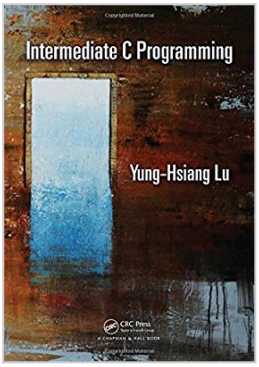

Intermediate C Programming

By Yung-Hsiang Lu

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Teach Your Students How to Program Well

Intermediate C Programming provides a stepping-stone for intermediate-level students to go from writing short programs to writing real programs well. It shows students how to identify and eliminate bugs, write clean code, share code with others, and use standard Linux-based tools, such as ddd and valgrind.

The text covers numerous concepts and tools that will help your students write better programs. It enhances their programming skills by explaining programming concepts and comparing common mistakes with correct programs. It also discusses how to use debuggers and the strategies for debugging as well as studies the connection between programming and discrete mathematics.

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Intermediate C Programming By Yung-Hsiang Lu Bibliography

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Editorial Review

Review
George Hacken, ACM Computing Reviews, December 2, 2015

(Added by the author. Amazon limits the lengths to 4,000 characters so some parts of the original review were omitted.)

...
Lu's book stands out, among the very large number of extant C books, as one of the few arguably indispensable works that promote genuine mastery of this powerful procedural programming language. An erstwhile prominent aerospace colleague and C expert, Dr. (of physics) Graham Frye, came to mind when I initially perused this book: Grahamoccasionally wore a "Syntax is destiny" shirt, to which I invariably reacted with "Don't forget semantics!" This book demonstrates consummate craftsmanship in treating both of these pillars of today's C, as its sturdy and steady focus is, to an extent that I've rarely if ever seen, on the language itself. ...
The four parts, comprising 24 chapters, are preceded by an essentially one-page explication of "Rules in Software Development." I think that, in the proverbial perfect world, every aspiring, experienced, or veteran software developer should read and practice these rules, which alone are worth the price of this book. The first rule is, "99.9% success is failure." The last is, "No tools replace a clear mind. ... If you want to be a good software developer, then you need to understand every detail." (The book makes good on that, given the reader's due diligence.) ... I am, furthermore, safe in assuming (non-falsifiably) the late E. W. Dijkstra's forgiveness for some "operational thinking" (also known as "playing computer") that this book can in places and of necessity induce, the forgiveness presumably stemming from the book's rigor, precision, and general excellence.
The 11-chapter Part 1, "Computer Storage: Memory and File," includes chapters and sections on compilation and execution; stack memory; preventing, detecting, and removing bugs; pointers in C; program writing, "make"-ing, and testing; strings, with programming examples in their use; the C Library; heap storage and programming problems engendered by its use; reading and writing files; and exercises (programming problems).
I believe Algol 60 to be the first procedural, application-programming language to have supported recursion, and consequently to have empowered high-level-language application programming immeasurably. (Dijkstra's impetus figured large in that "feature's" inclusion in Algol.)
The four chapters comprising Part 2, "Recursion," treat this perennially difficult and subtle algorithmic facility most clearly and completely. Chapter 12, "Recursion," provides top-level ideas of challenges where recursive solutions could (and should) be applied, whilst Part 2's remaining three chapters treat these and more somewhat recursively (my bad pun). The stack, a most fundamental data structure for which C supplies almost natural push and pop instructions, is given its due and then some. And the always-tricky Tower of Hanoi is superbly explicated, using well-explained recursive C functions that show the power of C in this area.
Part 3, "Structures," is composed of six chapters that explicate programmer-defined types; a detailed treatment of linked lists and the binary search-tree; a pleasantly surprising (to me) exposition of parallel programming, featuring multi-tasking and POSIX threads; and Amdahl's Law: "Adding more threads has diminishing returns." Part 3 is the best to-the point and hands-on treatment of practical parallel programming that I've encountered.
Part 4, "Applications, " puts the lessons of Parts 1, 2, and 3 together in applying non-trivial, ultra-instructive maze, image-processing, and (Huffman) encoding algorithms that map ubiquitously to real-life problems. It

may give me the courage to confront, for example, image compression prior to reading a whole book on the subject.
...
If, in analogy with the TV series "Lost," you land on a desert island that has a Linux computer, this is the one book to have with you.

"Two features are notable. First, a crucial element of the book, elaborated early and in great detail, is the description of the program calling stack. This is an excellent pedagogical approach: a thorough understanding of how the calling stack is built and used goes a long way in ensuring that the programmer has a firm grasp of the design process, and it also plays a crucial role in tracing the location of errors. And second, many topics are accompanied by discussions of potential pitfalls and remedial strategies. …quite beneficial to novice programmers, the intended audience. It could also be used for professional development in class or by the independent reader."
?Edgar R. Chavez, in *Computing Reviews*

"… an excellent entryway into practical software development practices that will enable my beginning and even advanced students to be more productive in their day-to-day work by avoiding typical mistakes and by writing cleaner code … I wished I had this book some 20 years ago … the hands-on examples … are eye opening. I recommend this book to anyone who needs to write software beyond the tinkering level."
?From the Foreword by Gerhard Klimeck, Reilly Director of the Center for Predictive Materials and Devices and the Network for Computational Nanotechnology and Professor of Electrical and Computer Engineering, Purdue University; Fellow of the IOP, APS, and IEEE

"**Intermediate C Programming** bridges that critical gap between beginner and expert with clear examples in key areas. This book covers important concepts we use every day in industry when developing and debugging code."
?Harald Smit, Software Manager

"Higher order cognition occurs when one can analyze disparate parts of problems and issues or perform complicated operations. But advanced, critical thinking requires an assessment of how negative consequences can be avoided. In computer programming education, the leap between beginner-level recognition of syntax and artful, efficient language authoring occurs only when a student can regularly identify and predict likely errors in authored code. **Intermediate C Programming** provides essential lessons and practice in error analysis. By prioritizing debugging into each lesson, the author compels learners to consider the consequences of coding choices, one block at a time."
?David B. Nelson, Ph.D., Associate Director, Center for Instructional Excellence, Purdue University

"This well-written book provides the necessary tools and practical skills to turn students into seasoned programmers. It not only teaches students how to write good programs, but, more uniquely, also teaches them how to avoid writing bad programs. The inclusion of Linux operations and Versioning control as well as the coverage of applications and IDE build students’ confidence in taking control over large-scale software developments. At the end of this learning journey, students will possess the skills for helping others to debug their programs, an important step for building a new generation of programmers who are able to help one another in software development."
?Siau Cheng Khoo, Ph.D., National University of Singapore

"This book is unique in that it covers the C programming language from a bottom-up perspective, which is rare in programming books. Instead of starting with the high-level concepts, which easily get dry and uninspiring for students, the book begins with practical problems and progressively introduces the C concepts necessary to solve those problems. This means that students immediately understand how the language works from a very practical and pragmatic perspective."
?Niklas Elmqvist, Ph.D., Associate Professor and Program Director, Master of Science in Human–Computer Interaction, University of Maryland

From the Author
This book is unique in many ways.

- It is written based on research about learning: people learn from correct examples as well as mistakes. The book includes common mistakes and explains why they are wrong. The book explains some subtle mistakes that can be difficult to detect. The book further provides systematic methods to prevent, detect, and remove these mistakes.
- It is written for readers of different learning styles. The book has 123 figures so that visual thinkers can understand programming more easily.
- It provides thorough examination of recursion, a topic that is often treated superficially in other books. The book has many examples offering different views (code, stack memory, visualization) about recursion. The book also explains situations when recursion can be beneficial and when recursion should not be used.
- It teaches many programming tools, including debugger, visualization of data structures, test coverage, performance profiling, and detecting memory errors.

About the Author

Yung-Hsiang Lu is an associate professor in the School of Electrical and Computer Engineering at Purdue University. He is an ACM Distinguished Scientist and ACM Distinguished Speaker. He received a Ph.D. from the Department of Electrical Engineering at Stanford University.

Users Review

From reader reviews:

Arthur Walker:

Do you one of people who can't read enjoyable if the sentence chained within the straightway, hold on guys this aren't like that. This Intermediate C Programming book is readable by simply you who hate the straight word style. You will find the facts here are arrange for enjoyable reading experience without leaving even decrease the knowledge that want to supply to you. The writer connected with Intermediate C Programming content conveys objective easily to understand by lots of people. The printed and e-book are not different in the information but it just different such as it. So , do you still thinking Intermediate C Programming is not loveable to be your top listing reading book?

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Spent a free the perfect time to be fun activity to do! A lot of people spent their sparetime with their family,

or their particular friends. Usually they carrying out activity like watching television, gonna beach, or picnic inside the park. They actually doing same thing every week. Do you feel it? Do you wish to something different to fill your free time/ holiday? Could be reading a book might be option to fill your free of charge time/ holiday. The first thing that you will ask may be what kinds of book that you should read. If you want to test look for book, may be the book untitled Intermediate C Programming can be excellent book to read. May be it is usually best activity to you.

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