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Microsoft Visual C# 2012

John Sharp



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Step by Step



Microsoft Visual C# 2012 Step by Step

Your hands-on, step-by-step guide to the fundamentals of Visual C# development.

Teach yourself how to build applications with Microsoft Visual C# 2012 and Visual Studio® 2012—one step at a time. Ideal for those with fundamental programming skills, this tutorial provides practical, learn-by-doing exercises for mastering core C# language features and creating working applications and components for Windows®.

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About the Author

John Sharp is an expert on developing applications with the Microsoft .NET Framework and interoperability issues. He has coauthored guides for the Microsoft Patterns and Practices group, and is the author of *Microsoft Visual C# 2010 Step by Step* and *Microsoft Windows Communication Foundation Step by Step*.

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John Sharp

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I dedicate this book to Diana, my wife and fellow Warwickshire supporter, for keeping me sane and giving me the perfect excuse to spend time watching cricket.

—JOHN SHARP

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Introduction

Microsoft Visual C# is a powerful but simple language aimed primarily at developers creating applications by using the Microsoft .NET Framework. It inherits many of the best features of C++ and Microsoft Visual Basic, but few of the inconsistencies and anachronisms, resulting in a cleaner and more logical language. C# 1.0 made its public debut in 2001. The advent of C# 2.0 with Visual Studio 2005 saw several important new features added to the language, including generics, iterators, and anonymous methods. C# 3.0, which was released with Visual Studio 2008, added extension methods, lambda expressions, and most famously of all, the Language-Integrated Query facility, or LINQ. C# 4.0, released in 2010, provided further enhancements that improved its interoperability with other languages and technologies. These features included support for named and optional arguments, and the *dynamic* type, which indicates that the language runtime should implement late binding for an object. An important addition in the .NET Framework released concurrently with C# 4.0 was the classes and types that constitute the Task Parallel Library (TPL). Using the TPL, you can build highly scalable applications that can take full advantage of multicore processors quickly and easily. C# 5.0 adds native support for asynchronous task-based processing through the *async* method modifier and the *await* operator.

Another key event for Microsoft has been the launch of Windows 8. This new version of Windows supports highly interactive applications that can share data and collaborate with each other as well as connect to services running in the cloud. The development environment provided by Microsoft Visual Studio 2012 makes all these powerful features easy to use, and the many new wizards and enhancements included in Visual Studio 2012 can greatly improve your productivity as a developer. The combination of Visual Studio 2012, Windows 8, and C# 5.0 provides a comprehensive platform and toolset for building the next generation of powerful, intuitive, and portable applications. However, even if you are not using Windows 8, Visual Studio 2012 and C# 5.0 have much to offer, and they form an invaluable partnership for helping you to build great solutions.

Who Should Read This Book

This book assumes that you are a developer who wants to learn the fundamentals of programming with C# by using Visual Studio 2012 and the .NET Framework version 4.5. By the time you complete this book, you will have a thorough understanding of C# and

will have used it to build responsive and scalable Windows Presentation Foundation (WPF) applications that can run on both Windows 7 and Windows 8.

You can build and run C# 5.0 applications on Windows 7 and Windows 8, although the user interfaces provided by these two operating systems have some significant differences. Consequently, Parts I to III of this book provide exercises and worked examples that will run in both environments. Part IV focuses on the application development model used by Windows 8, and the material in this section provides an introduction to building interactive applications for this new platform.

Who Should Not Read This Book

This book is aimed at developers new to C#, and as such, it concentrates primarily on the C# language. This book is not intended to provide detailed coverage of the multitude of technologies available for building enterprise-level applications for Windows, such as ADO.NET, ASP.NET, Windows Communication Foundation, or Workflow Foundation. If you require more information on any of these items, you might consider reading some of the other titles in the Step by Step for Developers series available from Microsoft Press, such as *Microsoft ASP.NET 4 Step by Step*, *Microsoft ADO.NET 4 Step by Step*, and *Microsoft Windows Communication Foundation 4 Step by Step*.

Organization of This Book

This book is divided into four sections:

- Part I, "Introducing Microsoft Visual C# and Microsoft Visual Studio 2012," provides an introduction to the core syntax of the C# language and the Visual Studio programming environment.
- Part II, "Understanding the C# Object Model," goes into detail on how to create and manage new types by using C#, and how to manage the resources referenced by these types.
- Part III, "Defining Extensible Types with C#," includes extended coverage of the elements that C# provides for building types that you can reuse across multiple applications.
- Part IV, "Building Professional Window 8 Applications with C#," describes the Windows 8 programming model, and how you can use C# to build interactive applications for this new model.

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