

Book Review: "The Student's Guide to VHDL".

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BOOK review:

The Student's Guide to VHDL
Author: Peter J. Ashenden
Morgan Kaufmann Publishers, 1998
ISBN 1-55860-520-7

The Student's Guide to VHDL teaches the fundamental modeling features of VHDL, showing how the features are used for the design of digital systems. It is organized so that it can be read linearly from front to back, as a structured self-learning guide to the language.

This very good book is suitable for use as a textbook for introductory VHDL classes, and it will also serve practicing engineers who need to acquire basic VHDL fluency, without going into the full (and complex) details of the language.

Features detailed through the book include the use of signals, entities and architectures for structural modeling; processes and programming data types and statements for behavioral modeling; and concurrent statements for functional modeling. The book also covers some advanced features, including resolved signal types, generics and configuration.

Each chapter introduces a number of related concepts or language facilities and includes exercises after each one.

Chapter 1: presents the basic concepts of a hardware description language and describes the reasons for its use and the benefits that ensue. It introduces the basic concepts underlying VHDL, serving as a basis for examples in the next chapters.

Chapters 2, 3 and 4: cover the aspects of VHDL that are more similar to conventional programming languages, and which may be used to describe the behavior of a system in algorithmic terms.

- Chapter 2 explains the basic type system of the language and introduces the scalar data types.
- Chapter 3 describes the sequential control structures.
- Chapter 4 covers composite data structures used to represent collections of data elements.

Chapter 5: shows the main facilities of VHDL used for basic modeling of the behavioral elements in a design, the signals used to interconnect them and the hierarchical structure of the design.

Chapters 6 and 7: extend this basic set of facilities with other language features available to make modeling of large systems more tractable.

- Chapter 6 introduces the use of procedures and functions, as a way to encapsulate behavioral aspects of a design.
- Chapter 7 introduces the concept of libraries and packages as a means of collecting together related parts of a design, and as a basic platform to reusability.

Chapters 8 to 10: cover some of the advanced modeling features in VHDL.

- Chapter 8 deals with resolved signals and resolution functions.
- Chapter 9 describes the use of generic constants to parameterize the behavior and structure of a design.
- Chapter 10 deals with the topics of component instantiation and configuration.

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