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Resourceful Code Reuse

Write → Compile → Link → Run

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The
Pragmatic
Programmers

Resourceful Code Reuse

*Write → Compile →
Link → Run*

Dmitry Zinoviev
edited by Adaobi Obi Tulton



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The team that produced this book includes:

CEO: Dave Rankin

COO: Janet Furlow

Managing Editor: Tammy Coron

Development Editor: Adaobi Obi Tulton

Copy Editor: Corina Lebegioara

Founders: Andy Hunt and Dave Thomas

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Preface

I took my first and only academic course in software engineering in the fall of 1994. The course was taught by Professor Peter Henderson, who had spent a quarter of a century at Stony Brook University and retired shortly after my graduation. The course was taught in Smalltalk, the mother of all object-oriented languages, and was undeniably excellent. Sadly, I have never had another chance to write a line of code in Smalltalk and barely remember what it looked like.

What I do remember is the mantra that Professor Henderson recited over and over again, until it got imprinted into my mind, from the top of my head to my fingertips: “Thou shalt use make files and reuse your code.” Ever since, I’ve started every new non-trivial project by writing a makefile and spending a ridiculous amount of time dissecting the job into potentially reusable units. In this book, I want to share with you my passion for code reuse and code organization and the skills that support that passion.

About the Reader

This book is mainly intended for beginner through intermediate software developers in C and, to a much lesser extent, in Python, who want to achieve higher productivity, better code quality, and more flexible and adaptable products by reusing and organizing previously written code. Experience with command-line software development tools is helpful but not required.

About the Book

After the mandatory introduction that sets the scene for the story, the book goes over three stages of small project development: editing (producing the project’s text in a programming language), compiling (converting the text into object files with machine code), and linking (combining the pre-compiled object files into one executable program file). Any unit produced at any stage can be reused and shared at a later stage, including the runtime when there is no more development. The rest of the book is organized into three chapters

focused on these topics: compile-time reuse, link-time reuse, and runtime reuse.

I tried to keep the chapters as independent as possible but still ended up with some backward and forward references. The forward references are not so essential for understanding the material, but if you open the book in the middle and come across a backward reference that you do not recognize, I strongly suggest visiting it.

About the Software

To compile and run the C examples mentioned in the book, you need a decent C compiler (gcc is the best, but Intel and Microsoft would probably work, too) and a set of C development tools: maker (make), linker (ld), file, strip, ldd, and ranlib. The GNU development toolset works marvels; other toolsets may or may not work. All examples in the book have been tested on a Linux computer but will most likely work on macOS.

For the Python examples, a Python-3.x interpreter (python) is all you want. No third-party modules are required.

Shall we start?

Dmitry Zinoviev

dzinoviev@gmail.com

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