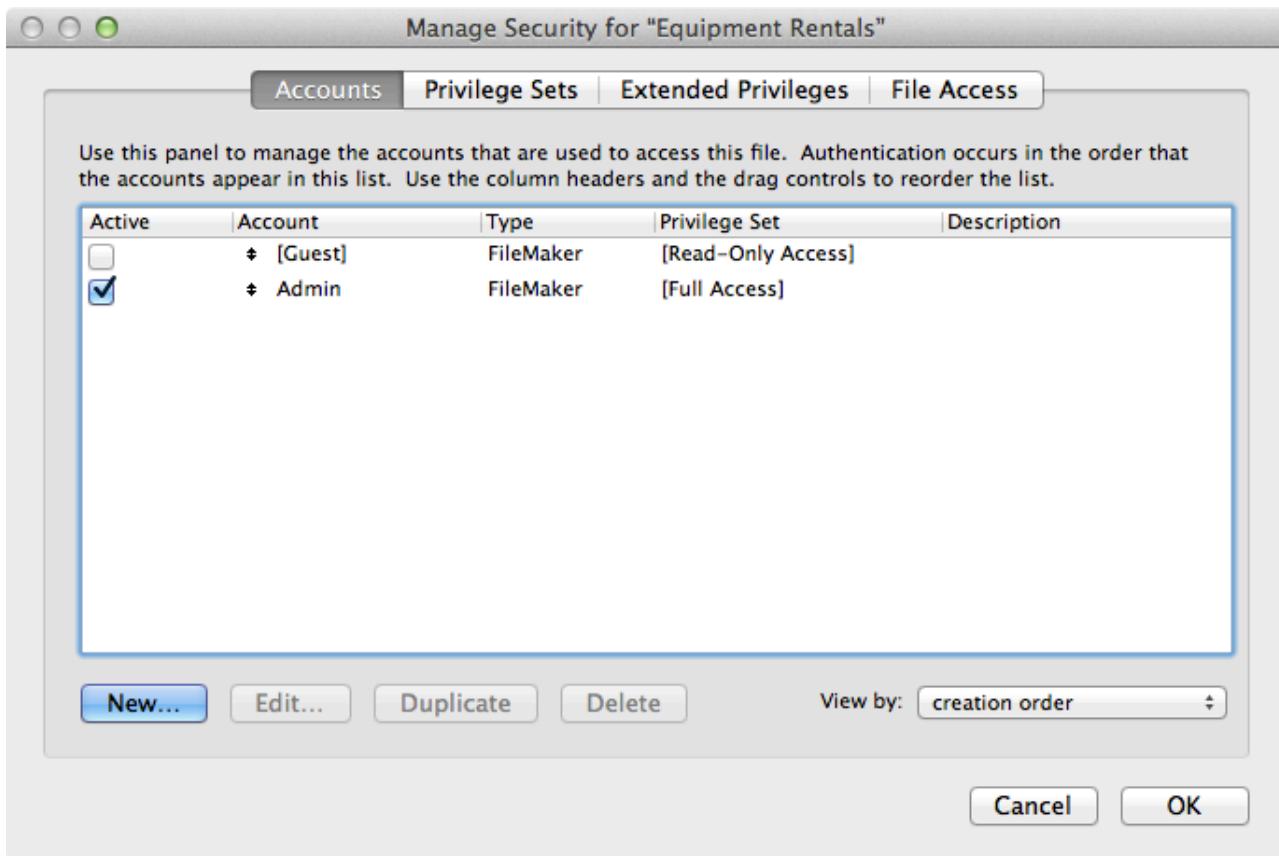


FIGURE 83

4. **Double-click** the Admin account in the list of accounts.
5. Enter **abcde** for the password and click **OK**. Click **OK** again to close the **Manage Security** dialog.
6. On the **Confirm Full Access Login** dialog, enter **Admin** as the full access account and **abcde** as the password and click **OK**.

To test these changes, close and reopen the file. You should now be prompted to login when you attempt to open the file. Keep admin passwords in a secure place. If they are lost, you may not be able to gain full access to the file again. Note that passwords are case sensitive but account names are not.

# Accounts

An account and password combination is the primary means of authenticating a user and is required to access any FileMaker solution. You can create as many accounts in your FileMaker solution as necessary and each account is given specific access privileges by assigning it to a privilege set.

Accounts can be authenticated either internally or externally. With internal authentication (via FileMaker), the account name and password are stored within the database file itself.

One of the benefits of using internal authentication is that all of the security setup in a solution can be done exclusively in FileMaker Pro without the need for an external server or FileMaker Server software. This makes it the quicker and easier option for managing accounts.

With external authentication (often via Open Directory or Active Directory) FileMaker only stores user group names and interacts with an external server to authenticate a user's account and password. External authentication requires that the database is hosted with FileMaker Server and that FileMaker Server be configured to allow external authentication (enabled by a single checkbox in the FileMaker Server Admin Console).

External authentication still requires a user to provide an account name and password, but instead of FileMaker Server verifying those credentials itself, it passes the credentials are passed through to the directory service. The directory service verifies the user's credentials and sends back a list of all the groups to which the user belongs. This list is then compared to the group names in your FileMaker file, and the first valid match determines the privilege set available to the user.

One of the benefits of external authentication is that you do not need to set up individual user credentials in every FileMaker file in your solution. The solution access can be centrally managed using the same tools most organizations have in place for granting access to other network services. This can save you a lot of time if your solution contains many FileMaker files.

Another benefit is that users do not have to memorize solution-specific credentials. The same credentials that give them access to their other company systems also give them access to the databases that they need to access.

It is common practice to have an account for each user, whether the account information is stored internally or externally. This is useful because it allows you to track who is creating or modifying individual records or taking other actions in your solution. You can accomplish this using auto-enter field settings or by using the **Get(AccountName)** function in calculations and scripts. The functionality to track this information works the same with both internal and external authentication.

# Privilege Sets

A privilege set is a specific set of rights given to one or more accounts to access certain parts of your system, such as data, layouts, fields, and scripts. By default, a new FileMaker Pro file contains three predefined privilege sets:

- **Full Access**—Allows users to have complete access to the file, including all development functions (which are required for access to the **Manage Database** and **Manage Security** dialogs).
- **Data Entry Only**—Allows users to create, edit, and delete records and to import and export data. Users cannot access any development functions.
- **Read-Only Access**—Allows users to view and export record data. Users cannot modify the file.

Developers and administrators of a database are usually given accounts associated with the **[Full Access]** privilege set. **[Full Access]** privileges are required to access the **Manage Database** and **Manage Security** dialogs, and no other privilege set can be configured to grant these abilities.

You cannot change or delete these predefined privilege sets, except to assign extended privileges. You can, however, create new privilege sets to meet your specific requirements.

A privilege set can be used by any number of accounts. Typically one account is created for each user, and a privilege set for each user group. User groups could be defined as the different departments that use a solution (Sales, Accounting, Marketing, etc.) or a hierarchy of positions within a company (Staff, Managers, Executives, etc.) for example.

**Privilege Sets** comprise the following access options:

- **Data Access and Design Privileges**—Provide access to a wide range of security control, including records, layouts, value lists, and scripts.
- **Extended Privileges**—Determine the data access methods that are permitted for a privilege set.
- **Other Privileges**—Allow printing, exporting, and some other functions.

One noteworthy feature of the **Data Access** and **Design** privileges is the ability to define privileges for specific tables, fields, layouts, scripts, and value lists by using the **Custom Privileges...** option. You can even use a calculation formula to determine record access privileges. For example, you could allow a user to edit only records assigned to him or her based on the user's account name. Using calculations for record level privileges is covered in more detail in FileMaker Training Series: Advanced, Module 7 (Security).

Up until this point, the Equipment Rentals file only has the default accounts and privilege sets. In this task you will create a new privilege set and then create a new account assigned to the new privilege set. The requirements state that the users of the solution will need to be able to edit all Asset data but only view Customer data. They should not be able to delete records in any table. The users will not be doing any layout design or scripting. They will also need remote access to the file since it will be hosted on a server.

## Activity 18.2: Creating Accounts and Privilege Sets

1. Open the **Manage Security** dialog by choosing **File > Manage > Security...**
2. Select the **Privilege Sets** tab and click **New...**
3. In the **Edit Privilege Set** dialog, name the privilege set "**Technicians**", shown in Figure 84.

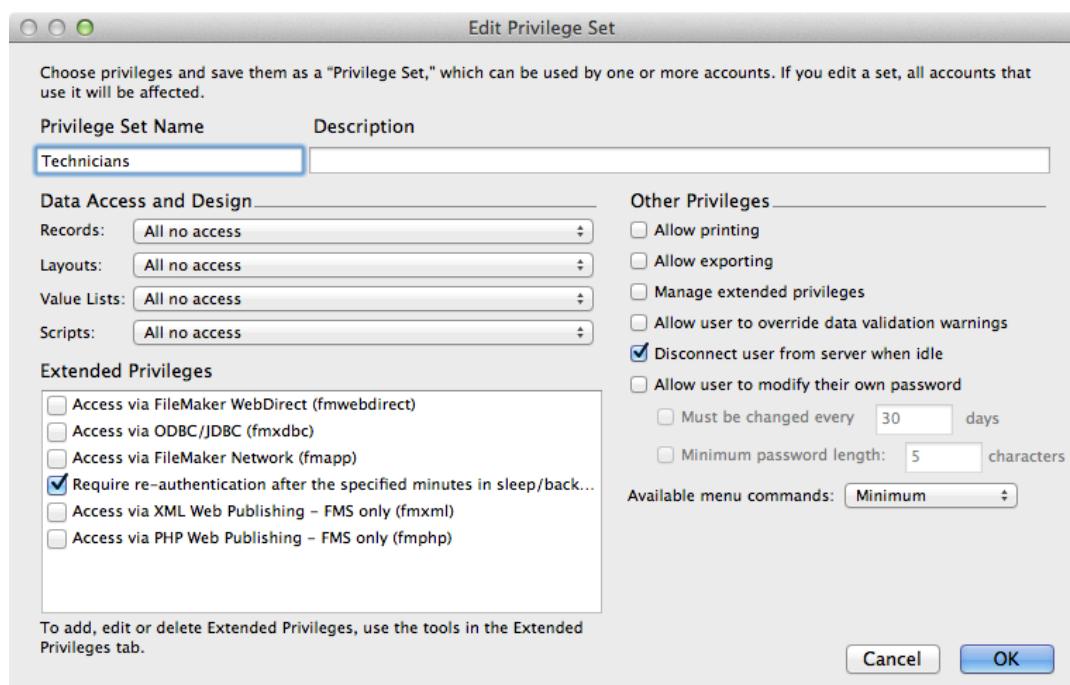


FIGURE 84

4. Choose **Custom Privileges...** in the **Records** drop-down in the Data Access and Design section. This will bring up the **Custom Record Privileges** dialog.
5. Click on the **Assets** table in the list and choose **yes** in both the **View** and **Edit** drop-downs. Choose **no** in both the **Create** and **Delete** drop-downs and choose **all** in the **Field Access** drop-down.
6. Click on the **Customers** table in the list and choose **yes** in the **View** drop-down and choose **no** in the **Edit**, **Create**, and **Delete** drop-downs. Choose **all** in the **Field Access** drop-down. Click **OK**.
7. Specify the following for the remaining **Data Access and Design** options:
  - Layouts: All view only
  - Value Lists: All view only
  - Scripts: All executable only
8. In the **Other Privileges** area, check the boxes for **Allow printing**, **Allow exporting**, and **Allow user to modify their own password**. Choose **All** in the **Available menu commands** drop-down.
9. To turn on access to this file when hosted via peer-to-peer or FileMaker Server, in the **Extended Privileges** section, check the box next to **Access via FileMaker Network (fmapp)**. The Privilege Set should look the same as Figure 85.

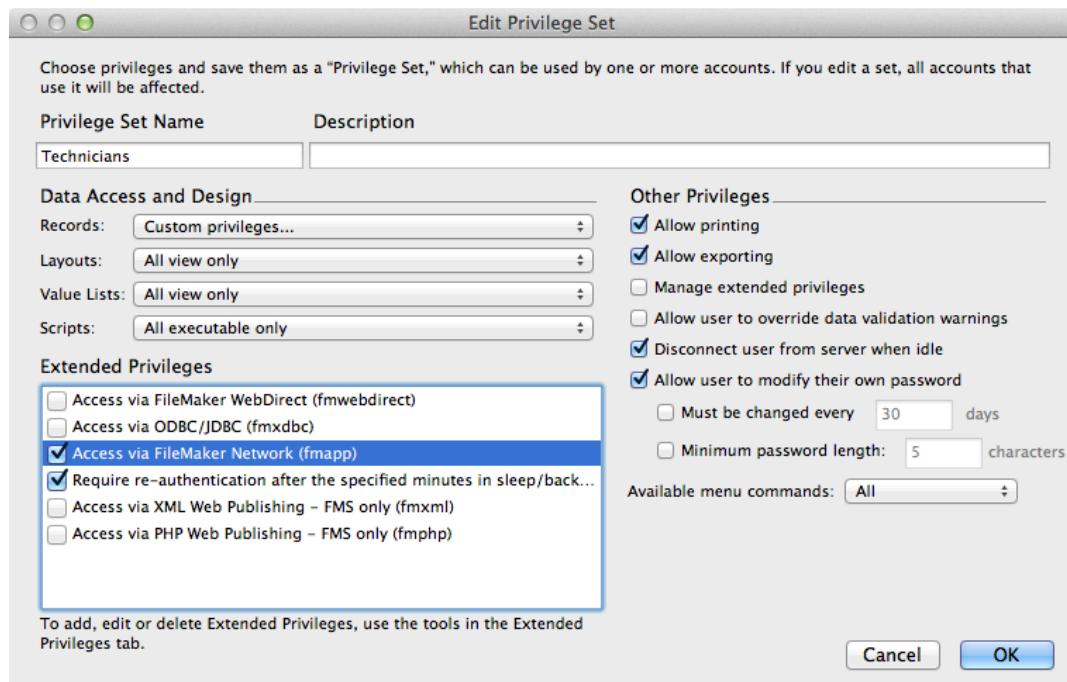


FIGURE 85

10. Click **OK**.
11. Choose the **Accounts** tab and click **New....**
12. For the **Account Name**, type "**Bob**".
13. For the **Password**, type "**12345**" and check the box for **User must change password on next login**.
14. Choose **Technicians** from the **Privilege Set** drop-down (Figure 86).
15. Click **OK** twice to close the **Edit Account** and the **Manage Security** dialogs.
16. Enter a **Full Access** account name and password to save the changes.

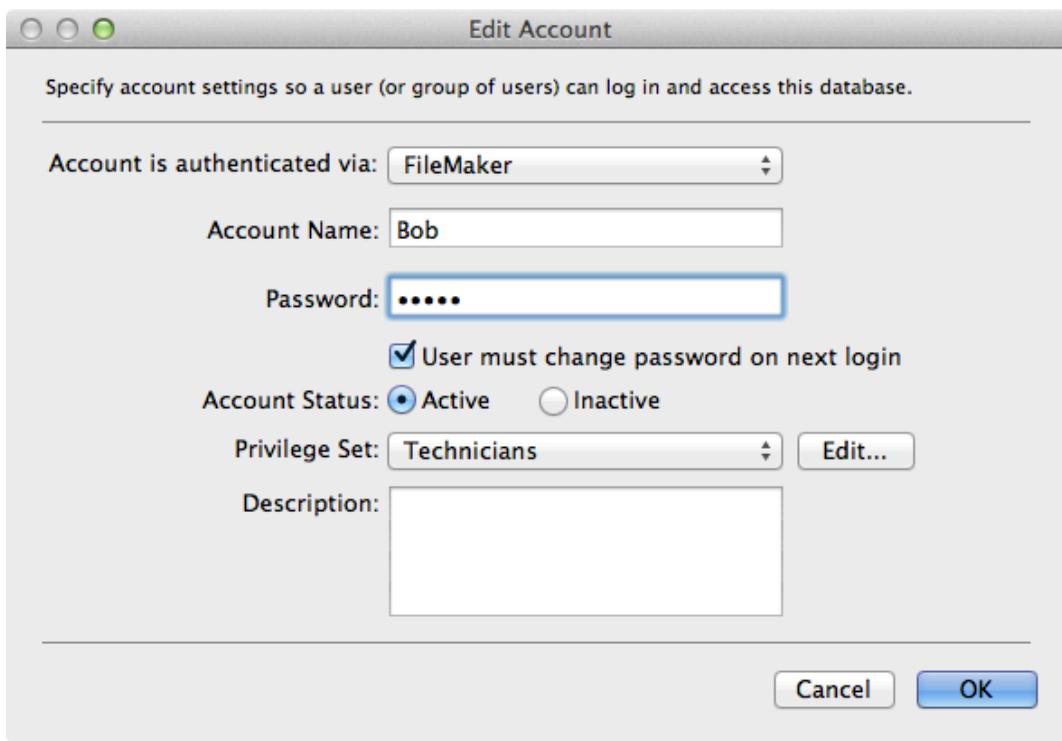


FIGURE 86

To test the newly created **Technicians** privilege set, close the Equipment Rentals file, reopen the file, and login with the account **Bob**. You will be prompted to change the password on the account. Change the password to anything you would like. Once logged in as **Bob**, verify that you cannot create or delete records and that you cannot modify layouts or scripts. Also verify that you cannot edit Customer records but can edit Asset records.

Note: To allow you to open the file, the completed final file does not have a password for the Admin account.

By implementing accounts and privileges in your FileMaker solutions, you are securing your data. For Equipment Providers, Inc., the solution will limit access properly for Technicians. Other privilege sets could be added to provide other, tailored security measures. While security is not a requirement, it is highly recommended in all solutions. Now that your FileMaker solution fulfills the needs of Equipment Providers, Inc., the next lesson will focus on deploying your solution.

## Review Questions

1. What is the difference between an account and a privilege set, and how are they related to one another?
2. If you open a file using FileMaker Go and are not prompted for a username and password, what can you conclude?
3. With how many privilege sets may an account be associated?

# Answers

1. The difference between an account and a privilege set is an account controls your ability to open a file, whereas a privilege set governs what you can see and do in the file.
2. If you are not prompted for a password, you can conclude that there is a default login enabled.
3. Every account, whether authenticated internally or externally, must be associated with one and only one privilege set.

## Lesson 19

# Deployment

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**Time:** This lesson takes approximately 20 minutes to complete.

**Files:** Equipment Rentals.fmp12



# Objectives

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**After this lesson, you will be able to:**

- **Describe the differences between peer-to-peer and FileMaker Server hosting**
- **Open files on FileMaker Pro and FileMaker Go**
- **Transfer local files to FileMaker Go**

The term *deployment* refers to the various means by which FileMaker developers make solutions available for use by clients. The term also encompasses the standard practices and procedures by which a FileMaker database system is maintained and kept running.

From FileMaker Server, to peer-to-peer sharing and local access, there are many ways to deploy a solution to multiple users. This lesson reviews the deployment options available for FileMaker solutions, discussing the specific advantages of each method and when it might be best to use that method.

FileMaker solutions can be shared in 3 different ways:

- Solution can be opened on your device as a standalone file. The file will normally be saved locally on the device accessing the file.
- Solution can be hosted for groups of 5 or less by FileMaker Pro for access by FileMaker Pro and FileMaker Go users.
- Solution can be hosted by FileMaker Server for larger groups for access by FileMaker Pro, FileMaker Go and web browser users. In this case, concurrent connections are needed to allow access by FileMaker Go and web browser users.

In this lesson, you will learn about these methods of deployment.

# Network Sharing

While a FileMaker solution can be used by a single user who opens it locally on their computer or iOS device, one of the FileMaker platform's most prized features is its ability to allow multiple users to access a solution simultaneously. There are two ways that a FileMaker solution can be shared by multiple users.

## Using FileMaker Pro

FileMaker Pro (or Pro Advanced) can host a solution for as many as five users running either FileMaker Pro or FileMaker Go. Peer-to-peer sharing is appropriate when a small group of users needs occasional access to files.

There are two steps required to set up peer-to-peer file sharing. First, open the file to be shared in FileMaker Pro and enable network file sharing. Then, add the network access extended privilege to one or more privilege sets. You can use the **FileMaker Network Settings** dialog shown in Figure 87 to complete both steps. To access it, choose **File > Sharing > Share with FileMaker Clients....**

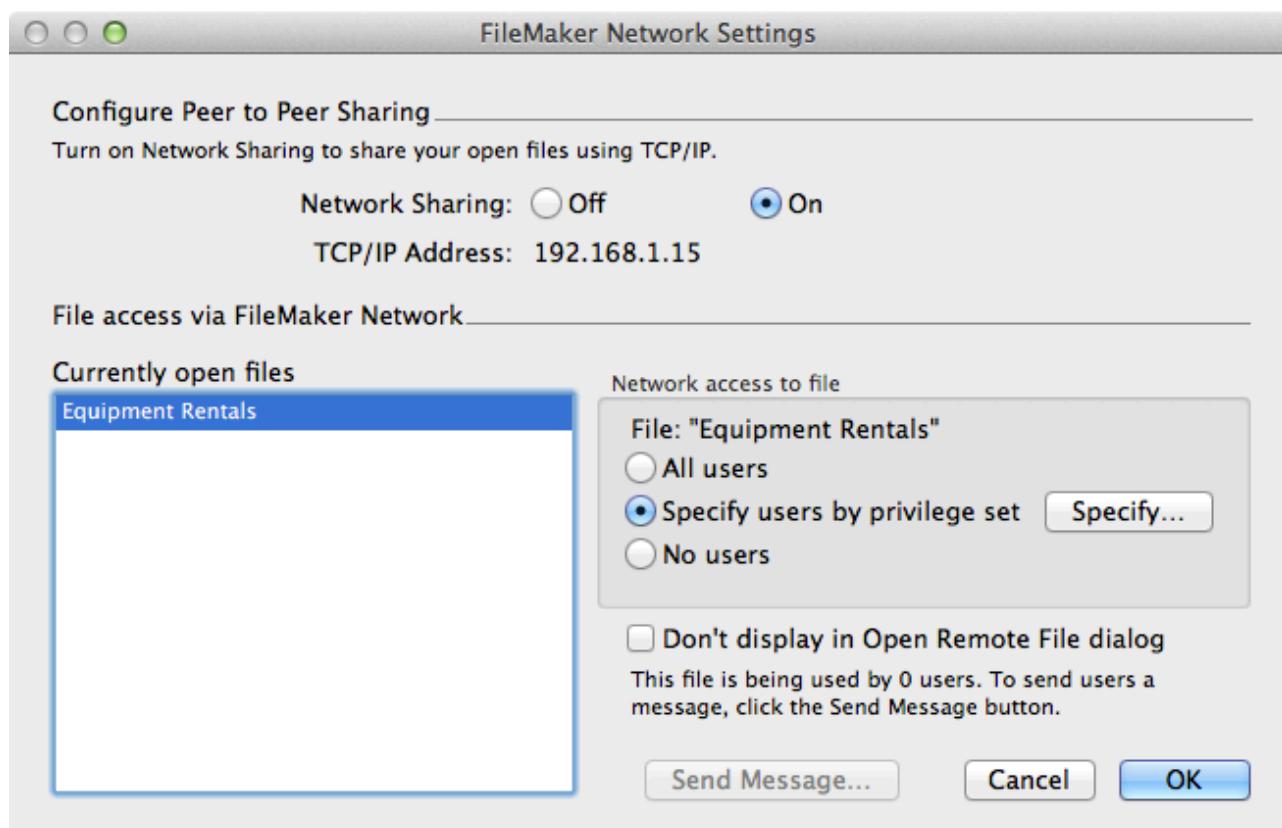


FIGURE 87

After enabling Network Sharing, the IP address will appear that users or "guests" can use to connect to the hosted file. Select the files you want to share from the **Currently open files** list, and then specify which groups should have network access to the file. The file must remain open on the host for a guest to access it.

Once this has been done, a user will be able to make a remote connection to the locally hosted file. Details on connecting to a hosted file can be found in the next section.

## Using FileMaker Server

FileMaker Server is a dedicated product for sharing and maintaining hosted database files. FileMaker Server provides many benefits over peer to peer sharing, including backup and script schedules, SSL encryption, and better shared performance. You use the **FileMaker Server Admin Console** shown in Figure 88 to configure and manage FileMaker Server. You can use the **Admin Console** to manage server settings, backup and script schedules, monitor server usage, and download database files from a remote connection.

The screenshot shows the 'Activity' tab in the FileMaker Server 13 Admin Console. The left sidebar contains links for Status, Activity, Schedules, Statistics, Log Viewer, General Settings, Database Server, and Web Publishing. The main area is titled 'Activity' with a 'Databases' tab selected. It displays a table with columns: NAME, CLIENTS, STATUS, GO/PRO, FMWEBDIRECT, XML, PHP, and ODBC/JDBC. One row is visible for 'FMServer\_Sample.fmp12' with 0 clients, Normal status, and all other fields marked with a dot. Below this is a smaller table for Clients with columns: COMPUTER NAME, ACCOUNT NAME, TYPE, and IP ADDRESS, which is currently empty.

FIGURE 88

The latest hardware requirements for FileMaker Server can be found at the FileMaker Server Technical Specifications page:

<http://www.filemaker.com/products/filemaker-server/server-13-specifications.html>

# Opening FileMaker Files

## Opening Local Files

Databases that are stored locally on your computer or iOS device can be opened directly using FileMaker Pro or FileMaker Go.

In FileMaker Pro, choose **File** menu > **Open** or press **Command-O** (OS X) or **Ctrl-O** (Windows). You will then be prompted to locate the file you wish to open.

In FileMaker Go, after opening the app, the home screen appears. The Home screen provides access to recently used files, files on your device, remote hosts, and FileMaker Go application settings.

To open a local file, tap the filename in the list of files on the **Device** panel.

## Transferring Files to an iOS Device

There are four methods to transfer files to FileMaker Go so that you can use the files locally on your device:

- Connect your device to iTunes through your computer with a USB cable
- Send a FileMaker file to your device through email
- Access a file from a website
- Access a file from another application, such as Dropbox or Box.com

If a file is transferred using any of these methods, the file is copied to the device and will be accessible from the **Files on Device** list within FileMaker Go.

## Activity 19.1: Opening a local FileMaker file with FileMaker Go

You will transfer the Equipment Rentals file to an iOS device and test the functionality in FileMaker Go.

1. Connect your iOS device to your computer via USB and open iTunes.
2. In iTunes, select your iOS device and click the **Apps** tab.
3. Below **File Sharing**, choose FileMaker Go from the **Apps** list, then click **Add**.
4. Choose the files to transfer, then click **Open**.

5. Open **FileMaker Go** on your iOS device. Similar to Figure 89, **Equipment Rentals** will appear as a local file. Tap on the file to open it.

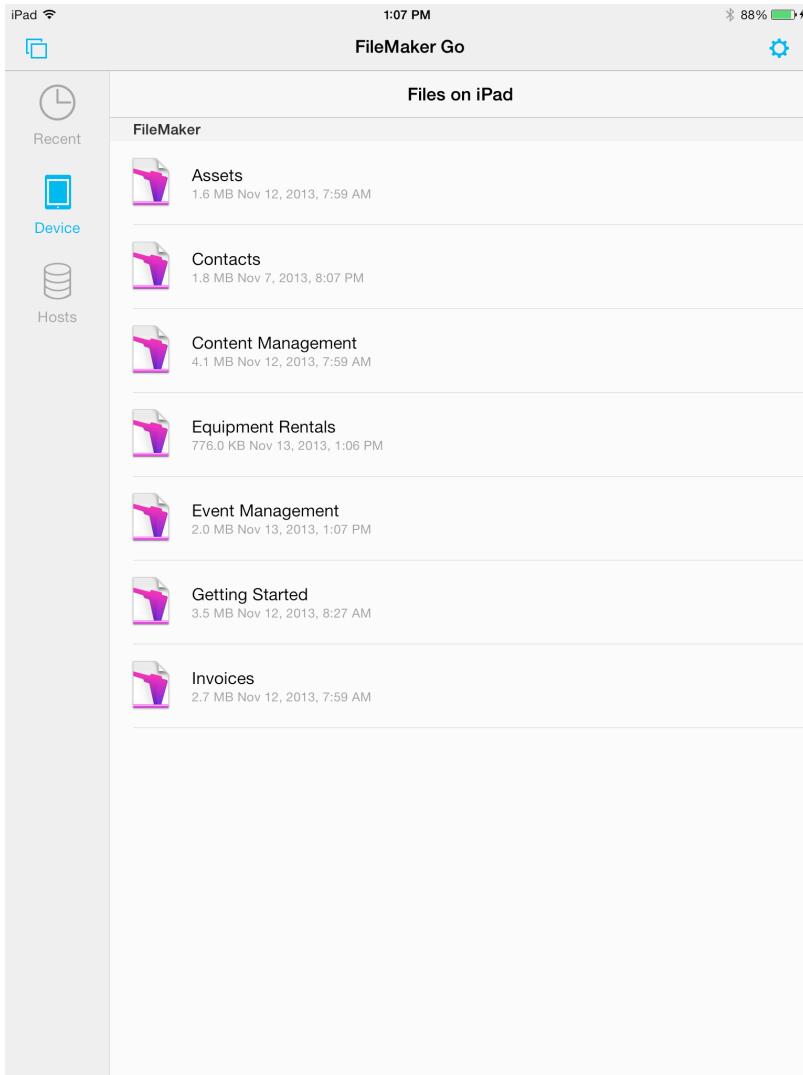


FIGURE 89

Based on the opening script, you will be taken to either the **Asset Details - iPhone** or **Asset Details - iPad** layout, depending on your device.

Note: You can also use one of the other file transfer methods mentioned above.

If a file with the same name already exists, the existing file will not be overwritten. Instead a serial number is added to the file name. For example, if the file **SomeDatabase.fmp12** already exists on your device and then you receive that file again in an email, the emailed copy of the file is renamed **SomeDatabase 1.fmp12**. The next integer is used for each additional copy of the same file.

FileMaker files copied to an iOS device are accessible by a single-user only. This means that data entered in a local database will only reside on that device. With additional development, it is possible for a local file to interact with a hosted file and synchronize data between the two. If your data must be synchronized with other FileMaker files, you will need to create a data sync process by using scripting or a commercial syncing solution.

## Opening Hosted Files

Accessing hosted files in FileMaker Go is similar to the way hosted files are opened in FileMaker Pro, including any hosts found on the local network and any hosts saved by manually entering their address. Figures 90 and 91 show the FileMaker Go home screen with the **Hosts** panel selected on the iPad and iPhone respectively.

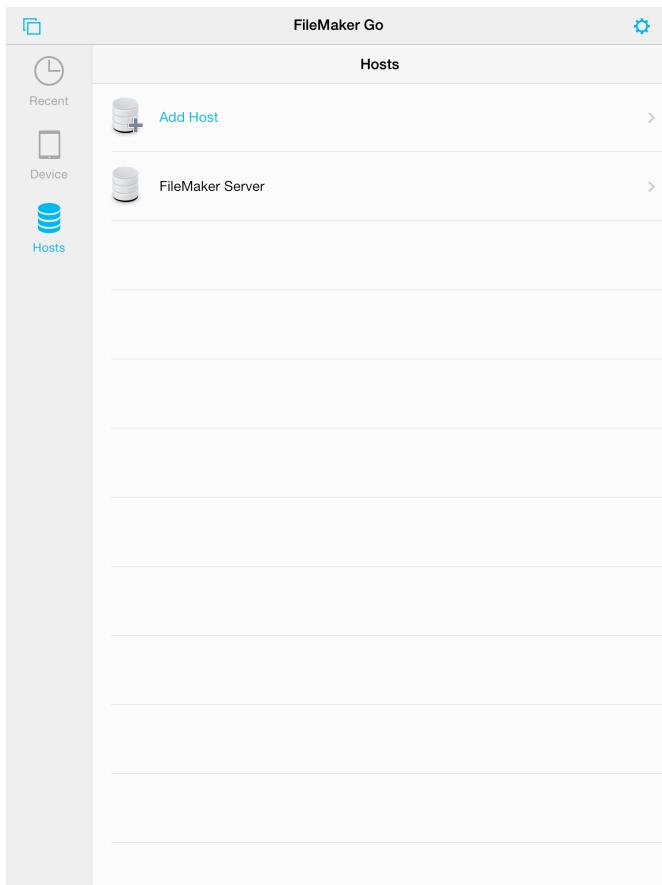


FIGURE 90

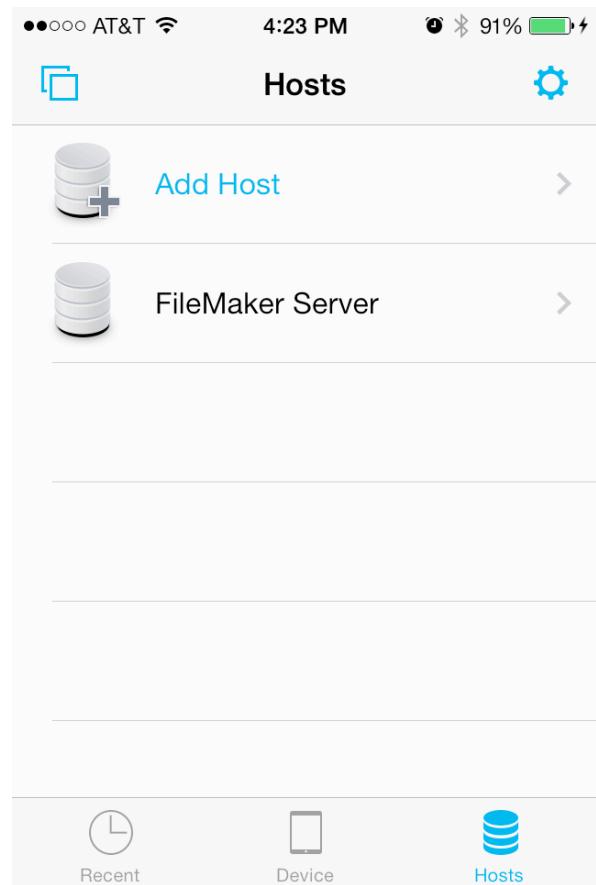


FIGURE 91

To open a file on one of the hosts tap on a host to view a list of the files available on that host, then tap on a file name to open the file.

## Review Questions

1. What are some benefits to FileMaker Server hosting over peer-to-peer sharing?
2. What are four methods for copying a local file to FileMaker Go?
3. Can a local file interact with a hosted file?

# Answers

1. FileMaker Server can share to more users. It also can protect your data with backups and SSL encryption over the network. Using FileMaker Server also allows for better performance than peer-to-peer sharing.
2. The four methods for copying a local file to FileMaker Go, are: 1) file can be copied to the device by using iTunes, 2) sending the file using email, 3) downloading the file from a website, and/or 4) opening the file in a file sharing app like Dropbox or Box.com.
3. Yes, local files can interact with hosted files with a combination of file references and scripting.

# Conclusion

Congratulations! You have successfully built a FileMaker solution that incorporates relationships, layouts, calculations, navigation scripts, reports, and security. More importantly, you have built a solution that solves the needs of a business.

While the Equipment Rentals solution you just created contains many features, this only scratches the surface of FileMaker Pro's capabilities. To learn more about all of these features please proceed to **FileMaker Training Series: Advanced**.

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