Preface

Why We Wrote This Book

Our research group at the Hasso Plattner Institute (HPI) in Potsdam, Germany conducts research in the area of in-memory data management for enterprise applications since 2006. Since then, the ideas and concepts behind dictionary-encoded column-oriented in-memory databases have gained much traction, not only due to the success of SAP HANA as the cutting-edge industry product. As this topic reached a broader audience, we felt the need for proper education in this area. This is of utmost importance as students and software developers have to understand the underlying concepts and technology in order to make most use of it.

At our institute, we have been teaching in-memory data management to students in a Master’s course since 2009. When I learned about the current movement towards the direction of Massive Open Online Courses, I immediately decided that we should offer our course about in-memory data management to the public. On September 3, 2012 we launched our online lecture on the new e-learning platform http://www.openHPI.de. Since then, we granted more than 4,500 graded certificates to a total of over 28,000 participating learners. Please feel free to register at openHPI.de to be informed about upcoming lectures and take part in the next online course.

Several thousand people have already used our material in order to study for the homework assignments and final exam of this online course. This book is based on the reading material that we provided to the online community. In addition to that, we incorporated many suggestions for improvement as well as self-test questions and explanations. As a result, we provide you with a textbook teaching you the inner mechanics of a dictionary-encoded column-oriented in-memory database.
Navigating the Chapters

When giving a lecture, content is typically taught in a sequential manner. You have the advantage that you can read the book according to your interests. To help you navigating through the chapters, we provide a learning map showing how the different learning units build up on each other. For example, the learning unit “Differential Buffer” (Chap. 25) is found relatively late in the book. Nevertheless, you might already read it earlier. It requires that you understood the concepts of how “DELETEs”, “INSERTs”, and “UPDATEs” are conducted without a differential buffer.

The last section of each chapter contains self-test questions. You also find the questions together with the solutions and explanations at the end of this book.

Writing This Book Is Teamwork

I want to thank the team of my research group “Enterprise Platform and Integration Concepts” at the Hasso Plattner Institute at the University of Potsdam. This book would not exist without this team. Before, during, and after the online lectures, the whole research group took care that no email remained unanswered and feedback from the learning community was incorporated into the learning material.

Among the many contributors who deserve special mention for creating the initial release of this book and its newly revised second edition are Ralf Teusner,
Keven Richly, Anja Bog, Martin Boissier, Lars Butzmann, Ralf Diestelkämper, Cindy Fähnrich, Martin Faust, Martin Grund, Franziska Häger, Thomas Kowark, Jens Krüger, Martin Lorenz, Carsten Meyer, Jürgen Müller, Stephan Müller, Matthieu Schapranow, David Schwalb, Christian Schwarz, Christian Tinnefeld, Arian Treffer, Matthias Uflacker, Thomas Uhde, Johannes Wust as well as our team assistant Andrea Lange.

Last but not least, I also want to thank our thousands of online learners for their suggestions that resulted in steady improvements in the learning material. We continuously aim to further improve the learning material provided in this book and hope for your valuable feedback. If you identify any flaws, please do not hesitate to contact me at hasso.plattner@hpi.uni-potsdam.de.

We are thankful for any kind of feedback and hope that the learning material will be further improved by the in-memory database community.

Potsdam, Germany

Hasso Plattner