Access 2013 Absolute Beginner’s Guide
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About the Author

Alison Balter is the president of InfoTech Services Group, Inc., a computer consulting firm based in Newbury Park, California. Alison is a highly experienced independent trainer and consultant specializing in Windows applications training and development. During her 28 years in the computer industry, she has trained and consulted with many corporations and government agencies. Since Alison founded InfoTech Services Group, Inc. (formerly Marina Consulting Group) in 1990, its client base has expanded to include major corporations and government agencies such as Cisco, Shell Oil, Accenture, Northrop, the U.S. Drug Enforcement Administration, Prudential Insurance, Transamerica Insurance, Fox Broadcasting, the U.S. Navy, the University of Southern California, Massachusetts Institute of Technology, and others.


An active participant in many user groups and other organizations, Alison is a past president of the Independent Computer Consultants Association of Los Angeles and of the Los Angeles Clipper Users’ Group. She served as president of the Ventura County Professional Women’s Network for 2 years.

Dedication

Many people are important in my life, but there is no one as special as my husband Dan. I dedicate this book to Dan. Thank you for your ongoing support, for your dedication to me, for your unconditional love, and for your patience. Without you, I’m not sure how I would make it through life. Thank you for sticking with me through the good times and the bad! There’s nobody I’d rather spend forever with than you.

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We Want to Hear from You!

As the reader of this book, you are our most important critic and commentator. We value your opinion and want to know what we’re doing right, what we could do better, what areas you’d like to see us publish in, and any other words of wisdom you’re willing to pass our way.

We welcome your comments. You can email or write to let us know what you did or didn’t like about this book—as well as what we can do to make our books better.

*Please note that we cannot help you with technical problems related to the topic of this book.*

When you write, please be sure to include this book’s title and author as well as your name, email address, and phone number. We will carefully review your comments and share them with the author and editors who worked on the book.

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Visit our website and register this book at quepublishing.com/register for convenient access to any updates, downloads, or errata that might be available for this book.
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Who Should Read This Book

This book is for anyone comfortable using a personal computer who needs to collect and manipulate information. Experience with Microsoft Access 2013 or an earlier version of Access is helpful, but not necessary. This book takes you from the basic techniques on how to use Microsoft Access 2013 to a strong intermediate level. After reading this book, you should be comfortable creating and working with databases and the objects that they contain.

How This Book Is Organized

This book starts by covering the basics of working with Microsoft Access. You learn the basics of working with databases, tables, queries, forms, and reports. After learning the basics, you are ready to move to more advanced features, where you learn how to build your own databases and tables and how to relate the tables within your database. You are then ready to embark on a journey through power query, form, and report techniques. During the home stretch, you learn about three exciting aspects
of Access 2013. You learn how to create macros, how to share data with other applications, and how to build a database that runs in a browser. Finally, you see how to put everything that you learned together and build a complete application.

Requirements, Editions, and Features

Microsoft hasn’t dramatically increased the hardware requirements for Access 2013 compared to those for earlier versions of Access. Access 2013 runs on existing hardware as well as or even better than earlier versions of Access.

To be sure you can run Access 2013, here’s a look at the basic hardware and operating system requirements:

- 1GHz or faster x86 or x64-bit processor
- 1GB of RAM (32 bit); 2GB of RAM (64 bit)
- 3GB available hard disk space
- 1024 × 576 resolution monitor
- Windows Server 2008 R2 (32 bit or 64 bit), Windows Server 2012, Windows 7, Windows 8, or later operating systems

Now take a peek at some of the techniques for using Access 2013 that you’ll learn about:

- **Overview**—Chapter 1, “Why Use Microsoft Access,” begins by teaching you about relational databases and what Microsoft Access 2013 offers. You preview the database components and see the types of things you can do with Microsoft Access.

- **Getting started**—Chapter 2, “Getting Started with Microsoft Access,” covers the process of creating your own database, both with and without a template. You learn how to view database objects, and how to perform important tasks such as how to open and close databases.

- **Table basics**—Chapter 3, “Tables: The Repository for Your Data,” shows you how easy it is to work with data in Access. You learn how to add, edit, and delete table data. You also learn how to search for and filter data.

- **Retrieving the data you need**—Chapter 4, “Using Queries to Retrieve the Data You Need,” shows you all the basics of working with queries. You learn techniques such as how to select fields, apply criteria, and order the query result.

- **Displaying data with forms**—Chapter 5, “Using Forms to Display and Modify Information,” shows you how to manipulate table data from within a form.
You learn how to add, edit, and delete data and how to search and filter form data.

- **Creating forms**—Chapter 6, “Creating Your Own Forms,” shows you how to build forms using the AutoForm feature and the wizards. You learn about three important types of forms: Navigation, Split, and Multiple Item.

- **Printing data with reports**—Chapter 7, “Using Reports to Print Information,” first shows you how to open, view, and print an existing report. You learn important techniques such as how to zoom, move from page to page, and view multiple pages.

- **Creating Reports**—Chapter 8, “Building Your Own Reports,” shows you how to use the AutoReport feature and the wizards to build your own reports. You even learn how to design mailing labels!

- **Building tables**—Chapter 9, “Creating Your Own Tables,” covers the process of creating new tables. In this chapter, you learn important techniques such as how to select the best field type and how to work with field properties.

- **Relating the data in your database**—Chapter 10, “Relating the Information in Your Database,” shows you how to relate the tables that you build. After this chapter provides you with a crash course on database design, you learn how to establish relationships and how to enforce referential integrity.

- **More about queries**—Chapter 11, “Enhancing the Queries That You Build,” enhances what you learned about queries in Chapter 4. In this chapter, you learn how to build queries based on multiple tables. You also learn how to modify the datasheet view of a query and how to work with criteria in text, number, and date fields.

- **Advanced query techniques**—Chapter 12, “Advanced Query Techniques,” shows you how to add calculations to the queries that you build, how to run parameter queries when you don’t know the criteria at design time, and how to use action queries to update your table data. You also learn how and why to work with outer joins.

- **Working with forms**—Chapter 13, “Building Powerful Forms,” enhances what you learned about forms in Chapters 5 and 6. In this chapter, you learn how to work with form controls, how to apply conditional formatting, and how to modify form and control properties.

- **Advanced form techniques**—Chapter 14, “Advanced Form Techniques,” shows you how to work with combo boxes and the Command Button Wizard and how to build forms based on more than one table. You also learn how to work with subforms.
• **Working with reports**—Chapter 15, “Building Powerful Reports,” enhances what you learned about reports in Chapters 7 and 8. In this chapter you learn how to work with report bands, work with controls, build multitable reports, and work with subreports.

• **Advanced report techniques**—Chapter 16, “Advanced Report Techniques,” shows you how to add sorting and groupings to the reports that you build. You learn how to work with group header and footer properties and how to take advantage of report properties.

• **Using macros to automate your database**—Chapter 17, “Automating Your Database with Macros,” shows you how to automate the databases that you build. In this chapter, you learn important techniques such as how to create and run macros, how to control the flow of the macros that you build, and how to create submacros. You also learn how to take advantage of embedded macros.

• **Advanced macro concepts**—Chapter 18, “Advanced Macro Techniques,” shows you how to use data macros and drill through macros. You learn how to work with variables and error handling, and finally, you learn how to take advantage of a special macro: AutoExec.

• **Sharing data with other applications**—One of Access’s greatest strengths is its capability to share data with other applications. In Chapter 19, “Sharing Data with Other Applications,” you learn how to export data to and import data from Excel, text files, and other Access databases. You learn how to link to data in other databases, and how to use a powerful tool called the Linked Table Manager to manage the links that you create. As a special bonus, you learn how to link to data in a SQL Server database so that you can take advantage of Access’s strong capability to participate in a client/server environment.

• **Running your application in a web browser**—Chapter 20, “Working with Web Databases,” shows you how to take your database to the web. In this chapter, you learn about web databases and what they are. You learn how to build and modify web forms. Finally, you witness your completed application running in a web browser.

• **A complete application**—Chapter 21, “Putting it All Together,” shows you how to build a database, complete with all the necessary elements. You learn how to design the tables, queries, forms, reports, and macros that compose your completed database.

Whether it’s the new and exciting macro environment, or the ability to easily take Access data to the web, it won’t take long for you to get to know this new and
exciting version of Microsoft Access. Access 2013 is fast, stable, and extremely packed with new and thrilling features. The Absolute Beginners Guild to Access 2013 is your personal guide to learning how to use Access 2013 and how to get the most out of what it has to offer.

Using This Book


Here’s a quick look at a few structural features designed to help you get the most out of this book.

- **Chapter objectives**—At the beginning of each chapter is a brief summary of topics addressed in that chapter. The objectives enable you to quickly see what is covered in the chapter.

- **The Absolute Minimum**—Each chapter ends with a section called “The Absolute Minimum.” Rather than just providing a review of what you just learned, this section consolidates the key points in the chapter and often adds a few ideas not covered in the body of the chapter.
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WHY USE MICROSOFT ACCESS?

In this chapter, you learn what a relational database is. You then explore all the types of objects available in Microsoft Access. You are exposed to tables, relationships, queries, forms, reports, and modules. You then discover some of the exciting things you can do with Access. With that information under your belt, you will be ready to dive into the exciting world of working with Microsoft Access.
What Is a Relational Database?

The term database means different things to different people. For many years, in the world of the older database technologies, database was used to describe a collection of fields and records. Access refers to this type of collection as a table. In Access terms, a database is a collection of all the tables, queries, forms, reports, macros, and modules that compose a complete system. Relational refers to concepts based on set theory. These concepts are covered in Chapter 10, “Relating the Information in Your Database.”

What Types of Things Can I Do with Microsoft Access?

Access offers a variety of features for different database needs. You can use it to develop five general types of applications:

- Personal applications
- Small-business applications
- Departmental applications
- Corporation-wide applications
- Front-end applications for enterprisewide client/server databases
- Web applications
- Access as a development platform for personal applications

At a basic level, you can use Access to develop simple, personal database-management systems. Some people automate everything from their wine collections to their home finances. The one thing to be careful of is that Access is deceptively easy to use. Its wonderful built-in wizards make Access look like a product that anyone can use. After answering a series of questions, you have finished application switchboards that enable you to easily navigate around your application, data-entry screens, reports, and the underlying tables that support them. Actually, when Microsoft first released Access, many people asked whether the author was concerned that her business as a computer programmer and trainer would diminish because Access seemed to let absolutely anyone write a database application. Although it’s true that you can produce the simplest of Access applications without any thought for design and without any customization, most applications require at least some design and customization.
If you’re an end user and don’t want to spend too much time learning the intricacies of Access, you’ll be satisfied with Access as long as you’re happy with a wizard-generated personal application. After reading this text, you can make some modifications to what the wizards have generated, and no problems should occur. It’s when you want to substantially customize a personal application without the proper knowledge base that problems can happen.

Access as a Development Platform for Small-Business Applications

Access is an excellent platform for developing an application that can run a small business. Its wizards let you quickly and easily build the application’s foundation. The ability to create macros and to build code modules allows power users and developers to create code libraries of reusable functions, and the ability to add code behind forms and reports allows them to create powerful custom forms and reports.

The main limitation of using Access for developing a custom small-business application is the time and money involved in the development process. Many people use Access wizards to begin the development process but find they need to customize their applications in ways they can’t accomplish on their own. Small-business owners often experience this problem on an even greater scale than personal users. The demands of a small-business application are usually much higher than those of a personal application. Many doctors, attorneys, and other professionals have called the author after they reached a dead end in the development process. They’re always dismayed at how much money it will cost to make their application usable. An example is a doctor who built a series of forms and reports to automate her office. All went well until it came time to produce patient billings, enter payments, and produce receivable reports. Although at first glance these processes seem simple, on further examination the doctor realized that the wizard-produced reports and forms did not provide the sophistication necessary for her billing process. Unfortunately, the doctor did not have the time or programming skills to add the necessary features. So, in using Access as a tool to develop small-business applications, you must be realistic about the time and money involved in developing anything but the simplest of applications.

Access as a Development Platform for Departmental Applications

Access is perfect for developing applications for departments in large corporations. Most departments in large corporations have the development budgets to produce well-designed applications.
Fortunately, most departments also usually have a PC guru who is more than happy to help design forms and reports. This gives the department a sense of ownership because it has contributed to the development of its application. If complex form, report design, or coding is necessary, large corporations usually have on-site resources available that can provide the necessary assistance. If the support is not available within the corporation, most corporations are willing to outsource to obtain the necessary expertise.

Access as a Development Platform for Corporation-Wide Applications

Although Access might be best suited for departmental applications, you can also use it to produce applications that you distribute throughout an organization. How successful this endeavor is depends on the corporation. There’s a limit to the number of users who can concurrently share an Access application while maintaining acceptable performance, and there’s also a limit to the number of records that each table can contain without a significant performance drop. These numbers vary depending on factors such as the following:

- How much traffic already exists on the network.
- How much RAM and how many processors the server has.
- How the server is already being used. For example, are applications such as Microsoft Office being loaded from the server or from local workstations?
- What types of tasks the users of the application are performing. For example, are they querying, entering data, running reports, and so on?
- Where Access and Access applications are run from (the server or the workstation).
- What network operating system is in place.

The author’s general rule of thumb for an Access application that’s not client/server-based is that poor performance generally results with more than 10 to 15 concurrent users and more than 100,000 records. Remember that these numbers vary immensely depending on the factors mentioned and on what you and the other users of the application define as acceptable performance. If you go beyond these limits, you should consider using Access as a front end to a client/server database such as Microsoft SQL Server—that is, you can use Access to create forms and reports while storing tables and possibly queries on the database server.
Access as a Front End for Enterprisewide Client/Server Applications

A client/server database, such as Microsoft SQL Server or Oracle, processes queries on the server machine and returns results to the workstation. The server software can’t display data to the user, so this is where Access comes to the rescue. Acting as a front end, Access can display the data retrieved from the database server in reports, datasheets, or forms. If the user updates the data in an Access form, the workstation sends the update to the back-end database. You can accomplish this process either by linking to these external databases so that they appear to both you and the user as Access tables or by using techniques to access client/server data directly.

Access as a Tool to Develop Web Applications

Introduced with Access 2010 was the ability for you to use Access to build web applications, which are applications that can run in a browser. Access’s web capabilities have been greatly enhanced in Access 2013. Chapter 20, “Working with Web Databases,” cover the intricacies of designing and building a web database.

A Preview of the Database Components

As mentioned previously, tables, queries, forms, reports, macros, and modules combine to compose an Access database. Each of these objects has a special function. The following sections take you on a tour of the objects that make up an Access database. The examples use the sample Northwind database to illustrate the use of each object. If you want to follow along, you can create the Northwind database as covered in Chapter 2, “Getting Started with Microsoft Access.” You can log in as any user, which will take you to the Home form. Close the Home form to follow along.

Tables: A Repository for Data

Tables are the starting point for an application. Whether data is stored in an Access database or you reference external data (such as data in an Excel spreadsheet) by using linked tables, all the other objects in a database either directly or indirectly reference tables.

To view all the tables that are contained in an open database, you select Tables from the list of objects available in the database (see Figure 1.1). A list of available tables appears (see Figure 1.2).
FIGURE 1.1
To view the tables in a database, select Tables from the list of available objects.

FIGURE 1.2
You can view the tables contained in a database.
To view the data in a table, double-click the name of the table you want to view. (You can also right-click the table and then select Open.) Access displays the table’s data in a datasheet that includes all the table’s fields and records (see Figure 1.3). You can modify many of the datasheet’s attributes and even search for and filter data from within the datasheet; these techniques are covered later in this chapter.

FIGURE 1.3
A table’s datasheet contains fields and records.

If the table is related to another table (such as the Northwind database’s Customers and Orders tables), you can also expand and collapse the subdatasheet to view data stored in child tables (see Figure 1.4).

FIGURE 1.4
Datasheet view of the Customers table in the Northwind database.
As an Access user, you often want to view the table’s design, which is the blueprint or template for the table. To view a table’s design (see Figure 1.5), right-click the table name in the Navigation Pane, and then select Design View. In Design view, you can view or modify all the field names, data types, and field and table properties. Access gives you the power and flexibility you need to customize the design of tables. Chapter 3, “Tables: The Repository for Your Data,” and Chapter 9, “Creating Your Own Tables,” cover these topics.

**FIGURE 1.5**
The design of the Customers table.

### Relationships: Tying the Tables Together

To properly maintain data’s integrity and ease the process to work with other objects in a database, you must define relationships among the tables in a database. You accomplish this by using the Relationships window. To view the Relationships window, select Relationships from the Database Tools tab of the Ribbon. The Relationships window appears. In this window, you can view and maintain the relationships in the database (see Figure 1.6). If you or a fellow user or developer have set up some relationships, but you don’t see any in the Relationships window, you can select All Relationships in the Relationships group on the Design tab of the Ribbon to unhide any hidden tables and relationships.

Many of the relationships in Figure 1.6 have join lines between tables and show a number 1 on one side of the join and an infinity symbol on the other. This indicates a one-to-many relationship between the tables. If you double-click a join line, the Edit Relationships dialog box opens (see Figure 1.7). In this dialog box,
you can specify the exact nature of the relationship between tables. The relationship between the Customers and Orders tables in Figure 1.7, for example, is a one-to-many relationship with referential integrity enforced. This means that the user cannot add orders for customers who don’t exist. Notice in Figure 1.7 that the Cascade Update Related Fields check box is not selected. This means that if the user cannot update the CustomerID field. Because Cascade Delete Related Records is not checked in Figure 1.7, the user cannot delete from the Customers table customers who have corresponding orders in the Orders table.
Chapter 10 extensively covers the process to define and maintain relationships. For now, you should establish relationships both conceptually and literally as early in the design process as possible. Relationships are integral to successfully design and implement your application.

Queries: Stored Questions or Actions You Apply to Data

Queries in Access are powerful and multifaceted. A query retrieves data from your database based on criteria you specify. An example is a query that retrieves all employees who live in Florida. Select queries enable you to view, summarize, and perform calculations on the data in tables. Action queries enable you to add to, update, and delete table data. To run a query, first close the Relationship window if you still have it open. Next select Queries from the Objects list and then double-click the query you want to run. Or you can click in the list of queries to select the query you want to run and then right-click and select Open. When you run a Select query, a datasheet appears, containing all the fields specified in the query and all the records meeting the query’s criteria (see Figure 1.8). When you run an Action (Append, Update, Delete, or Make Table) query, Access runs the specified action, such as making a new table or appending data to an existing table. In general, you can update the data in a query result because the result of a query is actually a dynamic set of records, called a dynaset, based on the tables’ data. A dynaset is a subset of data on which you can base a form or report.

FIGURE 1.8
The result of running the Product Orders query.

When you store a query, Access stores only the query’s definition, layout, or formatting properties in the database. Access offers an intuitive, user-friendly tool that helps you design queries: the Query Design window (see Figure 1.9). To open this window, select Queries from the Objects list in the Navigation Pane, choose the query you want to modify, right-click, and select Design View.
The query pictured in Figure 1.9 selects data from the Customers table. It displays the Company, Job Title, Work Phone, Home Phone, and Mobile Phone from the Customers table. Chapter 4, “Using Queries to Retrieve the Data You Need,” Chapter 11, “Enhancing the Queries That You Build,” and Chapter 12, “Advanced Query Techniques,” cover the process of designing queries. Because queries are the foundation for most forms and reports, they are covered throughout this book as they apply to other objects in the database.

FIGURE 1.9
The design of a query that selects data from the Customers table.

Forms: A Means to Display, Modify, and Add Data

Although you can enter and modify data in a table’s Datasheet view, you can’t control the user’s actions very well, nor can you do much to facilitate the data-entry process. This is where forms come in. Access forms can have many traits, and they’re flexible and powerful.

To view a form, you select Forms from the Objects list. Then you double-click the form you want to view or right-click in the list of forms to select the form you want to view and then click Open. Figure 1.10 illustrates a form in Form view. This Customer Details form is actually two forms in one: one main form and one subform. The main form displays information from the Customers table, and the subform displays information from the Orders table (a table related to the Customers table). As the user moves from customer to customer, the form displays the orders associated with that customer. When the user clicks to select an order, the form displays the entire order.
Like tables and queries, you can also view forms in Design view. The Design view provides tools you may use to edit the layout of your form. To view the design of a form, you select Forms from the Objects list, choose the form whose design you want to modify, and then right-click and select Design View. Figure 1.11 shows the Customer Details form in Design view. Chapter 5, “Using Forms to Display and Modify Information,” Chapter 13, “Building Powerful Forms,” and Chapter 14, “Advanced Form Techniques,” cover forms in more detail.

Reports: Turning Data into Information

Forms enable you to enter and edit information, but with reports, you can display information, usually to a printer. Figure 1.12 shows a report in Preview mode. To preview any report, select Reports from the Objects list. Double-click the report you want to preview or right-click the report want to preview from the list of reports in the Navigation Pane, and then click Open. Notice the report in Figure 1.12. It shows the Monthly Sales Report which outputs the sales by product for a month. If you attempt to run this report, Access loads the Sales Reports Dialog form. Here you select how you want to view the sales, the sales period, and the year, quarter, or month as appropriate. For the example, I selected Sales by Product, Monthly Sales, 2006 for the year, and June for the month. Like forms, reports can be elaborate and exciting, and they can contain valuable information.
As you may have guessed, you can view reports in Design view, as shown in Figure 1.13. To view the design of a report, select Reports from the Objects list, select the report you want to view, and then right-click and select Design View. Figure 1.13 illustrates a report with many sections; in the figure, which shows the Design view of the Invoice report, you can see the Page Header, Order ID Header,

Macros: A Means of Automating a System

Macros in Access aren’t like the macros in other Office products. You can’t record them, as you can in Microsoft Word or Excel, and Access does not save them as Visual Basic for Applications (VBA) code. With Access macros, you can perform most of the tasks that you can manually perform from the keyboard, Ribbon, and QuickAccess toolbar. Macros enable you to build logic in to your application flow.

To run a macro, select Macros from the Objects list, and then double-click the macro you want to run. Or you can right-click the macro and click Run. Access then executes the actions in the macro. To view a macro’s design, you select Macros from the Objects list, select the macro you want to modify, right-click, and select Design View to open the Macro Design window (see Figure 1.14). The macro pictured in Figure 1.14 opens the form called Startup Screen, and then opens the form called Login Dialog. Chapter 17, “Automating Your Database with
Macros,” and Chapter 18, “Advanced Macro Techniques,” cover the process of building and working with macros.

**FIGURE 1.14**
The design of a macro that opens two forms.

### Modules: The Foundation of the Application Development Process

*Modules*, the foundation of any complex Access application, enable you to create libraries of functions that you can use throughout an application. You usually include subroutines and functions in the modules that you build. A function always returns a value; a subroutine does not. By using code modules, you can do just about anything with an Access application. Figure 1.15 shows an example of a module called PurchaseOrders. You can double-click the module in the Navigation Pane to access the module code. This will take you to the Visual Basic Editor (VBE) where you can view and modify the programming code. To return to the Access environment, click the View Microsoft Access toolbar button, or use the Alt-F11 keystroke combination.
FIGURE 1.15
The PurchaseOrders module in Design view, showing the General Declarations section and the Generate and Create functions.
THE ABSOLUTE MINIMUM

With this chapter under your belt, you should now have a clear understanding of what a database is and how you can benefit from using Microsoft Access. Access is a wonderful tool to manage any type of data. As you learned in the chapter, you can use it for anything from managing your exercise history to gathering data over the Internet.

Access databases are composed of tables and other objects. The tables contain columns and rows. The columns are called **fields**, and the rows are called **records**. Each field contains specific information about a **record**. For example, the City field contains the city associated with a customer.

As you saw, Access is a relational database. Quite simply stated, this means that the tables in an Access database usually relate to one another. For example, the Customers table relates to the Orders table in that each order is associated with an existing customer. If you take advantage of referential integrity between tables, you cannot add an order unless it is associated with an existing customer.

After you create tables and relate them, you need to insert, edit, and delete table data. You can accomplish this using Access forms, which can be rich in design and features.

Whereas you modify table data using forms, you view table data using reports. Reports are designed to be viewed on the screen or sent to a printer.

Forms and reports are often based on queries. Select queries return specific rows and columns of data. You can designate criteria so that you get just the data that you need. Whereas select queries return data, action queries modify data. Action queries include insert, update, delete, and make table queries.

Finally, macros and modules enable you to automate the applications that you build. Using macros and modules you can automate tasks that you would usually perform on the keyboard. You can also use macros and modules to validate data. For example, you can use a macro, or programming code, to ensure that if a credit card is selected as the type of payment, that the user enters a credit card number.

All the concepts in this chapter are developed throughout the book. Now that you have an idea what Access is all about, you can jump in and start using it.
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