mathematical models. Various sections have been simulated using SOL (Knuth and McNeley, 1964), and from the data gathered on the log punch, an attempt will be made to construct a Markov model. By varying the parameters of the system, such as the number of people logged in at any one time, the number and size of the various buffers, and the disc queue algorithm, some insight into the information necessary to construct and test a model of this form should be obtained. Looking further ahead, it is hoped to develop a high-level language for a re-write of the system (the original being written in assembly language for the usual, mostly invalid, reasons).

Conclusion

This work has shown that a non-interactive system of this type using a satellite computer to provide ready manipulation of user files has much to commend it, especially in an environment where throughput of work on the main computer is of prime importance. It should also be noted that a change in the large machine involves, apart from the hardware interface, changes to the code of the RUN command, and file translation, only. Thus continuity of system can be provided when upgrading the main computer to a new generation of hardware.

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Book reviews

Introduction to Formal Grammars, by M. Gross and A. Lentin, 1970; 230 pages. (*George Allen & Unwin Ltd.*, £4·75)

This is a textbook based on lectures given to University students by the authors. Only formal syntax theory is treated, and there is no attempt to consider issues like practical parsing algorithms. The approach is strongly influenced by the algebraic methods which have been so extensively developed in France, but the authors have deliberately avoided being over-mathematical, and there is an ample number of well chosen examples to illustrate each successive point. Students with a variety of backgrounds could follow it.

The first third of the book is a résumé of combinatorics, computability, and formal systems. Next there is a good, clear, presentation of the basic theory of context-free and finite-state languages, with a brief note on context-sensitive languages. The last quarter of the book is entitled 'The Algebraic Point of View'. This section is the unique contribution of the book. It gives a very readable introduction to viewing context-free languages firstly as mappings of Dyck languages, and secondly, as formal power series. A good introduction to these topics has been lacking up to now, and the authors have now provided an admirable reference.

A weakness is that only developments up to about 1965 are presented. Thus, there is no mention of precedence grammars, LR(k) grammars, and other advances which have linked the theory more closely with computing. It would be worthwhile bringing this work up to date. An irritation is that there is no subject index.

The crisp, lucid, style of this book makes one want to see more English translations of French work on computing science.

J. J. FLORENTIN (London)

An Introduction to Industrial Mathematics, by M. Rothman, 1970; 370 pages. (*G. T. Foulis & Co. Ltd.*, £6)

It is difficult to decide precisely what need this book aims to fill. According to the author's introduction, he aims to indicate the (mathematical) requirements of industry to the new graduate, or the final year student, so that he may decide on his rightful career at the earliest opportunity. One asks, however, what kind of new graduate? A mathematics graduate scarcely needs chapters on 'Trigonometry and complex variable' or 'Differentiation' or (elementary) 'coordinate geometry'. Even an engineering graduate, who has attended the usual 3 to 4 hours per week of mathematics lectures, will already be familiar with nine-tenths of the material in the book, and, indeed a good half of the material is taught in Advanced Level GCE syllabuses.

On the other hand the book could certainly not be used as a teaching book, for almost nothing is proved, and most of the topics are dealt with in a very sketchy manner—the more difficult a topic, the less detail is offered.

Perhaps then, the book aims to be a kind of mathematics handbook for engineers—a quick easy reference book to the most useful parts of mathematics? In this too it fails. Methods (e.g. partial fractions) which are notoriously tricky, are given scant treatment. Partial differential equations are thought not worthy of mention— nor are special functions or approximating polynomials.

The one virtue of the book is that it may indicate to a mathematics lecturer the mathematical methods which one industrial mathematician has found useful. But £6 is a big price for such information.

J. W. CRAGGS (Southampton)