Ralf Lämmel

Software Languages

Syntax, Semantics, and Metaprogramming

- **The first textbook on software language engineering, with a strong focus on application areas such as domain-specific languages, software composition, and software reverse engineering**
- **Covers a wide range of languages, from functional languages like Haskell to mainstream programming languages like Java and modeling languages like UML**
- **Complemented by a website providing additional teaching material such as lecture slides, software artifacts, and videos**

This book identifies, defines and illustrates the fundamental concepts and engineering techniques relevant to applications of software languages in software development. It presents software languages primarily from a software engineering perspective, i.e., it addresses how to parse, analyze, transform, generate, format, and otherwise process software artifacts in different software languages, as they appear in software development. To this end, it covers a wide range of software languages – most notably programming languages, domain-specific languages, modeling languages, exchange formats, and specifically also language definition languages. Further, different languages are leveraged to illustrate software language engineering concepts and techniques. The functional programming language Haskell dominates the book, while the mainstream programming languages Python and Java are additionally used for illustration. By doing this, the book collects and organizes scattered knowledge from software language engineering, focusing on application areas such as software analysis (software reverse engineering), software transformation (software re-engineering), software composition (modularity), and domain-specific languages. It is designed as a textbook for independent study as well as for bachelor's (advanced level) or master's university courses in Computer Science. An additional website provides complementary material, for example, lecture slides and videos.

1st ed. 2018, XXX, 424 p. 49 illus., 32 illus. in color.

Printed book

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Softcover
59,99 € | £54.99 | $74.99
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