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Beginning Microsoft® Visual Basic® 2010

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BEGINNING

Microsoft® Visual Basic 2010

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WILEY
Wiley Publishing, Inc.

Beginning Microsoft® Visual Basic 2010

Published by

Wiley Publishing, Inc.

10475 Crosspoint Boulevard

Indianapolis, IN 46256

www.wiley.com

Published simultaneously in Canada

ISBN: 978-0-470-50222-8

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Library of Congress Control Number: 2009943647

For my daughter, Stephanie, my most precious gift from God.

For Wendy, my wife and friend in Christ

—Thearon

For my wife Jennifer and daughter Katelyn.

—Bryan

About the Authors

THEARON WILLIS currently works as a senior developer and develops Windows applications and add-ins for Microsoft Office products using Microsoft Visual Basic .NET. Over the years, Thearon has worked on a variety of systems from mainframe to client-server development.

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Acknowledgments

First and Foremost I Want to thank God for giving me the wisdom and knowledge to share with others and for the many talents that he has blessed me with. I would also like to thank all the people at Wiley who work so hard to bring this book to market. I'd be remiss if I didn't thank my good friend and co-author Bryan Newsome; thanks for your hard work and dedication.

—Thearon

Thanks to Everyone at Wiley who worked so hard to get this book on the shelves. Special thanks to Maureen Spears who went above and beyond to help me finish my review on schedule. Of course, thanks goes out to Thearon Willis for completing one more edition.

—Bryan

Introduction

Visual Basic 2010 is Microsoft's latest version of the highly popular Visual Basic .NET programming language, one of the many languages supported in Visual Studio 2010. Visual Basic 2010's strength lies in its ease of use and the speed at which you can create Windows Forms applications, WPF Windows applications, Web applications, WPF Browser applications, mobile device applications, and Web Services.

In this book, we introduce you to programming with Visual Basic 2010 and show you how to create these types of applications and services. Along the way you'll also learn about object-oriented techniques and learn how to create your own business objects and Windows controls.

Microsoft's .NET Framework provides Visual Basic 2010 programmers with the capability to create full object-oriented programs, just like the ones created using C# or C++. The .NET Framework provides a set of base classes that are common to all programming languages in Visual Studio 2010, which provides you with the same capability to create object-oriented programs as a programmer using C# or C++.

This book will give you a thorough grounding in the basics of programming using Visual Basic 2010; from there the world is your oyster.

Whom This Book Is For

This book is designed to teach you how to write useful programs in Visual Basic 2010 as quickly and easily as possible.

There are two kinds of beginners for whom this book is ideal:

- You're a beginner to programming and you've chosen Visual Basic 2010 as the place to start. That's a great choice! Visual Basic 2010 is not only easy to learn, it's also fun to use and very powerful.
- You can program in another language but you're a beginner to .NET programming. Again, you've made a great choice! Whether you've come from Fortran or Visual Basic 6, you'll find that this book quickly gets you up to speed on what you need to know to get the most from Visual Basic 2010.

What This Book Covers

Visual Basic 2010 offers a great deal of functionality in both tools and language. No one book could ever cover Visual Basic 2010 in its entirety—you would need a library of books. What this book aims to do is to get you started as quickly and easily as possible. It shows you the roadmap, so to speak, of what there is and where to go. Once we've taught you the basics of creating working applications (creating the windows and controls, how your code should handle unexpected events, what object-oriented programming is, how to use it in your applications, and so on) we'll show you some of the areas you might want to try your hand at next:

- Chapters 1 through 9 provide an introduction to Visual Studio 2010 and Windows programming.
- Chapter 6 provides an introduction to XAML and Windows Presentation Foundation (WPF) programming.
- Chapter 10 provides an introduction to application debugging and error handling.
- Chapters 11 through 13 provide an introduction to object-oriented programming and building objects.
- Chapter 14 provides an introduction to creating Windows Forms user controls.
- Chapters 15 and 16 provide an introduction to programming with databases and covers Access, SQL Server, and ADO.NET.
- Chapters 17 and 18 provide an introduction to Dynamic Data Web Sites and ASP.NET and show you how to write applications for the Web.
- Chapter 19 provides a brief introduction to XML, a powerful tool for integrating your applications with others—regardless of the language they were written in.

- Chapter 20 introduces you to deploying applications using ClickOnce technology.

What You Need to Use This Book

Apart from a willingness to learn, all you'll need for the first 15 chapters are a PC running Windows 7 (preferred), or Windows Vista, Windows XP (Home or Professional Edition), Windows Server 2008, Windows Server 2003; Internet Explorer; and of course:

- Microsoft Visual Basic 2010 Professional Edition

  or

- Microsoft Visual Basic 2010 Premium Edition

  or

- Microsoft Visual Basic 2010 Ultimate Edition

  or

- Microsoft Visual Basic 2010 Team Edition

Conventions

To help you get the most from the text and keep track of what's happening, we've used a number of conventions throughout the book.

Try It Out

The *Try It Out* is an exercise you should work through, following the text in the book.

1. They usually consist of a set of steps.
2. Each step has a number.
3. Follow the steps through with your copy of the database.

How It Works

After each *Try It Out*, the code you've typed will be explained in detail.

Boxes like this one hold important, not-to-be forgotten information that is directly relevant to the surrounding text.

Tips, hints, tricks, and asides to the current discussion look like this.

As for other conventions in the text:

- New terms and important words are *highlighted* in italics when first introduced.
- Keyboard combinations are treated like this: Ctrl+R.
- Filenames, URLs, and code within the text are treated like so: `persistence.properties`.

`This book uses monofont type with no highlighting for most code examples.`
`This book uses bolding to emphasize code that is of particular importance in the present context.`

Source Code

As you work through the examples in this book, you may choose either to type in all the code manually or to use the source-code files that accompany the book. All of the source code used in this book is available for download at www.wrox.com. Once at the site, simply locate the book's title (either by using the Search box or by using one of the title lists) and click the Download Code link on the book's detail page to obtain all the source code for the book.

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Errata

We make every effort to ensure that there are no errors in the text or in the code. However, no one is perfect, and mistakes do occur. If you find an error in one of our books, like a spelling mistake or faulty piece of code, we would be very grateful for your feedback. By sending in errata, you may save another reader hours of frustration, and at the same time you will be helping us provide even higher-quality information.

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At http://p2p.wrox.com you will find a number of different forums that will help you not only as you read this book, but also as you develop your own applications. To join the forums, just follow these steps:

1. Go to p2p.wrox.com and click the Register link.
2. Read the terms of use and click Agree.
3. Complete the required information to join as well as any optional information you wish to provide, and click Submit.
4. You will receive an e-mail with information describing how to verify your account and complete the joining process.

> You can read messages in the forums without joining P2P, but in order to post your own messages, you must join.

Once you join, you can post new messages and respond to messages other users post. You can read messages at any time on the Web. If you would like to have new messages from a particular forum e-mailed to you, click the Subscribe to this Forum icon by the forum name in the forum listing.

For more information about how to use the Wrox P2P, be sure to read the P2P FAQs for answers to questions about how the forum software works, as well as many common questions specific to P2P and Wrox books. To read the FAQs, click the FAQ link on any P2P page.

Chapter 1

Welcome to Visual Basic 2010

What You Will Learn in this Chapter

- Using event-driven programming
- Installing Visual Basic 2010
- A tour of the Visual Basic 2010 integrated development environment (IDE)
- Creating a simple Windows program
- Using the integrated Help system

This is an exciting time to enter the world of programming with Visual Basic 2010 and Windows 7. Windows 7 represents the latest Windows operating system from Microsoft and is packed with a lot of new features to make Windows programming fun. Much has changed in the Windows user interface, and Visual Basic 2010 makes it easy to write professional-looking Windows applications as well as web applications and web services. Haven't upgraded to Windows 7 yet? No worries, Visual Basic 2010 also enables you to write professional-looking applications for previous versions of Windows as well.

The goal of this book is to help you use the Visual Basic 2010 programming language, even if you have never programmed before. You will start slowly and build on what you have learned in subsequent chapters. So take a deep breath, let it out slowly, and tell yourself you can do this. No sweat! No kidding!

Programming a computer is a lot like teaching a child to tie his shoes. Until you find the correct way of giving the instructions, not much is accomplished. Visual Basic 2010 is a language you can use to tell your computer how to do things; but, like a child, the computer will understand only if you explain things very clearly. If you have never programmed before, this sounds like an arduous task, and sometimes it can be. However, Visual Basic 2010 offers an easy-to-use language to explain some complex tasks. Although it never hurts to have an understanding of what is happening at the lowest levels, Visual Basic 2010 frees the programmer from having to deal with the mundane complexities of writing Windows applications. You are free to concentrate on solving real problems.

Visual Basic 2010 helps you create solutions that run on the Microsoft Windows operating systems, such as Windows 7, Windows Server 2008, and Windows Mobile 6.1. If you are looking at this book, you might have already felt the need or desire to create such programs. Even if you have never written a computer program before, as you progress through the Try It Out exercises in this book, you will become familiar with the various aspects of the Visual Basic 2010 language, as well as its foundations in the Microsoft .NET Framework. You will find that it is not nearly as difficult as you imagined. Before you know it, you will feel quite comfortable creating a variety of different types of programs with Visual Basic 2010.

Visual Basic 2010 can also be used to create web applications and web services, as well as mobile applications that can run on Pocket PCs or smartphones. However, you will begin by focusing on Windows applications before extending your boundaries to other platforms.

Event-Driven Programming

A Windows program is quite different from yesteryear's MS-DOS program. A DOS program follows a relatively strict path from beginning to end. Although this does not necessarily limit the functionality of the program, it does limit the road the user has to take to get to it. A DOS program is like walking down a hallway; to get to the end you have to walk down the entire hallway, passing any obstacles that you may encounter. A DOS program would only let you open certain doors along your stroll.

Windows, on the other hand, opened up the world of *event-driven programming*. *Events* in this context include clicking a button, resizing a window, or changing an entry in a text box. The code that you write responds to these events. In terms of the hallway analogy: In a Windows program, to get to the end of the hall you just click the end of the hall. The hallway itself can be ignored. If you get to the end and realize that is not where you wanted to be, you can just set off for the new destination without returning to your starting point. The program reacts to your movements and takes the necessary actions to complete your desired tasks.

Another big advantage in a Windows program is the *abstraction of the hardware,* which means that Windows takes care of communicating with the hardware for you. You do not need to know the inner workings of every laser printer on the market just to create output. You do not need to study the schematics for graphics cards to write your own game. Windows wraps up this functionality by providing generic routines that communicate with the drivers written by hardware manufacturers. This is probably the main reason why Windows has been so successful. The generic routines are referred to as the Windows *application programming interface (API)*, and most of the classes in the .NET Framework take care of communicating with those APIs.

Before Visual Basic 1.0 was introduced to the world in 1991, developers had to be well versed in C and C++ programming, as well as the building blocks of the Windows system itself, the Windows API. This complexity meant that only dedicated and properly trained individuals were capable of turning out software that could run on Windows. Visual Basic changed all of that, and it has been estimated that there are now as many lines of production code written in Visual Basic as in any other language.

Visual Basic changed the face of Windows programming by removing the complex burden of writing code for the user interface (UI). By allowing programmers to *draw* their own UI, it freed them to concentrate on the business problems they were trying to solve. When the UI is drawn, the programmer can then add the code to react to events.

Visual Basic has also been *extensible* from the very beginning. Third-party vendors quickly saw the market for reusable modules to aid developers. These modules, or *controls*, were originally referred to as VBXs (named after their file extension). Prior to Visual Basic 5.0, if you did not like the way a button behaved, you could either buy or create your own, but those controls had to be written in C or C++. Database access utilities were some of the first controls available. Version 5 of Visual Basic introduced the concept of *ActiveX*, which enabled developers to create their own *ActiveX controls*.

When Microsoft introduced Visual Basic 3.0, the programming world changed significantly. Now you could build database applications directly accessible to users (so-called *front-end applications*) completely with Visual Basic.