Principles Of Data Integration Download

David J. Hand,Heikki Mannila,Padhraic Smyth

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  Principles of Data Integration AnHai Doan,Alon Halevy,Zachary Ives,2012-06-25 Principles of Data Integration is the first comprehensive textbook of data integration, covering theoretical principles and implementation issues as well as current challenges raised by the semantic web and cloud computing. The book offers a range of data integration solutions enabling you to focus on what is most relevant to the problem at hand. Readers will also learn how to build their own algorithms and implement their own data integration application. Written by three of the most respected experts in the field, this book provides an extensive introduction to the theory and concepts underlying today's data integration techniques, with detailed, instruction for their application using concrete examples throughout to explain the concepts. This text is an ideal resource for database practitioners in industry, including data warehouse engineers, database system designers, data architects/enterprise architects, database researchers, statisticians, and data analysts; students in data analytics and knowledge discovery; and other data professionals working at the R&D and implementation levels. - Offers a range of data integration solutions enabling you to focus on what is most relevant to the problem at hand - Enables you to build your own algorithms and implement your own data integration applications
  Principles of Database Management Wilfried Lemahieu,Seppe vanden Broucke,Bart Baesens,2018-07-12 Introductory, theory-practice balanced text teaching the fundamentals of databases to advanced undergraduates or graduate students in information systems or computer science.
  Principles of Data Wrangling Tye Rattenbury,Joseph M. Hellerstein,Jeffrey Heer,Sean Kandel,Connor Carreras,2017-06-29 A key task that any aspiring data-driven organization needs to learn is data wrangling, the process of converting raw data into something truly useful. This practical guide provides business analysts with an overview of various data wrangling techniques and tools, and puts the practice of data wrangling into context by asking, What are you trying to do and why? Wrangling data consumes roughly 50-80% of an analyst's time before any kind of analysis is possible. Written by key executives at Trifacta, this book walks you through the wrangling process by exploring several factors—time, granularity, scope, and structure—that

you need to consider as you begin to work with data. You'll learn a shared language and a comprehensive understanding of data wrangling, with an emphasis on recent agile analytic processes used by many of today's data-driven organizations. Appreciate the importance—and the satisfaction—of wrangling data the right way. Understand what kind of data is available Choose which data to use and at what level of detail Meaningfully combine multiple sources of data Decide how to distill the results to a size and shape that can drive downstream analysis

Principles of Data Mining David J. Hand,Heikki Mannila,Padhraic Smyth,2001-08-17 The first truly interdisciplinary text on data mining, blending the contributions of information science, computer science, and statistics. The growing interest in data mining is motivated by a common problem across disciplines: how does one store, access, model, and ultimately describe and understand very large data sets? Historically, different aspects of data mining have been addressed independently by different disciplines. This is the first truly interdisciplinary text on data mining, blending the contributions of information science, computer science, and statistics. The book consists of three sections. The first, foundations, provides a tutorial overview of the principles underlying data mining algorithms and their application. The presentation emphasizes intuition rather than rigor. The second section, data mining algorithms, shows how algorithms are constructed to solve specific problems in a principled manner. The algorithms covered include trees and rules for classification and regression, association rules, belief networks, classical statistical models, nonlinear models such as neural networks, and local memory-based models. The third section shows how all of the preceding analysis fits together when applied to real-world data mining problems. Topics include the role of metadata, how to handle missing data, and data preprocessing.

Data and Information Quality Carlo Batini,Monica Scannapieco,2016-03-23 This book provides a systematic and comparative description of the vast number of research issues related to the quality of data and information. It does so by delivering a sound, integrated and comprehensive overview of the state of the art and future development of data and information quality in databases and information systems. To this end, it presents an extensive description of the techniques that constitute the core of data and information quality research, including record linkage (also called object identification), data integration, error localization and correction, and examines the related techniques in a comprehensive and original methodological framework. Quality dimension definitions and adopted models are also analyzed in detail, and differences between the proposed solutions are highlighted and discussed. Furthermore, while systematically describing data and information quality as an autonomous research area, paradigms and influences deriving from other areas, such as probability theory, statistical data analysis, data mining, knowledge representation, and machine learning are also included. Last not least, the book also highlights very practical solutions, such as methodologies, benchmarks for the most effective techniques, case studies, and examples. The book has been written primarily for researchers in the

fields of databases and information management or in natural sciences who are interested in investigating properties of data and information that have an impact on the quality of experiments, processes and on real life. The material presented is also sufficiently self-contained for masters or PhD-level courses, and it covers all the fundamentals and topics without the need for other textbooks. Data and information system administrators and practitioners, who deal with systems exposed to data-quality issues and as a result need a systematization of the field and practical methods in the area, will also benefit from the combination of concrete practical approaches with sound theoretical formalisms.

Logic-Based Artificial Intelligence Jack Minker,2000-12-31 The use of mathematical logic as a formalism for artificial intelligence was recognized by John McCarthy in 1959 in his paper on Programs with Common Sense. In a series of papers in the 1960's he expanded upon these ideas and continues to do so to this date. It is now 41 years since the idea of using a formal mechanism for AI arose. It is therefore appropriate to consider some of the research, applications and implementations that have resulted from this idea. In early 1995 John McCarthy suggested to me that we have a workshop on Logic-Based Artificial Intelligence (LBAI). In June 1999, the Workshop on Logic-Based Artificial Intelligence was held as a consequence of McCarthy's suggestion. The workshop came about with the support of Ephraim Glinert of the National Science Foundation (IIS-9S2013S), the American Association for Artificial Intelligence who provided support for graduate students to attend, and Joseph JaJa, Director of the University of Maryland Institute for Advanced Computer Studies who provided both manpower and financial support, and the Department of Computer Science. We are grateful for their support. This book consists of refereed papers based on presentations made at the Workshop. Not all of the Workshop participants were able to contribute papers for the book. The common theme of papers at the workshop and in this book is the use of logic as a formalism to solve problems in AI.

Data Mining and Data Warehousing Parteek Bhatia,2019-06-27 Written in lucid language, this valuable textbook brings together fundamental concepts of data mining and data warehousing in a single volume. Important topics including information theory, decision tree, Naïve Bayes classifier, distance metrics, partitioning clustering, associate mining, data marts and operational data store are discussed comprehensively. The textbook is written to cater to the needs of undergraduate students of computer science, engineering and information technology for a course on data mining and data warehousing. The text simplifies the understanding of the concepts through exercises and practical examples. Chapters such as classification, associate mining and cluster analysis are discussed in detail with their practical implementation using Weka and R language data mining tools. Advanced topics including big data analytics, relational data models and NoSQL are discussed in detail. Pedagogical features including unsolved problems and multiple-choice questions are interspersed throughout the book for better understanding.

Principles of Data Mining Max Bramer,2016-11-09 This book explains and explores the principal techniques of Data Mining, the automatic extraction of implicit and potentially useful information from data, which is increasingly used in commercial, scientific and other application areas. It focuses on classification, association rule mining and clustering. Each topic is clearly explained, with a focus on algorithms not mathematical formalism, and is illustrated by detailed worked examples. The book is written for readers without a strong background in mathematics or statistics and any formulae used are explained in detail. It can be used as a textbook to support courses at undergraduate or postgraduate levels in a wide range of subjects including Computer Science, Business Studies, Marketing, Artificial Intelligence, Bioinformatics and Forensic Science. As an aid to self study, this book aims to help general readers develop the necessary understanding of what is inside the 'black box' so they can use commercial data mining packages discriminatingly, as well as enabling advanced readers or academic researchers to understand or contribute to future technical advances in the field. Each chapter has practical exercises to enable readers to check their progress. A full glossary of technical terms used is included. This expanded third edition includes detailed descriptions of algorithms for classifying streaming data, both stationary data, where the underlying model is fixed, and data that is time-dependent, where the underlying model changes from time to time - a phenomenon known as concept drift.

SIAM: Principles and Practices for Service Integration and Management Dave Armes,Niklas Engelhart,Peter McKenzie,Peter Wiggers,2015-11-23 For trainers free additional material of this book is available. This can be found under the Training Material tab. Log in with your trainer account to access the material. The increasing complexity of the IT value chain and the rise of multi-vendor supplier ecosystems has led to the rise of Service Integration and Management (SIAM) as a new approach. Service Integration is the set of principles and practices, which facilitate the collaborative working relationships between service providers required to maximize the benefit of multi-sourcing. Service integration facilitates the linkage of services, the technology of which they are comprised and the delivery organizations and processes used to operate them, into a single operating model. SIAM is a relatively new and fast evolving concept. SIAM teams are being established in many organizations and in many different sectors, as part of a strategy for (out)sourcing IT services and other types of service. This is the first book that describes the concepts of SIAM. It is intended for: ITSM professionals working in integrated multi-sourced environments; Service customer managers, with a responsibility to secure the business supply of IT services in a multi-sourced environment; Service provider delivery managers with a responsibility to integrate multiple services to meet the demands of the customers business and users; Service provider managers with responsibilities to manage integrated services, participating in a multi-sourced environment.

Developing High Quality Data Models Matthew West,2011-02-07 Developing High Quality Data Models

provides an introduction to the key principles of data modeling. It explains the purpose of data models in both developing an Enterprise Architecture and in supporting Information Quality; common problems in data model development; and how to develop high quality data models, in particular conceptual, integration, and enterprise data models. The book is organized into four parts. Part 1 provides an overview of data models and data modeling including the basics of data model notation; types and uses of data models; and the place of data models in enterprise architecture. Part 2 introduces some general principles for data models, including principles for developing ontologically based data models; and applications of the principles for attributes, relationship types, and entity types. Part 3 presents an ontological framework for developing consistent data models. Part 4 provides the full data model that has been in development throughout the book. The model was created using Jotne EPM Technologys EDMVisualExpress data modeling tool. This book was designed for all types of modelers: from those who understand data modeling basics but are just starting to learn about data modeling in practice, through to experienced data modelers seeking to expand their knowledge and skills and solve some of the more challenging problems of data modeling. - Uses a number of common data model patterns to explain how to develop data models over a wide scope in a way that is consistent and of high quality - Offers generic data model templates that are reusable in many applications and are fundamental for developing more specific templates - Develops ideas for creating consistent approaches to high quality data models

Principles of Distributed Database Systems M. Tamer Özsu,Patrick Valduriez,2011-02-24 This third edition of a classic textbook can be used to teach at the senior undergraduate and graduate levels. The material concentrates on fundamental theories as well as techniques and algorithms. The advent of the Internet and the World Wide Web, and, more recently, the emergence of cloud computing and streaming data applications, has forced a renewal of interest in distributed and parallel data management, while, at the same time, requiring a rethinking of some of the traditional techniques. This book covers the breadth and depth of this re-emerging field. The coverage consists of two parts. The first part discusses the fundamental principles of distributed data management and includes distribution design, data integration, distributed query processing and optimization, distributed transaction management, and replication. The second part focuses on more advanced topics and includes discussion of parallel database systems, distributed object management, peer-to-peer data management, web data management, data stream systems, and cloud computing. New in this Edition: • New chapters, covering database replication, database integration, multidatabase query processing, peer-to-peer data management, and web data management. • Coverage of emerging topics such as data streams and cloud computing • Extensive revisions and updates based on years of class testing and feedback Ancillary teaching materials are available.

Designing Data-Intensive Applications Martin Kleppmann,2017-03-16 Data is at the center of many

challenges in system design today. Difficult issues need to be figured out, such as scalability, consistency, reliability, efficiency, and maintainability. In addition, we have an overwhelming variety of tools, including relational databases, NoSQL datastores, stream or batch processors, and message brokers. What are the right choices for your application? How do you make sense of all these buzzwords? In this practical and comprehensive guide, author Martin Kleppmann helps you navigate this diverse landscape by examining the pros and cons of various technologies for processing and storing data. Software keeps changing, but the fundamental principles remain the same. With this book, software engineers and architects will learn how to apply those ideas in practice, and how to make full use of data in modern applications. Peer under the hood of the systems you already use, and learn how to use and operate them more effectively Make informed decisions by identifying the strengths and weaknesses of different tools Navigate the trade-offs around consistency, scalability, fault tolerance, and complexity Understand the distributed systems research upon which modern databases are built Peek behind the scenes of major online services, and learn from their architectures

Data Integration in the Life Sciences Sören Auer,Maria-Esther Vidal,2018-12-29 This book constitutes revised selected papers from the 13th International Conference on Data Integration in the Life Sciences, DILS 2018, held in Hannover, Germany, in November 2018. The 5 full, 8 short, 3 poster and 4 demo papers presented in this volume were carefully reviewed and selected from 22 submissions. The papers are organized in topical sections named: big biomedical data integration and management; data exploration in the life sciences; biomedical data analytics; and big biomedical applications.

Data Mesh Zhamak Dehghani,2022-03-08 Many enterprises are investing in a next-generation data lake, hoping to democratize data at scale to provide business insights and ultimately make automated intelligent decisions. In this practical book, author Zhamak Dehghani reveals that, despite the time, money, and effort poured into them, data warehouses and data lakes fail when applied at the scale and speed of today's organizations. A distributed data mesh is a better choice. Dehghani guides architects, technical leaders, and decision makers on their journey from monolithic big data architecture to a sociotechnical paradigm that draws from modern distributed architecture. A data mesh considers domains as a first-class concern, applies platform thinking to create self-serve data infrastructure, treats data as a product, and introduces a federated and computational model of data governance. This book shows you why and how. Examine the current data landscape from the perspective of business and organizational needs, environmental challenges, and existing architectures Analyze the landscape's underlying characteristics and failure modes Get a complete introduction to data mesh principles and its constituents Learn how to design a data mesh architecture Move beyond a monolithic data lake to a distributed data mesh.

Principles of Data Quality Arthur D. Chapman,2005 *Seismic Attributes as the Framework for Data*

Integration Throughout the Oilfield Life Cycle Kurt J. Marfurt,2018-01-31 Useful attributes capture and quantify key components of the seismic amplitude and texture for subsequent integration with well log, microseismic, and production data through either interactive visualization or machine learning. Although both approaches can accelerate and facilitate the interpretation process, they can by no means replace the interpreter. Interpreter "grayware" includes the incorporation and validation of depositional, diagenetic, and tectonic deformation models, the integration of rock physics systematics, and the recognition of unanticipated opportunities and hazards. This book is written to accompany and complement the 2018 SEG Distinguished Instructor Short Course that provides a rapid overview of how 3D seismic attributes provide a framework for data integration over the life of the oil and gas field. Key concepts are illustrated by example, showing modern workflows based on interactive interpretation and display as well as those aided by machine learning.

Principles of Big Data Jules J. Berman,2013-05-20 Principles of Big Data helps readers avoid the common mistakes that endanger all Big Data projects. By stressing simple, fundamental concepts, this book teaches readers how to organize large volumes of complex data, and how to achieve data permanence when the content of the data is constantly changing. General methods for data verification and validation, as specifically applied to Big Data resources, are stressed throughout the book. The book demonstrates how adept analysts can find relationships among data objects held in disparate Big Data resources, when the data objects are endowed with semantic support (i.e., organized in classes of uniquely identified data objects). Readers will learn how their data can be integrated with data from other resources, and how the data extracted from Big Data resources can be used for purposes beyond those imagined by the data creators. - Learn general methods for specifying Big Data in a way that is understandable to humans and to computers - Avoid the pitfalls in Big Data design and analysis - Understand how to create and use Big Data safely and responsibly with a set of laws, regulations and ethical standards that apply to the acquisition, distribution and integration of Big Data resources

Cloud Computing Rajkumar Buyya,James Broberg,Andrzej M. Goscinski,2010-12-17 The primary purpose of this book is to capture the state-of-the-art in Cloud Computing technologies and applications. The book will also aim to identify potential research directions and technologies that will facilitate creation a global market-place of cloud computing services supporting scientific, industrial, business, and consumer applications. We expect the book to serve as a reference for larger audience such as systems architects, practitioners, developers, new researchers and graduate level students. This area of research is relatively recent, and as such has no existing reference book that addresses it. This book will be a timely contribution to a field that is gaining considerable research interest, momentum, and is expected to be of increasing interest to commercial developers. The book is targeted for professional computer science developers and graduate students especially at Masters level. As Cloud Computing is

recognized as one of the top five emerging technologies that will have a major impact on the quality of science and society over the next 20 years, its knowledge will help position our readers at the forefront of the field.

Information Governance Principles and Practices for a Big Data Landscape Chuck Ballard,Cindy Compert,Tom Jesionowski,Ivan Milman,Bill Plants,Barry Rosen,Harald Smith,IBM Redbooks,2014-03-31 This IBM® Redbooks® publication describes how the IBM Big Data Platform provides the integrated capabilities that are required for the adoption of Information Governance in the big data landscape. As organizations embark on new use cases, such as Big Data Exploration, an enhanced 360 view of customers, or Data Warehouse modernization, and absorb ever growing volumes and variety of data with accelerating velocity, the principles and practices of Information Governance become ever more critical to ensure trust in data and help organizations overcome the inherent risks and achieve the wanted value. The introduction of big data changes the information landscape. Data arrives faster than humans can react to it, and issues can quickly escalate into significant events. The variety of data now poses new privacy and security risks. The high volume of information in all places makes it harder to find where these issues, risks, and even useful information to drive new value and revenue are. Information Governance provides an organization with a framework that can align their wanted outcomes with their strategic management principles, the people who can implement those principles, and the architecture and platform that are needed to support the big data use cases.

The IBM Big Data Platform, coupled with a framework for Information Governance, provides an approach to build, manage, and gain significant value from the big data landscape.

Data Integration Blueprint and Modeling Anthony David Giordano,2010-12-27 Making Data Integration Work: How to Systematically Reduce Cost, Improve Quality, and Enhance Effectiveness Today's enterprises are investing massive resources in data integration. Many possess thousands of point-to-point data integration applications that are costly, undocumented, and difficult to maintain. Data integration now accounts for a major part of the expense and risk of typical data warehousing and business intelligence projects-- and, as businesses increasingly rely on analytics, the need for a blueprint for data integration is increasing now more than ever. This book presents the solution: a clear, consistent approach to defining, designing, and building data integration components to reduce cost, simplify management, enhance quality, and improve effectiveness. Leading IBM data management expert Tony Giordano brings together best practices for architecture, design, and methodology, and shows how to do the disciplined work of getting data integration right. Mr. Giordano begins with an overview of the "patterns" of data integration, showing how to build blueprints that smoothly handle both operational and analytic data integration. Next, he walks through the entire project lifecycle, explaining each phase, activity, task, and deliverable through a complete case study. Finally, he shows how to integrate data integration with other information management disciplines, from data governance to metadata.

The book's appendices bring together key principles, detailed models, and a complete data integration glossary. Coverage includes Implementing repeatable, efficient, and well-documented processes for integrating data Lowering costs and improving quality by eliminating unnecessary or duplicative data integrations Managing the high levels of complexity associated with integrating business and technical data Using intuitive graphical design techniques for more effective process and data integration modeling Building end-to-end data integration applications that bring together many complex data sources

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