Beginning Programming

ALL-IN-ONE DESK REFERENCE

FOR DUMMIES®

by Wallace Wang

Wiley Publishing, Inc.

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About the Author

I started off as a writer and wound up becoming a computer programmer. Then I wound up circling around again to become a writer about computers. I've spent most of my life writing about and programming a variety of personal computers ranging from an ancient PC running MS-DOS 1.25 to Windows XP PC to the latest Macintosh computer running Mac OS X Leopard. My only preference for any computer is to use one that works.

I first learned about programming from my high school's ancient teletype terminal that connected to a mainframe computer through a 300 baud acoustic modem that often disconnected me in the middle of my BASIC programming sessions. At the time, I didn't know much about programming. I just taught myself BASIC from a book and illegally gained access to the teletype terminal by using somebody else's password. Later in the year, I actually signed up for a computer class and finally gained legitimate access to the teletype terminal to do everything I had been doing illegally long before.

The first time I wrote a BASIC program on my own, it was a game that simulated flying a nuclear-armed bomber through a variety of anti-aircraft defenses including surface-to-air missiles and jet fighters trying to shoot you down. When this program worked for the first time, I felt like Dr. Frankenstein watching his creation twitch and come to life. To this day, I still experience that same feeling of exhilaration in creating something from an idea and turning it into an actual working program. Only other programmers can understand this strange sense of power and elation that comes from a working program, and it's this same sense of wonder and exploration that I hope you'll experience as you use this book to explore the world of programming on your own computer.

I may be considered a computer veteran after all these years, but that doesn't mean that I can't still experience that same feeling of satisfaction in typing that final command and watching an entire program work exactly as I wanted. Although I've written plenty of other books both on computers *(Microsoft Office 2007 For Dummies)* and far away from computers altogether *(Breaking Into Acting For Dummies),* I find that programming still fascinates me to this day.

As an author, I hope to help you discover your own path to learning programming, and as a programmer, I hope to provide an overview of computer programming in general. You may not become an expert programmer after reading this book, but if you come away with a greater appreciation for programming, then I'll know I'll have fulfilled my duty as both an author and programmer for this.

Dedication

This book is dedicated to anyone who wants to learn how to program a computer. Computer programming can be one of the most creative ways to express your ideas so if you have your heart set on writing programs for fun or profit, you've just joined a select group of fellow renegades, entrepreneurs, and hobbyists who find programming an enjoyable intellectual exercise. When lost in the world of programming, you can often elevate your spirit to lofty heights of pleasure and wind up crashing right back down to Earth again when a single syntax error causes your program to crash an entire computer. Welcome to the wonderful world of programming. You deserve to achieve whatever your mind can envision and your programming skills can create.

Acknowledgments

This is the part of the book that most people skip over since it usually lists a bunch of names that most people have never heard before, so before you can skip over this page, I'd like to thank you for buying (or at least reading) this book. If you're interested in learning to program a computer, you've already separated yourself from the masses who are ecstatic when they can just get their computer to work in the first place. As a programmer, you have the power to control how people may use computers in the future, and this power can give you the chance to help others or make someone completely helpless in their agony when trying to use a computer, so use your programming skills wisely.

On another note, this book owes part of its existence to Bill Gladstone and Margot Hutchison at Waterside Productions and another part of its existence to Katie Feltman at Wiley Publishing for turning this project into reality. Some other people who helped shape this project include Pat O'Brien and Vince McCune.

I also want to acknowledge all the stand-up comedians I've worked with over the years including Darrell Joyce (http://darrelljoyce.com), Leo "the Man, the Myth, the Legend" Fontaine, Chris Clobber, Bob Zany (`www.bobzany.com`), Russ Rivas (`http://russrivas.com`), Don Learned, Dante, and Dobie "The Uranus King" Maxwell. Another round of thanks goes to Steve Schirripa (who appeared in HBO's hit show "The Sopranos") for giving me my break in performing at the Riviera Hotel and Casino in Las Vegas, one of the few old-time casinos that hasn't been blown up to make way for yet another luxury hotel and casino targeting rich people who want to lose their money faster.

Additional acknowledgements also go to my fellow radio co-hosts: Rick Gene, Drizz, Justin Davis, and Dane Henderson, who shared the airwaves with me during our year at 103.7 FreeFM in San Diego. Having our own radio show gave us all an excuse to go places and do things that we wouldn't normally get to do such as visiting a UFO cult that built a landing strip for a flying saucer, exploring a museum that promotes creationism, and visiting Comic-Con where people dress up as their favorite comic book super heroes. (I tried to give ten bucks to anyone who would let me pour gasoline on them and light a match so they could attend Comic-Con dressed up as the Human Torch, but nobody was willing to take me up on that offer.)

I'd also like to acknowledge Cassandra (my wife) and Jordan (my son) for putting up with my long hours and my insistence that everyone dump their Windows XP PCs right away (an easy decision since they never worked right anyway) and migrate completely to the Macintosh. Final thanks go to Bo, Scraps, and Nuit (my cats) along with a final farewell to Tasha, who was a special breed called a Korat. R.I.P.

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Introduction

If you enjoy using a computer, you may have even more fun learning to control a computer by writing your own programs. To learn how to program a computer, you need to understand three different subjects.

First, you have to understand that computer programming is nothing more than problem solving. Before you even think about writing a program, you need to know what problem you want your program to solve and how it will solve it.

Second, you need to learn the basic ideas behind computer programming in general. Although programming a Windows computer is different from programming a Macintosh or a super computer, the general principles are the same. By learning what these common programming principles are and why they exist, you can learn different ways to tell a computer what to do, step-by-step.

Finally, you also need to learn a specific programming language. A programming language represents just one way to express your ideas in a language that the computer can understand. By combining your knowledge of a programming language with programming principles and the type of problem you want the computer to solve, you can create your own computer programs for fun or profit.

Who Should Buy This Book

If you have any interest in programming but don't know where to start, this book can give you a nudge in the right direction. You won't learn how to write programs in a specific programming language, but you'll learn the basics about computer programming so you'll have no trouble learning more on your own.

If you already know something about programming, this book can still help you learn more by introducing you to the variety of programming languages available and make it easy for you to learn different programming languages quickly. The more you understand the advantages and disadvantages of different programming languages, the better you'll be able to choose the language that's best suited for a particular task.

Whether you're a novice or an intermediate programmer, you'll find this book can work as a tutorial to teach you more and as a reference to help refresh your memory on programming topics you may not normally use

everyday. This book won't turn you into an expert overnight, but it will open the doors to more information about programming than you might have ever known even existed.

How This Book Is Organized

To help you learn about computer programming, this book is divided into several minibooks where each minibook is self-contained so you can read them in any order you wish.

Book I: Getting Started

This first book provides a general overview of computer programming. This is where you'll learn how programming evolved, the latest techniques to make programming faster and easier, how different programming languages work, what type of tools programmers use, and how programmers create large projects. This book gives you a broad understanding of programming so you'll understand how programming solves different types of problems.

Book II: Programming Basics

No matter what type of computer you want to program or which programming language you use, programming follows the same basic principles and this book explains how they work. This is where you'll learn the parts of a typical program and how they work to create a working program. This book also explains the purpose of a user interface and the elements that make up a user interface.

Book III: Data Structures

All programs manipulate data, which means they need a way to store that data temporarily in something called a data structure. Data structures form the heart of any program. Think of data structures as closets or drawers for holding information. Depending on the type of information you need to store and how you need to use it, you may need to use different types of data structures. By understanding the different data structures available and the pros and cons of each, you'll learn the best type of data structure to use for your particular program.

Book IV: Algorithms

An algorithm is just a specific method for solving a problem. There are literally an infinite number of ways to solve any problem, but computer programmers generally run into the same type of problems over and over, which

means they've also discovered the most efficient algorithms to solve for specific tasks. This book introduces different types of algorithms and explains how they work and when you might want to use them.

Book V: Web Programming

Traditional programs run on a computer, but the advent of the Internet has created a new field of programming known was Web programming. Instead of running on a single computer, Web programs are stored on one computer (called a server) but run and displayed on a second computer (called a client). If you've ever ordered anything off the Internet, you've used a program designed to run on Web pages. Learning Web programming isn't hard, but it often requires using different types of languages and techniques, which is what you'll learn about in this book.

Book VI: Programming Language Syntax

This book explains the basic features of programming languages and then shows how different programming languages implement those features, which is known as the language syntax. Knowing the syntax of different languages can show you the flaws and benefits of each language so you'll know when to use a particular language over another. If you regularly need to program in different languages, this book makes a handy reference to show you how to accomplish a specific task in different languages along with showing you unusual features that appear in one programming language but not in another one.

Book VII: Applications

Knowing how to program a computer is nice, but ultimately useless if you don't know how to apply your programming skills to doing something productive, so this book explains several fields of computer programming. By reading this book, you can learn what types of programming appeals to you. By combining your knowledge of programming with a particular field of interest, you can carve a niche for yourself in any field you choose.

How to Use This Book

You can use this book as a tutorial or a reference. Although you can just flip through this book to find the information you need, programming novices should start with Book I before tackling any other books. After you understand the basics of programming from Book I, then you can freely jump around to read only the information that interests you.

Icons Used in This Book

Icons highlight important or useful information that you might want to know about.

This highlights information that can save you time or make it easier for you to do something.

This icon emphasizes information that can be helpful, though not crucial, when writing a program.

Look out! This icon highlights something dangerous that you need to avoid before making an irreversible mistake that could make you curse your computer forever.

This icon highlights interesting technical information that you can safely ignore, but which might provide additional background about programming a computer.

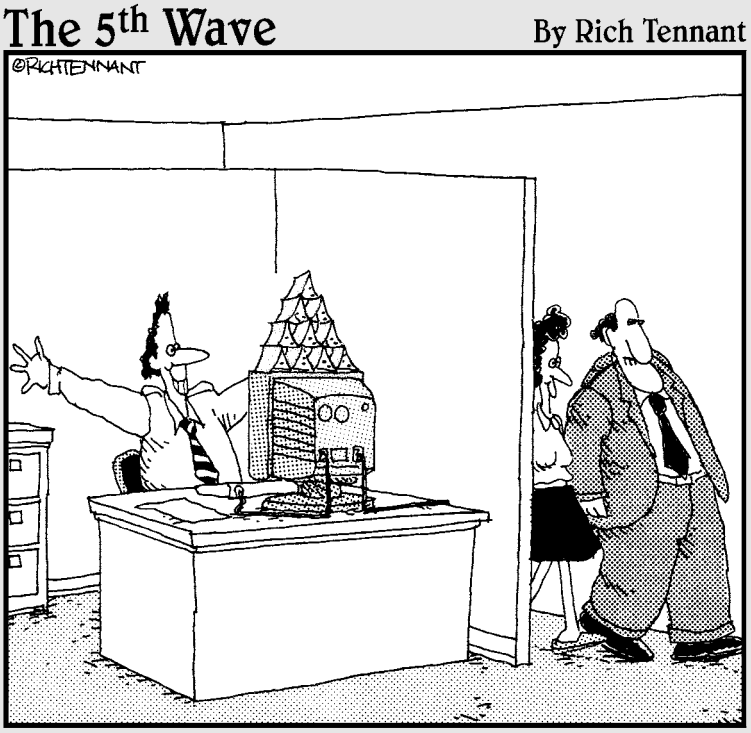
Getting Started

The best way to learn anything is to jump right in and not be afraid to make mistakes. To learn programming, you'll need access to a computer and a way to write programs in a particular programming language. You won't learn specific programming techniques in this book. Instead, you'll learn a lot about a wide variety of programming topics so you'll be in a better position to decide what you need to learn next.

Programming is more than learning a particular programming language or even knowing how to program a particular type of computer. Basically, programming is about tackling difficult problems and breaking them down into smaller problems until you solve one big problem. If you like the idea of solving problems, then you'll find this may be the perfect book to introduce you to the wonderful world of computer programming.

Book I

Getting Started



"Why, of course. I'd be very interested in seeing this new milestone in the project."

Contents at a Glance