

effectiveness for the solution of systems of linear elliptic difference equations in the plane. Included is a survey of theoretical results comparing the effectiveness of alternating direction methods with systematic overrelaxation methods. In addition, results of some systematic numerical experiments performed to test the comparative effectiveness of the various methods are presented.

P. Wolfe's paper, *Recent Developments in Nonlinear Programming*, surveys methods of solving programming problems which involve maximizing a concave objective function subject to a set of constraints specified by inequalities which taken together specify a convex set. The lack of information concerning the relative computational efficiency of many of the methods is pointed out.

E. F. Codd defines multiprogramming as "the technology associated with the concurrent execution of instructions which are not restricted to being immediate neighbors in any instruction string." He discusses the role which multiprogramming can play in various environments. A system for "batch multiprogramming" on a STRETCH-like system with one processing unit is outlined. Problems associated with scheduling runs and allocating parts of the computer system to various programs in order to minimize the running time for a set of runs are considered. Finally, multiprogramming system requirements are reviewed in the case where two or more processing units are involved, and the implementation of multiprogramming systems in this case is discussed.

H. K. Skramstad, in a chapter entitled *Combined Analog-Digital Techniques in Simulation*, surveys a number of interconnected analog-digital systems. He indicates some areas of applying such systems as well as some methods of combining them.

R. C. Lawler's stated purpose in a report on *Information Technology and the Law* is "to provide an overview of the activity occurring at the interface between information technology and law and to suggest which problems may be most significant from the standpoint of the lawyer, the courts, and the public as a whole." A broad range of subjects is included from the use of computers in the retrieval of legal information and in predicting court decisions to some of the legal problems posed by the use of information in a computer, such as possible copyright infringements, for example.

The editors are to be commended in their continuing successful efforts to bring together well written surveys of representative areas from the broad field of computer science and technology "as an antidote to specialization."

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63[Z].—C. ANDERSEN, *An Introduction to ALGOL 60*, Addison-Wesley, Reading, Mass., 1964, vi + 57 pp., 28 cm., plus foldout ALGOL Syntactical Chart. Price \$1.75.

This book is a well organized introduction to ALGOL: it deals progressively with the elements and constructions of the language and with the uses to which it may be put. Instructive examples are placed at strategic points in the text, which is eminently suited to the teaching methods currently in use in American universities.

The author has adopted the hardware conventions associated with the machine (GIER) with which he is most familiar; furthermore, he devotes one chapter to certain additions to ALGOL which increase the efficiency of the programs produced by the GIER compiler. The instructor who uses this book as a text may well wish to make certain modifications concerning these points. He may also wish to place slightly more emphasis upon such matters as conditional statements in arithmetic expressions—which are relegated to an appendix, on recursive procedures—to which only fleeting reference is made, and to own variables which are dealt with not at all.

There are a few typographical errors (for example on page 3 two signs, \neq and $=$, should be interchanged, and on page 53 there is a redundant open bracket), though mistakes of this nature occurring in the ALGOL texts will doubtless either be recognized by anomalous functioning of the program or be picked up by the ALGOL monitor.

The publishers are to be congratulated on their enlightenment in offering this book at such a moderate price.

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64[Z].—KARL-HEINZ BÖHLING, *Zur Strukturtheorie sequentieller Automaten*, Forschungsberichte des Landes Nordrhein-Westfalen, No. 1279, Westdeutscher Verlag, Opladen, 1964, 73 pp., 23 cm. Price DM 45. (Paperback)

The author defines a *sequential system* as a triple $\langle \epsilon, G, F \rangle$, where ϵ is the union of disjoint sets θ (comprising input and output alphabets) and S (the set of states), and where $G \subseteq \theta \times S \times S$ and $F \subseteq \theta \times S \times \theta$ are ternary relations on ϵ corresponding, respectively, to the transition and output functions of a conventional deterministic sequential machine. The apparent purpose of this monograph is to show that sequential systems are sufficiently general to embrace all of the principle models current in automata theory, including incompletely specified machines, nondeterministic machines, Rabin-Scott machines, and abstract (Ginsburg) machines among others—a conclusion that is hardly surprising. Aside from this, a tedious attempt is made to develop a formalism for distinguishing among the various types of machines, considered as sequential systems.

As the author grants in his introduction, no attempt is made to generalize, unify, or even present the existing theories, though he promises to deduce some consequences in a subsequent publication. At least until this program is carried out and the sequential system is shown to be a fruitful generalization, one must regard the present work as virtually useless, either as a text or a reference book.

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65[Z].—ROY DUBISCH, *Lattices to Logic*, Blaisdell Publishing Co., New York, 1964, vii + 88 pp., 20 cm. Paperback. Price \$1.65.

This treatment of lattices, sets, switching circuits and logic is written primarily for mathematical beginners. Partially ordered systems and lattices are introduced