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LaTeX

and Friends

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M.R.C. van Dongen

LaTeX and Friends

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Foreword

NEARLY TWENTY YEARS after the first ideas for LaTeX2ε emerged, the use of LaTeX to produce high-quality technical documents shows no sign of waning. Indeed, over the past 5 or so years there has been if anything an *upturn* in interest in using LaTeX. Better editors, faster computers and the range of powerful LaTeX packages have all contributed to this increased uptake.

For the new user, this vibrancy can appear intimidating. The range of packages available for use with LaTeX is vast, and it is not always obvious which is the 'best of breed.' What new users need therefore is a guide not just to the basics of the LaTeX approach, but also help in navigating this ecosystem so that they can produce the documents they need as rapidly as possible.

Creating well-designed documents is about more than the technical detail of any typesetting system, and so as well as learning LaTeX it is also necessary to understand the wider ideas of good writing and good design if one is to create truly 'beautiful' material.

In *LaTeX and Friends*, Marc van Dongen provides an integrated solution to these inter-related requirements. Treating the presentation of beautiful documents as the key aim of the reader, it offers advice on good practice (both in LaTeX terms and beyond) in the relevant context for the beginner. It also avoids the problem seen in many texts, which fall short in supporting the transition from beginner to advanced user. Thus while new LaTeX users will find the information they need here, so will more established users, making this not only a beginners' guide but also a reference manual for day-to-day LaTeX users.

Joseph Wright

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Preface

THIS BOOK PROVIDES students with an introduction to technical writing and computer presentations with LaTeX, which is the de-facto standard in computer science and mathematics. The book may also be used as a reference for seasoned LaTeX users.

The book offers techniques for writing large and complex documents, preparing computer presentations, and creating complex graphics in an integrated manner. The book's website, which may be found at `http://csweb.ucc.ie/~dongen/LAF`, has three separate chapters explaining how to use a widely used LaTeX distribution on `Windows`, on `Unix`, and on the `Mac`. These chapters also provide an introduction to some selected integrated development environments (IDEs).

I have tried to minimise the number of classes and style files the reader has to know. This is one of the main reasons why I decided to use the `amsmath` package for the presentation of mathematics, and decided to use `tikz`, `pgfplots`, and `beamer` for the creation of diagrams, data plots, and computer presentations. Another advantage of this approach is that it simplifies the process of creating a viewable/printable output file because everything should work with `pdflatex`, which is a program that turns LaTeX into `pdf`.

The book avoids the use of what is known in the LaTeX community as "verbatim" commands and environments. except when it comes to including, well, verbatim program listings. The main reason for this decision is that verbatim commands in the hands of beginners often lead to errors that are difficult to find and are not always so easy to resolve. By no means should the decision to omit verbatim commands be a limitation; this book was written without verbatim commands, so why should you need them when you're writing a thesis or dissertation?

M.R.C. van Dongen
Cork
2011

Book Outline

THIS BOOK has seven parts, some of which are more technical than others. The following is a short outline.

The first two parts are called *Basics* and *Basic Typesetting*. These parts introduce the reader to the basic LaTeX commands for typesetting and cross-referencing. They also explain how to create one or several bibliographies and one or several indexes or glossaries.

The next part is *Tables, Diagrams, and Data Plots*, which is about presenting data in tables, diagrams with the `tikz` package, and data plots with the `pgfplots` package.

Mathematics and Algorithms is the next part. It explains how to typeset mathematics, how to typeset algorithms in pseudo-code, and how to present program listings.

This is followed by *Automation*, which explains how to implement user-defined commands, how to implement option parsing, and how to implement conditional branching. Some readers may wish to skip this part because it is more technical than the other parts.

Miscellany is the next part. It is a collection of optional chapters, some of which are of a more technical nature than others. The first, relatively easy, chapter explains how to create computer presentations with the `beamer` package. It continues with two more technical chapters that explain how to implement user-defined classes and packages and how to use OpenType fonts.

The last part is *References and Bibliography*, which is a collection of indexes, a list of acronyms, a bibliography, and a short typographic jargon reference. Readers not familiar with notions such as characters, glyphs, ligatures, serifs, kerning, fonts, typefaces, points, point size and leading, ems, and ens, are invited to start with the jargon reference before reading the rest of the book.

Overall, the chapters are well balanced but the chapters about typesetting mathematics and presenting diagrams with `tikz` are a bit longer and more detailed. This is why it was decided to split the presentation on typesetting mathematics into two separate chapters. The first of these chapters should be sufficient for most readers. The chapter about presenting diagrams with `tikz` was not split because it was felt that most readers who are interested in some of this chapter would also be interested in the rest.

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