

Preface to the First Edition

A data structure is defined as a group of data elements used for organizing and storing data. In order to be effective, data has to be organized in a manner that adds to the efficiency of an algorithm, and data structures such as stacks, queues, linked lists, heaps, and trees provide different capabilities to organize data.

While developing a program or an application, many developers find themselves more interested in the type of algorithm used rather than the type of data structure implemented. However, the choice of data structure used for a particular algorithm is always of the utmost importance. Each data structure has its own unique properties and is constructed to suit various kinds of applications. Some of them are highly specialized to carry out specific tasks. For example, B-trees with their unique ability to organize indexes are well-suited for the implementation of databases. Similarly, stack, a linear data structure which provides ‘last-in-first-out’ access, is used to store and track the sequence of web pages while we browse the Internet. Specific data structures are essential components of many efficient algorithms, and make possible the management of large amounts of data, such as large databases and Internet indexing services. C, as we all know, is the most popular programming language and is widespread among all the computer architectures. Therefore, it is not only logical but also fundamentally essential to start the introduction and implementation of various data structures through C. The course *data structures* is typically taught in the second or third semester of most engineering colleges and across most engineering disciplines in India. The aim of this course is to help students master the design and applications of various data structures and use them in writing effective programs.

About the Book

This book is aimed at serving as a textbook for undergraduate engineering students of computer science and postgraduate level courses of computer applications. The objective of this book is to introduce the concepts of data structures and apply these concepts in problem solving. The book provides a thorough and comprehensive coverage of the fundamentals of data structures and the principles of algorithm analysis. The main focus has been to explain the principles required to select or design the data structure that will best solve the problem.

A structured approach is followed to explain the process of problem solving. A theoretical description of the problem is followed by the underlying technique. These are then ably supported by an example followed by an algorithm, and finally the corresponding program in C language.

The salient features of the book include:

- Explanation of the concepts using diagrams
- Numerous solved examples within the chapters
- Glossary of important terms at the end of each chapter
- Comprehensive exercises at the end of each chapter
- Practical implementation of the algorithms using tested C programs
- Objective type questions to enhance the analytical ability of the students

- Annexures to provide supplementary information to help generate further interest in the subject

The book is also useful as a reference and resource to young researchers working on efficient data storage and related applications, who will find it to be a helpful guide to the newly established techniques of a rapidly growing research field.

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Comments and suggestions for the improvement of the book are welcome. Please send them to me at reemathareja@gmail.com

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