

Managing Gigabytes Compressing And Indexing Documents And Images Second Edition The Morgan Kaufmann Series In Multimedia Information And Systems

The quick way to learn Windows 10 This is learning made easy. Get more done quickly with Windows 10. Jump in wherever you need answers--brisk lessons and colorful screenshots show you exactly what to do, step by step. Discover fun and functional Windows 10 features! Work with the new, improved Start menu and Start screen Learn about different sign-in methods Put the Cortana personal assistant to work for you Manage your online reading list and annotate articles with the new browser, Microsoft Edge Help safeguard your computer, your information, and your privacy Manage connections to networks, devices, and storage resources

This book constitutes the refereed proceedings of the 38th European Conference on IR Research, ECIR 2016, held in Padua, Italy, in March 2016. The 42 full papers and 28 poster papers presented together with 3 keynote talks and 6 demonstration papers, were carefully reviewed and selected from 284 submissions. The volume contains the outcome of 4 workshops as well as 4 tutorial papers in addition. Being the premier European forum for the presentation of new research results in the field of Information Retrieval, ECIR features a wide range of topics such as: social context and news, machine learning, question answering,

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ranking, evaluation methodology, probabilistic modeling, evaluation issues, multimedia and collaborative filtering, and many more.

Held in Gaithersburg, MD, Nov. 4-6, 1992. Evaluates new technologies in information retrieval. Numerous graphs, tables and charts.

Web Dragons offers a perspective on the world of Web search and the effects of search engines and information availability on the present and future world. In the blink of an eye since the turn of the millennium, the lives of people who work with information have been utterly transformed. Everything we need to know is on the web. It's where we learn and play, shop and do business, keep up with old friends and meet new ones. Search engines make it possible for us to find the stuff we need to know. Search engines — web dragons — are the portals through which we access society's treasure trove of information. How do they stack up against librarians, the gatekeepers over centuries past? What role will libraries play in a world whose information is ruled by the web? How is the web organized? Who controls its contents, and how do they do it? How do search engines work? How can web visibility be exploited by those who want to sell us their wares? What's coming tomorrow, and can we influence it? As we witness the dawn of a new era, this book shows readers what it will look like and how it will change their world. Whoever you are: if you care about information, this book will open your eyes and make you blink. Presents a critical view of the idea of funneling information access through a small handful of gateways and the notion of a centralized index--and the problems that may cause Provides promising approaches for addressing the problems, such as the personalization of web services Presented by authorities in the field of digital libraries, web history, machine learning, and web and data mining Find more information at the author's site:

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webdragons.net

Our world is being revolutionized by data-driven methods: access to large amounts of data has generated new insights and opened exciting new opportunities in commerce, science, and computing applications. Processing the enormous quantities of data necessary for these advances requires large clusters, making distributed computing paradigms more crucial than ever. MapReduce is a programming model for expressing distributed computations on massive datasets and an execution framework for large-scale data processing on clusters of commodity servers. The programming model provides an easy-to-understand abstraction for designing scalable algorithms, while the execution framework transparently handles many system-level details, ranging from scheduling to synchronization to fault tolerance. This book focuses on MapReduce algorithm design, with an emphasis on text processing algorithms common in natural language processing, information retrieval, and machine learning. We introduce the notion of MapReduce design patterns, which represent general reusable solutions to commonly occurring problems across a variety of problem domains. This book not only intends to help the reader "think in MapReduce", but also discusses limitations of the programming model as well. This volume is a printed version of a work that appears in the Synthesis Digital Library of Engineering and Computer Science. Synthesis Lectures provide concise, original presentations of important research and development topics, published quickly, in digital and print formats. For more information visit www.morganclaypool.com

Invented about 40 years ago and called ubiquitous less than 10 years later, B-tree indexes have been used in a wide variety of computing systems from handheld devices to mainframes and server farms. Over the years, many techniques have been added to the basic design in

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order to improve efficiency or to add functionality. Examples include separation of updates to structure or contents, utility operations such as non-logged yet transactional index creation, and robust query processing such as graceful degradation during index-to-index navigation. Modern B-Tree Techniques reviews the basics of B-trees and of B-tree indexes in databases, transactional techniques and query processing techniques related to B-trees, B-tree utilities essential for database operations, and many optimizations and improvements. It is intended both as a tutorial and as a reference, enabling researchers to compare index innovations with advanced B-tree techniques and enabling professionals to select features, functions, and tradeoffs most appropriate for their data management challenges.

This volume of the Lecture Notes in Computer Science series provides a comprehensive, state-of-the-art survey of recent advances in string processing and information retrieval. It includes invited and research papers presented at the 9th International Symposium on String Processing and Information Retrieval, SPIRE2002, held in Lisbon, Portugal. SPIRE has its origins in the South American Workshop on String Processing which was first held in Belo Horizonte, Brazil, in 1993. Starting in 1998, the focus of the workshop was broadened to include the area of information retrieval due to its increasing relevance and its inter-relationship with the area of string processing. The call for papers for SPIRE2002 resulted in the submission of 54 papers from researchers around the world. Of these, 19 were selected for inclusion in the program (an acceptance rate of 35%). In addition, the Program Committee decided to accept six other papers, considered as describing interesting ongoing research, in the form of short papers. The authors of these 25 papers came from 18 different countries (Argentina, Australia, Brazil, Canada, Czech Republic, Chile, Colombia, Finland, France,

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Germany, Japan, Italy, Mexico, Saudi Arabia, Switzerland, Spain, United Kingdom, and USA). Data Mining: Practical Machine Learning Tools and Techniques, Third Edition, offers a thorough grounding in machine learning concepts as well as practical advice on applying machine learning tools and techniques in real-world data mining situations. This highly anticipated third edition of the most acclaimed work on data mining and machine learning will teach you everything you need to know about preparing inputs, interpreting outputs, evaluating results, and the algorithmic methods at the heart of successful data mining. Thorough updates reflect the technical changes and modernizations that have taken place in the field since the last edition, including new material on Data Transformations, Ensemble Learning, Massive Data Sets, Multi-instance Learning, plus a new version of the popular Weka machine learning software developed by the authors. Witten, Frank, and Hall include both tried-and-true techniques of today as well as methods at the leading edge of contemporary research. The book is targeted at information systems practitioners, programmers, consultants, developers, information technology managers, specification writers, data analysts, data modelers, database R&D professionals, data warehouse engineers, data mining professionals. The book will also be useful for professors and students of upper-level undergraduate and graduate-level data mining and machine learning courses who want to incorporate data mining as part of their data management knowledge base and expertise. Provides a thorough grounding in machine learning concepts as well as practical advice on applying the tools and techniques to your data mining projects Offers concrete tips and techniques for performance improvement that work by transforming the input or output in machine learning methods Includes downloadable Weka software toolkit, a collection of machine learning algorithms for data mining tasks—in an

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updated, interactive interface. Algorithms in toolkit cover: data pre-processing, classification, regression, clustering, association rules, visualization

The Internet and World Wide Web have revolutionized access to information. Users now store information across multiple platforms from personal computers to smartphones and websites. As a consequence, data management concepts, methods and techniques are increasingly focused on distribution concerns. Now that information largely resides in the network, so do the tools that process this information. This book explains the foundations of XML with a focus on data distribution. It covers the many facets of distributed data management on the Web, such as description logics, that are already emerging in today's data integration applications and herald tomorrow's semantic Web. It also introduces the machinery used to manipulate the unprecedented amount of data collected on the Web. Several 'Putting into Practice' chapters describe detailed practical applications of the technologies and techniques. The book will serve as an introduction to the new, global, information systems for Web professionals and master's level courses.

This book constitutes the proceedings of the 36th European Conference on IR Research, ECIR 2014, held in Amsterdam, The Netherlands, in April 2014. The 33 full papers, 50 poster papers and 15 demonstrations presented in this volume were carefully reviewed and selected from 288 submissions. The papers are organized in the following topical sections: evaluation, recommendation, optimization, semantics, aggregation, queries, mining social media, digital libraries, efficiency, and information retrieval theory. Also included are 3 tutorial and 4 workshop presentations.

This successful book, first published in 1980 and now in its fourth edition, provides an

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authoritative guide for busy practitioners trying to keep pace with current trends in small animal orthopaedic surgery. In this new edition Hamish Denny and Steven Butterworth have retained the same practical approach but have completely rewritten and updated the book to provide a comprehensive review of orthopaedic and spinal conditions in the dog and cat. The illustrations have also undergone a major overhaul and the many line drawings are now combined with photographs and radiographs to clarify diagnostic and surgical techniques. Although the size of the book has increased, its regional approach to problems still enables the reader to use it as a rapid reference guide. It will prove an invaluable source of information for veterinary practitioners diagnosing and treating orthopaedic and spinal problems, while postgraduate students taking further qualifications in orthopaedics will find a sound basis for their studies and further reading provided here.

This book constitutes the refereed proceedings of the joint 6th International Semantic Web Conference, ISWC 2007, and the 2nd Asian Semantic Web Conference, ASWC 2007, held in Busan, Korea, in November 2007. The 50 revised full academic papers and 12 revised application papers presented together with 5 Semantic Web Challenge papers and 12 selected doctoral consortium articles were carefully reviewed and selected from a total of 257 submitted papers to the academic track and 29 to the applications track. The papers address all current issues in the field of the semantic Web, ranging from theoretical and foundational aspects to various applied topics such as management of semantic Web data, ontologies, semantic Web architecture, social semantic Web, as well as applications of the semantic Web. Short descriptions of the top five winning applications submitted to the Semantic Web Challenge competition conclude the volume.

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Now in its second edition, this book focuses on practical algorithms for mining data from even the largest datasets.

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Class-tested and coherent, this textbook teaches classical and web information retrieval, including web search and the related areas of text classification and text clustering from basic concepts. It gives an up-to-date treatment of all aspects of the design and implementation of systems for gathering, indexing, and searching documents; methods for evaluating systems; and an introduction to the use of machine learning methods on text collections. All the important ideas are explained using examples and figures, making it perfect for introductory courses in information retrieval for advanced undergraduates and graduate students in computer science. Based on feedback from extensive classroom experience, the book has been carefully structured in order to make teaching more natural and effective. Slides and additional exercises (with solutions for lecturers) are also available through the book's supporting website to help course instructors prepare their lectures.

Algorithms and Data Structures for External Memory describes several useful paradigms for the design and implementation of efficient external memory (EM) algorithms and data structures. The problem domains considered include sorting, permuting, FFT, scientific computing, computational geometry, graphs, databases, geographic information systems, and text and string processing.

In very short time, peer-to-peer computing has evolved from an attractive new paradigm into an exciting and vibrant research field bringing together researchers from systems, networking, and theory. This book constitutes the thoroughly refereed post-proceedings of the Second

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International Workshop on Peer-to-Peer Systems, IPTPS 2003, held in Berkeley, CA, USA in February 2003. The 27 revised papers presented together with an introductory summary of the discussions at the workshop were carefully selected during two rounds of reviewing and revision from initially 166 submissions. The papers are organized in topical sections on experience with P2P; theory and algorithms, P2P in a broader perspective; incentive and fairness; new DHT designs; naming, indexing, and searching; file sharing; and networking and applications.

How to Build a Digital Library reviews knowledge and tools to construct and maintain a digital library, regardless of the size or purpose. A resource for individuals, agencies, and institutions wishing to put this powerful tool to work in their burgeoning information treasuries. The Second Edition reflects developments in the field as well as in the Greenstone Digital Library open source software. In Part I, the authors have added an entire new chapter on user groups, user support, collaborative browsing, user contributions, and so on. There is also new material on content-based queries, map-based queries, cross-media queries. There is an increased emphasis placed on multimedia by adding a "digitizing" section to each major media type. A new chapter has also been added on "internationalization," which will address Unicode standards, multi-language interfaces and collections, and issues with non-European languages (Chinese, Hindi, etc.). Part II, the software tools section, has been completely rewritten to reflect the new developments in Greenstone Digital Library Software, an internationally popular open source software tool with a comprehensive graphical facility for creating and maintaining digital libraries. Outlines the history of libraries on both traditional and digital Written for both technical and non-technical audiences and covers the entire spectrum of media, including text,

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images, audio, video, and related XML standards Web-enhanced with software documentation, color illustrations, full-text index, source code, and more

"This book is the Bible for anyone who needs to manage large data collections. It's required reading for our search gurus at Infoseek. The authors have done an outstanding job of incorporating and describing the most significant new research in information retrieval over the past five years into this second edition." Steve Kirsch, Cofounder, Infoseek Corporation "The new edition of Witten, Moffat, and Bell not only has newer and better text search algorithms but much material on image analysis and joint image/text processing. If you care about search engines, you need this book: it is the only one with full details of how they work. The book is both detailed and enjoyable; the authors have combined elegant writing with top-grade programming." Michael Lesk, National Science Foundation "The coverage of compression, file organizations, and indexing techniques for full text and document management systems is unsurpassed. Students, researchers, and practitioners will all benefit from reading this book." Bruce Croft, Director, Center for Intelligent Information Retrieval at the University of Massachusetts In this fully updated second edition of the highly acclaimed Managing Gigabytes, authors Witten, Moffat, and Bell continue to provide unparalleled coverage of state-of-the-art techniques for compressing and indexing data. Whatever your field, if you work with large quantities of information, this book is essential reading--an authoritative theoretical resource and a practical guide to meeting the toughest storage and access challenges. It covers the latest developments in compression and indexing and their application on the Web and in digital libraries. It also details dozens of powerful techniques supported by mg, the authors' own system for compressing, storing, and retrieving text, images, and textual images.

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mg's source code is freely available on the Web.

Digital audio, video, images, and documents are flying through cyberspace to their respective owners. Unfortunately, along the way, individuals may choose to intervene and take this content for themselves. Digital watermarking and steganography technology greatly reduces the instances of this by limiting or eliminating the ability of third parties to decipher the content that he has taken. The many techniques of digital watermarking (embedding a code) and steganography (hiding information) continue to evolve as applications that necessitate them do the same. The authors of this second edition provide an update on the framework for applying these techniques that they provided researchers and professionals in the first well-received edition. Steganography and steganalysis (the art of detecting hidden information) have been added to a robust treatment of digital watermarking, as many in each field research and deal with the other. New material includes watermarking with side information, QIM, and dirty-paper codes. The revision and inclusion of new material by these influential authors has created a must-own book for anyone in this profession. This new edition now contains essential information on steganalysis and steganography New concepts and new applications including QIM introduced Digital watermark embedding is given a complete update with new processes and applications

Each edition of Introduction to Data Compression has widely been considered the best introduction and reference text on the art and science of data compression, and the third edition continues in this tradition. Data compression techniques and technology are ever-evolving with new applications in image, speech, text, audio, and video. The third edition includes all the cutting edge updates the reader will need during the work day and in class.

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Khalid Sayood provides an extensive introduction to the theory underlying today's compression techniques with detailed instruction for their applications using several examples to explain the concepts. Encompassing the entire field of data compression Introduction to Data Compression, includes lossless and lossy compression, Huffman coding, arithmetic coding, dictionary techniques, context based compression, scalar and vector quantization. Khalid Sayood provides a working knowledge of data compression, giving the reader the tools to develop a complete and concise compression package upon completion of his book. *New content added on the topic of audio compression including a description of the mp3 algorithm *New video coding standard and new facsimile standard explained *Completely explains established and emerging standards in depth including JPEG 2000, JPEG-LS, MPEG-2, Group 3 and 4 faxes, JBIG 2, ADPCM, LPC, CELP, and MELP *Source code provided via companion web site that gives readers the opportunity to build their own algorithms, choose and implement techniques in their own applications

Covers topics including HTTP methods and status codes, optimizing proxies, designing web crawlers, content negotiation, and load-balancing strategies.

This is the eBook of the printed book and may not include any media, website access codes, or print supplements that may come packaged with the bound book. Search Engines: Information Retrieval in Practice is ideal for introductory information retrieval courses at the undergraduate and graduate level in computer science, information science and computer engineering departments. It is also a valuable tool for search engine and information retrieval professionals. Written by a leader in the field of information retrieval, Search Engines: Information Retrieval in Practice , is designed to give undergraduate students the

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understanding and tools they need to evaluate, compare and modify search engines.

Coverage of the underlying IR and mathematical models reinforce key concepts. The book's numerous programming exercises make extensive use of Galago, a Java-based open source search engine.

Compression and Coding Algorithms describes in detail the coding mechanisms that are available for use in data compression systems. The well known Huffman coding technique is one mechanism, but there have been many others developed over the past few decades, and this book describes, explains and assesses them. People undertaking research of software development in the areas of compression and coding algorithms will find this book an indispensable reference. In particular, the careful and detailed description of algorithms and their implementation, plus accompanying pseudo-code that can be readily implemented on computer, make this book a definitive reference in an area currently without one.

The second edition of Understanding Search Engines: Mathematical Modeling and Text Retrieval follows the basic premise of the first edition by discussing many of the key design issues for building search engines and emphasizing the important role that applied mathematics can play in improving information retrieval. The authors discuss important data structures, algorithms, and software as well as user-centered issues such as interfaces, manual indexing, and document preparation. Readers will find that the second edition includes significant changes that bring the text up to date on current information retrieval

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methods. For example, the authors have added a completely new chapter on link-structure algorithms used in search engines such as Google, and the chapter on user interface has been rewritten to specifically focus on search engine usability. To reflect updates in the literature on information retrieval, the authors have added new recommendations for further reading and expanded the bibliography. In addition, the index has been updated and streamlined to make it more reader friendly.

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This book offers a thorough grounding in machine learning concepts combined with practical advice on applying machine learning tools and techniques in real-world data mining situations. Clearly written and effectively illustrated, this book is ideal for anyone involved at any level in the work of extracting usable knowledge from large collections of data. Complementing the book's instruction is fully functional machine learning software.

Work with petabyte-scale datasets while building a collaborative, agile workplace in the process. This practical book is the canonical reference to Google BigQuery, the query engine that lets you conduct interactive analysis of large datasets. BigQuery enables enterprises to efficiently store, query, ingest, and

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learn from their data in a convenient framework. With this book, you'll examine how to analyze data at scale to derive insights from large datasets efficiently. Valliappa Lakshmanan, tech lead for Google Cloud Platform, and Jordan Tigani, engineering director for the BigQuery team, provide best practices for modern data warehousing within an autoscaled, serverless public cloud. Whether you want to explore parts of BigQuery you're not familiar with or prefer to focus on specific tasks, this reference is indispensable.

Extremely slow communication is a daily reality for many people with different forms of physical disability. Modern computer interfaces can be designed to enhance expressive communication. This is accomplished first by supplying facilities to tailor them to each particular user's residual physical disabilities, and second by automatically supplying much of the redundancy inherent in natural communication. In the first part of this book a functional architecture for communication aids is discussed and the idea of automatically supplying the intrinsic redundancy contained in natural communication is explained. The distinctions between adaptive and non-adaptive models of communication are shown and details are given of working predictive text generation systems. One such system is the Reactive Keyboard, and in the second part of the book this is described. It greatly speeds communication by predicting the user's next

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response before it is made, although it does not always predict correctly. The guesses are made on the basis of previous answers and thus can conform to whatever kind of text is entered. Versions of the Reactive Keyboard exist for Unix, IBM PC, and Macintosh systems, free of charge, and can be tailored to individual user needs. This book will be of great value to all involved in helping disabled users interact with computers.

“We finally have the definitive treatise on PyTorch! It covers the basics and abstractions in great detail. I hope this book becomes your extended reference document.” —Soumith Chintala, co-creator of PyTorch

Key Features Written by PyTorch’s creator and key contributors

- Develop deep learning models in a familiar Pythonic way
- Use PyTorch to build an image classifier for cancer detection
- Diagnose problems with your neural network and improve training with data augmentation

Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications.

About The Book Every other day we hear about new ways to put deep learning to good use: improved medical imaging, accurate credit card fraud detection, long range weather forecasting, and more. PyTorch puts these superpowers in your hands. Instantly familiar to anyone who knows Python data tools like NumPy and Scikit-learn, PyTorch simplifies deep learning without sacrificing advanced features. It’s great

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for building quick models, and it scales smoothly from laptop to enterprise. Deep Learning with PyTorch teaches you to create deep learning and neural network systems with PyTorch. This practical book gets you to work right away building a tumor image classifier from scratch. After covering the basics, you'll learn best practices for the entire deep learning pipeline, tackling advanced projects as your PyTorch skills become more sophisticated. All code samples are easy to explore in downloadable Jupyter notebooks. What You Will Learn Understanding deep learning data structures such as tensors and neural networks Best practices for the PyTorch Tensor API, loading data in Python, and visualizing results Implementing modules and loss functions Utilizing pretrained models from PyTorch Hub Methods for training networks with limited inputs Sifting through unreliable results to diagnose and fix problems in your neural network Improve your results with augmented data, better model architecture, and fine tuning This Book Is Written For For Python programmers with an interest in machine learning. No experience with PyTorch or other deep learning frameworks is required. About The Authors Eli Stevens has worked in Silicon Valley for the past 15 years as a software engineer, and the past 7 years as Chief Technical Officer of a startup making medical device software. Luca Antiga is co-founder and CEO of an AI engineering company located in Bergamo, Italy, and a regular contributor

to PyTorch. Thomas Viehmann is a Machine Learning and PyTorch speciality trainer and consultant based in Munich, Germany and a PyTorch core developer.

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The Burrows-Wheeler Transform is one of the best lossless compression methods available. It is an intriguing — even puzzling — approach to squeezing redundancy out of data, it has an interesting history, and it has applications well beyond its original purpose as a compression method. It is a relatively late addition to the compression canon, and hence our motivation to write this book, looking at the method in detail, bringing together the threads that led to its

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discovery and development, and speculating on what future ideas might grow out of it. The book is aimed at a wide audience, ranging from those interested in learning a little more than the short descriptions of the BWT given in standard texts, through to those whose research is building on what we know about compression and pattern matching. The first few chapters are a careful description suitable for readers with an elementary computer science background (and these chapters have been used in undergraduate courses), but later chapters collect a wide range of detailed developments, some of which are built on advanced concepts from a range of computer science topics (for example, some of the advanced material has been used in a graduate computer science course in string algorithms). Some of the later explanations require some mathematical sophistication, but most should be accessible to those with a broad background in computer science.

Gain hands-on experience with HDF5 for storing scientific data in Python. This practical guide quickly gets you up to speed on the details, best practices, and pitfalls of using HDF5 to archive and share numerical datasets ranging in size from gigabytes to terabytes. Through real-world examples and practical exercises, you'll explore topics such as scientific datasets, hierarchically organized groups, user-defined metadata, and interoperable files. Examples are

applicable for users of both Python 2 and Python 3. If you're familiar with the basics of Python data analysis, this is an ideal introduction to HDF5. Get set up with HDF5 tools and create your first HDF5 file Work with datasets by learning the HDF5 Dataset object Understand advanced features like dataset chunking and compression Learn how to work with HDF5's hierarchical structure, using groups Create self-describing files by adding metadata with HDF5 attributes Take advantage of HDF5's type system to create interoperable files Express relationships among data with references, named types, and dimension scales Discover how Python mechanisms for writing parallel code interact with HDF5 Chapter 1 places into perspective a total Information Storage and Retrieval System. This perspective introduces new challenges to the problems that need to be theoretically addressed and commercially implemented. Ten years ago commercial implementation of the algorithms being developed was not realistic, allowing theoreticians to limit their focus to very specific areas. Bounding a problem is still essential in deriving theoretical results. But the commercialization and insertion of this technology into systems like the Internet that are widely being used changes the way problems are bounded. From a theoretical perspective, efficient scalability of algorithms to systems with gigabytes and terabytes of data, operating with minimal user search statement information, and

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making maximum use of all functional aspects of an information system need to be considered. The dissemination systems using persistent indexes or mail files to modify ranking algorithms and combining the search of structured information fields and free text into a consolidated weighted output are examples of potential new areas of investigation. The best way for the theoretician or the commercial developer to understand the importance of problems to be solved is to place them in the context of a total vision of a complete system. Understanding the differences between Digital Libraries and Information Retrieval Systems will add an additional dimension to the potential future development of systems. The collaborative aspects of digital libraries can be viewed as a new source of information that dynamically could interact with information retrieval techniques. This book constitutes the refereed proceedings of the 11th International Conference on String Processing and Information Retrieval, SPIRE 2004, held in Padova, Italy, in October 2004. The 28 revised full papers and 16 revised short papers presented were carefully reviewed and selected from 123 submissions. The papers address current issues in string pattern searching and matching, string discovery, data compression, data mining, text mining, machine learning, information retrieval, digital libraries, and applications in various fields, such as bioinformatics, speech and natural language processing, Web links and

communities, and multilingual data.

The definitive book on mining the Web from the preeminent authority.

An introduction to information retrieval, the foundation for modern search engines, that emphasizes implementation and experimentation. Information retrieval is the foundation for modern search engines. This textbook offers an introduction to the core topics underlying modern search technologies, including algorithms, data structures, indexing, retrieval, and evaluation. The emphasis is on implementation and experimentation; each chapter includes exercises and suggestions for student projects. Wumpus—a multiuser open-source information retrieval system developed by one of the authors and available online—provides model implementations and a basis for student work. The modular structure of the book allows instructors to use it in a variety of graduate-level courses, including courses taught from a database systems perspective, traditional information retrieval courses with a focus on IR theory, and courses covering the basics of Web retrieval. In addition to its classroom use, Information Retrieval will be a valuable reference for professionals in computer science, computer engineering, and software engineering.

This book has two main goals: to define data science through the work of data scientists and their results, namely data products, while simultaneously providing

the reader with relevant lessons learned from applied data science projects at the intersection of academia and industry. As such, it is not a replacement for a classical textbook (i.e., it does not elaborate on fundamentals of methods and principles described elsewhere), but systematically highlights the connection between theory, on the one hand, and its application in specific use cases, on the other. With these goals in mind, the book is divided into three parts: Part I pays tribute to the interdisciplinary nature of data science and provides a common understanding of data science terminology for readers with different backgrounds. These six chapters are geared towards drawing a consistent picture of data science and were predominantly written by the editors themselves. Part II then broadens the spectrum by presenting views and insights from diverse authors – some from academia and some from industry, ranging from financial to health and from manufacturing to e-commerce. Each of these chapters describes a fundamental principle, method or tool in data science by analyzing specific use cases and drawing concrete conclusions from them. The case studies presented, and the methods and tools applied, represent the nuts and bolts of data science. Finally, Part III was again written from the perspective of the editors and summarizes the lessons learned that have been distilled from the case studies in Part II. The section can be viewed as a meta-study on data

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science across a broad range of domains, viewpoints and fields. Moreover, it provides answers to the question of what the mission-critical factors for success in different data science undertakings are. The book targets professionals as well as students of data science: first, practicing data scientists in industry and academia who want to broaden their scope and expand their knowledge by drawing on the authors' combined experience. Second, decision makers in businesses who face the challenge of creating or implementing a data-driven strategy and who want to learn from success stories spanning a range of industries. Third, students of data science who want to understand both the theoretical and practical aspects of data science, vetted by real-world case studies at the intersection of academia and industry.

The end result of applying the techniques described here is a computer system that can store millions of documents, and retrieve the documents that contain any given combination of keywords in a matter of seconds or fractions of a second. Written for an eclectic audience of information professionals and for graduate courses. Sections for technically or theoretically oriented readers can be skipped by others without loss of continuity. Annotation copyright by Book News, Inc., Portland, OR

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