DESCRIPTION

Dai fondamenti agli oggetti (from basics to objects)
Java programming course

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The text is a real programming course designed for those who have no knowledge of the subject: the object-oriented paradigm is an ideal environment to approach programming from a perspective where objects constitute the bricks on which to build the program. The programmer has the task of co-ordinating them in order to obtain the desired behaviour. The text thus makes reference to this paradigm without, however, neglecting the traditional subjects related to programming with imperative languages.

For various reasons, including the relative simplicity of the text and its widespread usage, the authors have chosen to give – by using the Java language – a concrete form to the concepts presented. Furthermore, these concepts constitute an instrument that will undoubtedly be useful to the reader when tackling the subsequent study of other languages. In fact, the aim of the text is not to teach a programming language but rather to teach programming, through the use of a suitable language, i.e. Java, as an aid.

In general, the introduction to object-oriented programming takes place without too much insistence on the difference between the use of classes and their implementation. An approach which, according to the authors, mainly focuses on implementing details, thus causing the student to lose sight of the different levels of abstraction. Hence, the choice, which characterizes this text and makes it completely different from all others, to divide the contents into two basic parts: the first regarding use and the second, implementation of classes. By keeping these two aspects separate and by clarifying the different levels of abstraction, it is possible to emphasize the part oriented towards objects without neglecting the imperative parts.

During the first part of the course, the reader learns not only to identify the classes and objects that are useful in terms of solving specific problems but also to combine them, using material that is already available in libraries.

In this section, basic concepts linked not only to traditional programming but also to object-oriented programming (including the concepts of variables and data types, as well as the main control structures) are introduced. The most innovative and original aspect of the text, i.e. its abstraction level, is immediately evident: instead of limiting themselves to showing how to combine basic language instructions by means of control structures, the authors (right from the very first examples) focus on how to combine the services provided by the classes and objects.

Conversely, the second part of the course deals with the design and implementation of classes and objects. After mastering the ability to use classes that are already available, the reader then learns to implement his/her own ones. In this part, various subjects are developed in depth, including the concepts of over-loading and overriding and interfaces. Furthermore, an entire chapter is dedicated to the mechanism of exceptions.

KEY POINTS

- The book does not require any previous knowledge of programming or Java language.
- The text also contains a short introduction to the UML notation and various other in-depth analyses, including dynamic data structures, their implementation in Java, and the evolution of programming from machine languages to object-oriented languages.
- Numerous step-by-step examples and exercises which support the presentation of concepts and guide the student during the learning phase.

CONTENTS

SUPPLEMENTS

The CD-ROM enclosed contains the Java2 SDK Standard Edition of the Sun Microsystems environment, version 1.4.1 for Windows and Linux, the source code of the main examples and exercises, as well as some libraries to be used as back-up for the standard Java ones.
At the address http://homes.dico.unimi.it/~pighizzi/jb you can find the home page of the text, managed directly by the authors, who intend to collect supplementary material, additional exercises and library up-datings, developed after publication of the book.

Slides in pdf format are available to teachers using the text.

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