

PREFACE

C programming language offers several facilities to group data together in convenient packages, or *data structures*. With the emergence of C as the most popular language of implementation, it has been used in this book to extensively examine data structures.

This Book is Meant for...

Keeping in mind the level of beginners, the book is written without any prerequisites. It is an ideal textbook for students of various courses in Computer Science at the diploma, polytechnic, undergraduate and postgraduate levels, and also for new programmers who wish to know about the usage of different data structures in their project.

Student Friendly Approach...

Students will gain a good appreciation of the subject as this book has a clear display of syntax and abundant programming examples. To simplify concepts, the data structures are implemented using C language, in a step-by-step manner.

Organisation of the Chapters...

Having understood the difficulties faced by beginners, an introductory material with *fundamentals of data structure* and *an introduction to C language* is presented in Chapter 1. Chapter 2 deals with *strings, their representation and operation*. Chapter 3 is devoted entirely to *stack data structure* as the same has many applications in different fields of Computer Science and Engineering. Various stack operations, implementation issues, and applications of stack data structure are clearly explained in this chapter. The *queue data structure* and *its types* such as circular queue, deque and priority queue are described in Chapter 4 along with their operations, implementations and applications. Chapter 5 offers a clear understanding of *linked list data structure*. Chapter 6 details the concepts of *tree data structure*. It starts with basic terminology and describes tree representation, operations, types and applications with illustrative programs. *Graph data structure* with its use, representation, implementation and applications are introduced in Chapter 7. Chapter 8 is completely devoted to *sorting techniques* as it has many applications in various areas of Computer Science and Engineering. *Different searching techniques* and *search trees* are emphasised in Chapters 9 and 10 respectively. Recent advances in search trees, Binary Search Trees, AVL, B, B+ and Trie Structures are also included in Chapter 10. *File structure along with various access strategies* are presented in Chapter 11.

The Key Pedagogical Features are...

In essence, this book is totally self-contained and provides good number of illustrations and tested programs that demonstrate the concepts.

- Every chapter begins with *an introduction* that elucidates key topics and provides basic background.
- *Solved examples, tables, figures and flow diagrams* interspersed throughout the book are a valuable reference that simplifies the understanding of constructing modular and reusable structures.
- *Programming code* featuring precise instructions helps the reader implement practical data structures, thereby enhancing program reliability.
- *Review Yourself, Multiple Choice Questions and Programming Exercises* are included at the end of every chapter to reinforce the understanding of concepts.
- *Applications of each data structure* are explained through *concepts and programming examples*.
- *Web supplements* are a valuable resource for students and instructors. The online learning centre contains Additional Problems, Sample Tests, Web Links and Reference Titles for the students, and Solution Manual and chapter-wise PowerPoint Slides for the instructors.

This Book is Outstanding Because...

DATA STRUCTURES USING C is unique, in the sense that it deals with both theoretical and programming aspects of different data structures. The novelty of this book is that it not only covers all the concepts of data structures but also explains the implementation issues with tested programs in all the chapters.

Acknowledgements...

The authors wish to acknowledge the services rendered by their students in testing the sample programs. Sincere thanks are also due to the colleagues who have provided constructive criticism and feedback on the concepts presented in this book. The authors are grateful to Mr. S. Raja Vel (M/S Vel Raj Computer Centre) for his valuable assistance. The authors extend their appreciation to the editorial and publishing team of McGraw-Hill Education for their support in bringing out this book. The in-depth feedback of the following reviewers has been invaluable.

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Suggestions for improvement are welcome.