

# PROGRAMMING

in



for foundation

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## Preface

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This book is an introduction into the C programming language. Our aim is to provide a comprehensive discussion of the language, the run-time libraries, and style of C programming that emphasizes correctness, portability, and maintainability.

C is one of the most widely used languages of all times even though many other programming languages such as Basic, C++ and Java are used as introductions to programming language courses. However although it is a high-level programming language, C has features which may enable programming to be done more easily by beginners. Therefore, C acts as an appropriate language to be introduced for the purpose of teaching a general knowledge of application software and system development.

Since 1998, the Centre for Foundation Studies, International Islamic University Malaysia (IIUM), has been teaching C programming language in its computer science and engineering programmes, and it was realized that there is a need to develop and publish a basic textbook for the Introduction to Programming/Computer 2 course for foundation level students at the centre. Prior to the development and publication of this text, lecturers used various ANSI C texts, together with a compilation of lecturer notes and exercises in conducting the course.

No programming experience is needed for readers to understand the contents of this Foundation textbook since the book was written with learners in mind. In the process of writing, the authors took care to ensure that the content could be easily read and comprehended. Explanations and presentation have been kept as non-technical as possible throughout the book. The authors also incorporate an effective pedagogical approach based on learning theories such as Gagne 9 events which have been used by instructors from this centre who have taught C programming for many years. Additionally, many programming examples and exercises have been prepared to consolidate the reader's understanding and many sources have been referred to in order to ensure the credibility and the reliability of all contents.

# PROGRAMMING in C for foundation

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This book on C programming language is a comprehensive tutorial and reference to C based on the ANSI C standard for beginners. The C language is demonstrated with numerous examples and extensive exercises that guide readers through each concept. Step-by-step of program code reveal the underlying logic of the programs and include in-depth implementation details. Features in this book include comprehensive programming examples and exercises; and an expanded appendix of Numbering System, ASCII Code, and DevC++ tutorial. In addition, there is more emphasis on variable Data Types, which provides the reader with a foundation for working with variables and facilitates programming in the problem domain. Beginners' programmers alike will benefit from the numerous examples and extensive exercises developed to guide readers through each concept. Program codes illuminate the correct usage and syntax of C language and reveal the underlying logic of application. The clarity of exposition and format of the book make it an excellent reference to first step programmers. It is intended for use in either a foundation level or first year programming course.

Chapter 1, "Introduction to C programming," presents an overview of the language. After reading this chapter, the reader will already be able to describe the program development life cycle and write C code. Chapter 2, "Fundamentals of C" gives a thorough introduction to the data in C programs. This information will benefit the reader needing to declare assign and initialize data variables. Small but useful examples are provided to describe important technical points. Chapter 3 has a careful discussion of "Control Structures" which is often a mystifying topic for the beginner. The chapter describes logical and relational operations, if-else and switches selection, and the iterations (while, do-while, and for loops). Chapter 4 "Modularity using functions" identifies the two types of functions in C the built-in and user defined functions. Chapters 5 and 6 cover the application level of C language feature by feature. Many advanced topics of "Arrays" and "Strings" are discussed. Search and sort as well as passing arrays between functions are demonstrated in chapter 5 the longest chapter in the book. The use of strings is illustrated in Chapter 6. The chapter demonstrates the concept of character and strings functions. Since the chapters are self-contained, the knowledgeable reader can skip to particular sections as needed.

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