

Ada for Software Engineers, Second Edition with Ada 2005 by Mordechai Ben-Ari

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Book Review by

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Save a place on your bookshelf next to John Barnes' book for this new edition of Ben-Ari's introduction to Ada 2005 for experienced programmers. Like the Barnes book, this one covers nearly all aspects of the Ada 2005 language. But this book also includes coverage of the container library, and the Annexes for Systems Programming, Real-Time Systems (including the Ravenscar Profile), Distributed Systems, and Information Systems. All aspects of Ada are illustrated with several large case studies rather than a large number of small examples. Yet Ben-Ari's book is 200 pages shorter. This reduction is accomplished through an approach he began with the first edition — make extensive use of the *Ada Reference Manual (ARM)*. His approach makes even more sense now with the availability of electronic versions of the *ARM*. The author provides the necessary guidance and a comprehensive glossary of *ARM* terminology with examples to allow mere mortals to read it. The book includes frequent quotes from the *ARM* and pointers to the paragraphs relevant to the topic at hand. Comparisons of Ada's features to C and Java may assist those engineers familiar with those languages make a transition to Ada.

The 22 chapters are divided into five parts. Chapters 1-5 cover the language constructs for programming in the small: types, statements, control structures, input/output, subprograms, and elementary data structures. Chapters 6-9 use a well thought out case study on discrete event simulation (of a rocket) to explain Ada's approach to object-oriented programming. This material includes discussion of packages and private types, type extension, inheritance, class-wide types, dynamic polymorphism, and generics. The rocket case study continues throughout the remainder of the book. Chapters 10-14 cover exceptions, the type system in detail (including access and numeric types) and more advanced input/output. Chapters 15-17 provide more material on program structure (including a nice discussion of elaboration), the container library, and interfaces. The final part, chapters 18-22, focuses on system topics: multitasking, low level programming, real-time, distributed, and high integrity systems.

Moti Ben-Ari is an internationally recognized educator. In 2004, the ACM Special Interest Group on Computer Science Education honored his accomplishments with the *ACM SIGCSE Award for Outstanding Contributions to Computer Science Education*. In 2009, he was elected an *ACM Distinguished Educator*. His talents in explaining difficult concepts are evident in this book. Few of us are proficient with all features of the Ada language. For those aspects for which I have a firm grasp, I found Ben-Ari's material to be accurate and complete. I learned a great deal about the topics for which I am less familiar from this book. The chapter on Ada 2005 containers is itself worth the price of admission. I was particularly impressed with the evolution of the rocket simulator case study throughout the book. It is not easy to grasp the significance of a programming language's object-oriented features when each is illustrated with a small independent example. The significant size of the case study provides a framework from which to appreciate Ada 2005's object-oriented features.

As a bottom-up learner, the number of forward references sometimes bothered me. However, it was almost always the case that the referenced material was not critical to understanding the point at hand. As an aid to understanding the priority of learning Ada's many features, Ben-Ari provides guidance by marking sections not necessary for a first reading of the chapter.

As an educator, I appreciate the projects and quiz questions at the end of each chapter. The source code for the example programs and quizzes as well as slides of all the figures are available on the publisher's web site, <http://www.springer.com/computer/book/978-1-84882-313-6>.