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Programming and Problem-solving in Algol 68

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Preface

The title of this book is carefully chosen—the main topic is the art of solving problems by programming. The book is intended to appeal to those who believe, like the author, that there is more to this subject than mere knowledge of a programming language. Thus the ‘Algol 68’ of the title plays a vital but secondary supporting function.

Although much of the book is necessarily about the mechanics of writing programs, I have tried to convey some of the important ideas of programming as a practical discipline—reliability, robustness, economy (considered in a global sense) and structure, both in data and program.

Since the over-all length of the book is limited, I have included only those parts of Algol 68 that would normally be found in a first-year undergraduate course. Omissions—which the reader will be able to fill from other books devoted primarily to Algol 68—include computing with references, unions, the definition of operators, formats, use of the backing store, and finally labels and **goto** commands. This selection has the additional advantage that the subset that remains is available, with minor variations of dialect, on all existing versions of Algol 68.

Mental models are of great help in understanding complex phenomena. I should perhaps make clear that the ‘identifier table’ described in chapter 7 is such a model. The reader can safely take this account literally, and it will help him to write correct efficient programs. Later, if he ever studies the design of compilers, he may discover that the same effect can be reached in other more complex ways.

My thanks are due to a great number of people: to two successive first-year classes at Strathclyde University who used preliminary drafts of the book as lecture notes; to Miss Agnes Wisley, who typed the manuscript; to Dr Charles Lindsey, who as referee made many helpful suggestions and to my wife, who drew sketches for the pictures, tracked down the quotations at the head of each chapter, and gave me constant encouragement. The book itself is dedicated to my mother, Mrs Vera Colin, without whom it would not have been.

Note on Exercises

Each chapter in this book is followed by a set of exercises. The number in brackets at the beginning of each exercise is an estimate of its difficulty. The scale ranges from 0 (trivial) to 10 (hard).

The last exercise is usually marked P for practical. This indicates that an actual computer solution is suggested.

A suitable rate for the exercises is about one set (including the practical) each week.

The exercises marked* have worked solutions at the end of the book.