Part

I
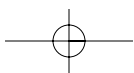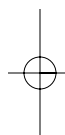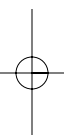
Learning to Program

CHAPTER

1

Programming for World of Warcraft

James Whitehead II

World of Warcraft (WoW) was released in November 2004 and has quickly become the model for Massively Multiplayer Online Role Playing Games (MMORPG). Providing an intuitive user interface and a low barrier to success, more than ten million users currently play the game with their friends, co-workers, and family. WoW provides something for the players who spend six hours a night with their guilds, the cubicle warriors who play for half an hour a day on their lunch breaks, and a large range in between.

Beyond the gameplay itself, a meta-game has formed around customizing the user interface and writing elaborate macros for the game. Blizzard provides an extremely powerful system for creating third-party addons, and programmers have been taking advantage of the open system since the beta test for the game. This book is designed to teach you how to create these custom addons.

Customizing the User Interface

The World of Warcraft game client consists of two major parts: the game world and the user interface. The game world is the three-dimensional world in which your character resides. This includes the buildings and terrain, other players, and interactive objects such as herbs, mining veins, and signposts. The game world also includes the character names that are displayed above other players. These elements are not accessible through the scripting interface and cannot be modified.

The user interface comprises the other elements of the game client, including the action buttons, unit frames, maps, and options windows. Addons are written to add to or modify existing elements to add functionality, or show information in a different way.

How Do Addons Work?

An addon is simply a folder that resides in your World of Warcraft directory, consisting of text files, images, sounds, and fonts. These addons are loaded by the client and run within its scripting system. This definition of addons does not include any third-party executables that are run outside the game (these sorts of programs are prohibited by WoW's terms of services). Addons use only the scripting interface that is provided to developers, and are run by the game itself.

The average addon consists of several individual components that work together to create a final product, including:

- A table of contents file to identify the addon and its components
- Media files, such as graphics and sounds
- Lua scripts that define the behavior of the addon
- XML files that define the visual elements (frames) of your addon

The first part of this book takes you through each of these components, giving you the tools and skills you will need to write addons effectively.

What Can Addons Do?

As a general rule, addons are allowed to display any information available to the game client to enable the user to make well-informed decisions. They can visually alter the user interface in many ways, although there are limitations on how they can change the behavior of that interface.

Prior to the release of the Burning Crusade expansion pack, there were several addons that Blizzard deemed against the spirit of the game. These addons were later disabled with changes to the way they interact with the game client. The following actions are unavailable to addons:

- Automatic character movement
- Automatic target selection
- Automatic selection and use of spells or items
- Real-time communication with external programs

In addition, addons are unable to provide a way for Horde to speak with Alliance, or vice versa. This is prohibited through the World of Warcraft "Terms of Use" (http://www.worldofwarcraft.com/legal/termsofuse.html).

Getting Started with Lua

The Lua programming language was designed and implemented at the Pontifical Catholic University of Rio de Janeiro in Brazil. Lua is a powerful, lightweight, embedded scripting language that is used in several large software projects, including WoW.

The first five chapters of this book introduce you to the Lua programming language through a series of interactive examples. While these examples should be easy to understand without you needing to run them, we strongly encourage you to download a Lua interpreter so you can run through the examples on your own. In addition, an interpreter allows you to easily explore the language to increase your overall understanding of concepts.

There are three easy ways to obtain a Lua interpreter:

1. Download WowLua, an addon the authors have written that gives you an interactive Lua interpreter within World of Warcraft.

2. Visit the book's website at `http://wowprogramming.com/utils/weblua` to use an interactive Lua interpreter within your web browser.

3. Download a Lua interpreter onto your computer, so it can be run locally without access to the Internet or WoW.

Downloading and Installing WowLua

For the purposes of this book, we have created a version of the Lua interpreter that runs as an addon within World of Warcraft. This is the simplest way to install a Lua interpreter for anyone with experience using addons. It also has the advantage of letting you work within the game, allowing you to test your work on-the-fly, experiment with the default UI and other addons, and still be able to chat with your friends and guild.

Navigate to `http://wowprogramming.com/addons/wowlua` and click the download link to get the latest version of the WowLua addon. This will download a .zip file to your computer. Once you save the file, you can extract it using your favorite compression utility or by double-clicking it on a standard Windows XP or Mac OS X machine. A single folder called `WowLua` will be extracted. Place the folder in the `Interface\AddOns` folder underneath your World of Warcraft installation.

You can verify that the addon is installed properly by clicking the Addons button in the bottom-left corner of your character selection screen. You should see the addon listed in a fashion similar to that shown in Figure 1-1.

Figure 1-1: WowLua in the addon listing

Select a character and log in to the game. Type either `/lua` or `/wowlua` into the chat box to open the WowLua window (see Figure 1-2). You can close the window by clicking the X button in the top-right corner, or by pressing the Esc key.

Figure 1-2: WowLua interactive interpreter

Using Lua on the Web

For those people who don't want to run these examples within WoW and have access to an Internet connection, we've created a simple webpage that serves as a Lua interpreter over the web, called WebLua. Simply browse to `http://wowprogramming.com/utils/weblua` to begin.

Downloading and Installing a Lua Interpreter

If you prefer to download an interpreter so you can work offline, downloadable packages are available for both Microsoft Windows and Mac OS X.

Microsoft Windows

The interpreter for Microsoft Windows can be downloaded at `http://wowprogramming.com/downloads/lua/windows`. The package doesn't require any installation; you can simply place it anywhere that is convenient for you. Extract the ZIP file to a new folder and place it where you can easily find it again.

To launch the Lua interpreter, go to the files you've extracted and double-click the icon for the interpreter. This opens a window that looks something like that shown in Figure 1-3. You can also create a shortcut to this file from which you can launch the interpreter.
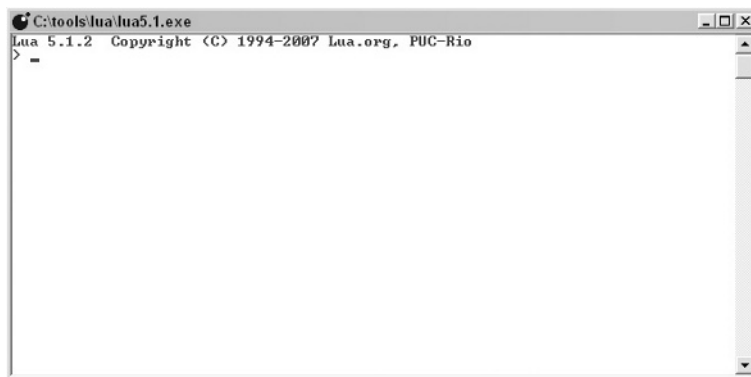
Figure 1-3: Lua running on Microsoft Windows

Mac OS X

A Lua interpreter for Mac OS X can be found at http://wowprogramming.com/downloads/lua/macosx. The download is a standard disk image that can be mounted on your system. To mount it, navigate to the disk image and double-click it. From the new volume, simply copy the Lua interpreter application somewhere on your machine that you will remember (the Applications folder may be a good location).

To launch the Lua interpreter, navigate to the file you downloaded and extracted, and double-click the icon. A window similar to that shown in Figure 1-4 should appear. There is no setup program to run and the application can be run from anywhere.
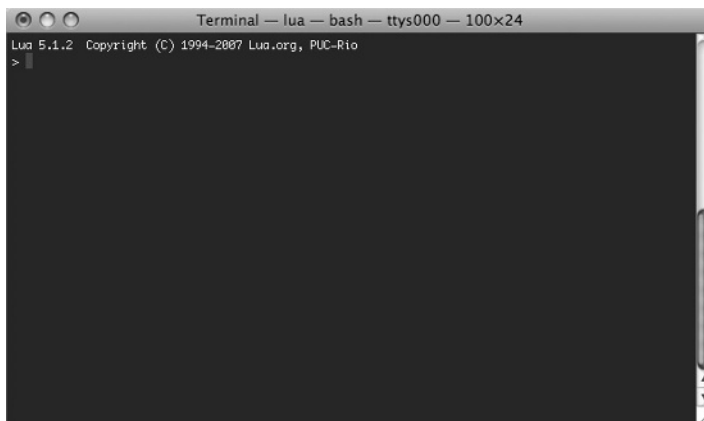
Figure 1-4: Lua running on Mac OS X

Exploring Your Lua Interpreter

Now that you have Lua installed on your system, fire up whichever interpreter you've chosen. You should be presented with a prompt (>). Type the command `print("Hello Azeroth!")` and then press Enter (Return). You should see something similar to this in your window:

```
> print("Hello Azeroth!")
Hello Azeroth!
>
```

You've just successfully run your first Lua script! The next few chapters show you what exactly this command does, but the simple test shows you have the basics you need to run everything presented in Part I of this book.