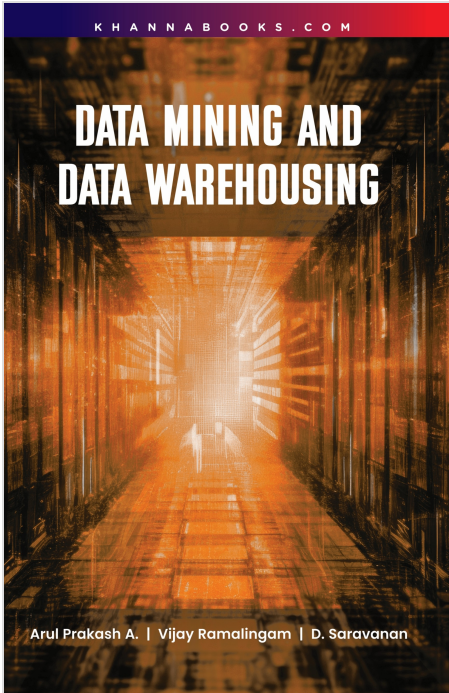




Data Mining and Data Warehousing

by Arun Prakash A., Vijay Ramalingam, D. Saravanan

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Description

In the contemporary digital age, where data has become the lifeblood of industries, the ability to effectively collect, store, and analyze massive volumes of information is paramount. Data Mining and Data Warehousing serves as an indispensable resource, offering a comprehensive and insightful exploration of these dynamic, interconnected disciplines. This book acts as a crucial bridge, guiding readers from foundational theoretical principles—such as the Knowledge Discovery in Databases (KDD) process—to cutting-edge practical applications required to navigate the modern, data-driven environment.

The core purpose of this text is to empower readers to extract implicit, previously unknown, and potentially useful patterns from large datasets, transforming raw information into strategic business decisions. The content is systematically structured, beginning with Data Preprocessing and Data Warehousing concepts like multi-dimensional modeling, OLAP operations, and various schemas (Star, Snowflake). It then thoroughly covers essential data mining techniques: Association Rule Mining, Classification and Prediction, and Cluster Analysis. Concluding with discussions on the social impacts and real-world applications in areas like financial analysis and the retail industry, this text is an invaluable tool for students in Computer Science and Data Science, IT professionals, and researchers seeking to leverage data for a competitive advantage.

Salient Features:

- **KDD & Preprocessing Focus:** Thoroughly explains the steps of Knowledge Discovery in Databases (KDD), including essential processes like data cleaning, integration, selection, and transformation, preparing raw data for effective mining.
- **Multidimensional Modeling:** Detailed coverage of Data Warehousing components, the Multi-Dimensional Data Model, and its schemas, such as Star and Snowflake. It also contrasts OLAP and OLTP systems.
- **Association Rule Mastery:** Explores mining frequent itemsets, associations, and correlations using powerful methods like Candidate Generation and FP-Growth, along with finding Multi-Level and Constraint-Based rules.
- **Classification & Prediction:** Deep dive into key predictive models, including Decision Tree Induction, Bayesian Classification (Naïve Bayes), Support Vector Machines (SVM), and neural networks like Backpropagation.
- **Comprehensive Clustering:** Systematically presents a wide range of clustering techniques, covering Partitioning (k-means), Hierarchical, Density-based (DBSCAN), and Model-based methods for effective group discovery.
- **Data Mining Architectures:** Explains the full system architecture, components, and functionalities of data mining systems and examines different integration schemes with data warehouses (e.g., tight coupling).
- **Real-World Case Studies:** Includes dedicated sections on the practical utility and social impacts of data mining, with case studies on applications like Financial Analysis, the Retail Industry, and mining the WWW and Text Databases.

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