Elements of Programming

Alexander A. Stepanov, Paul McJones

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"Ask a mechanical, structural, or electrical engineer how far they would get without a heavy reliance on a firm mathematical foundation, and they will tell you, 'not far.' Yet so-called software engineers often practice their art with little or no idea of the mathematical underpinnings of what they are doing. And then we wonder why software is notorious for being delivered late and full of bugs, while other engineers routinely deliver finished bridges, automobiles, electrical appliances, etc., on time and with only minor defects. This book sets out to redress this imbalance. Members of my advanced development team at Adobe who took the course based on the same material all benefited greatly from the time invested. It may appear as a highly technical text intended only for computer scientists, but it should be required reading for all practicing software engineers."
   —Martin Newell, Adobe Fellow

 "The book contains some of the most beautiful code I have ever seen."
   —Bjarne Stroustrup, Designer of C++

"I am happy to see the content of Alex's course, the development and teaching of which I strongly supported as the CTO of Silicon Graphics, now available to all programmers in this elegant little book."
   —Forest Baskett, General Partner, New Enterprise Associates

"Paul's patience and architectural experience helped to organize Alex's mathematical approach into a tightly-structured edifice—an impressive feat!"
   —Robert W. Taylor, Founder of Xerox PARC CSL and DEC Systems Research Center

Elements of Programming provides a different understanding of programming than is presented elsewhere. Its major premise is that practical programming, like other areas of science and engineering,must be based on a solid mathematical foundation. The book shows that algorithms implemented in a real programming language, such as C++, can operate in the most general mathematical setting. For example, the fast exponentiation algorithm is defined to work with any associative operation. Using abstract algorithms leads to efficient, reliable, secure, and economical software.

This is not an easy book. Nor is it a compilation of tips and tricks for incremental improvements in your programming skills. The book's value is more fundamental and, ultimately, more critical for insight into programming. To benefit fully, you will need to work through it from beginning to end, reading the code, proving the lemmas, and doing the exercises. When finished, you will see how the application of the deductive method to your programs assures that your system's software components will work together and behave as they must.

The book presents a number of algorithms and requirements for types on which they are defined. The code for these descriptions—also available on the Web—is written in a small subset of C++ meant to be accessible to any experienced programmer. This subset is defined in a special language appendix coauthored by Sean Parent and Bjarne Stroustrup.

Whether you are a software developer, or any other professional for whom programming is an important activity, or a committed student, you will come to understand what the book's experienced authors have been

teaching and demonstrating for years—that mathematics is good for programming, and that theory is good for practice.

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In this age globalization it is important to someone to obtain information. The information will make you to definitely understand the condition of the world. The health of the world makes the information simpler to share. You can find a lot of recommendations to get information example: internet, newspapers, book, and soon. You will observe that now, a lot of publisher which print many kinds of book. The book that recommended to you is Elements of Programming this book consist a lot of the information from the condition of this world now. This kind of book was represented how do the world has grown up. The language styles that writer use to explain it is easy to understand. The actual writer made some exploration when he makes this book. This is why this book appropriate all of you.

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