Bibliography of Nonparametric Statistics, compiled by I. R. Savage. Harvard University Press, 1962. 284 pages. $6.50.

This is an up to date version of a bibliography of articles on Nonparametric Statistics by I. R. Savage that appeared in the Journal of the American Statistical Association in 1953 (See Math. Reviews 1954).

There is, however, an interesting feature of this bibliography that merits comment, namely the inclusion of a list of the users of the various articles listed. As an example, anybody who is interested in order statistics and their use in nonparametric work and who knows of S. S. Wilks' article on this topic, will, by looking up this author, find the following entry on page 272 - Wilks, S. S. (1948), "Order Statistics", Bull. Amer. Math. Soc. 54, 6-50. Review: MR (1948) 601. Users: Noether (1948), P. O. Johnson (1949), ... (some 26 other references) ..., Siddiqui (1960).

This feature, as can well be imagined, is most helpful for many reasons.

Irwin Guttman, McGill University

An Introduction to Mathematical Machine Theory, by S. Ginsburg. Addison-Wesley, Reading, Mass., 1962. ix + 148 pages. $8.75.

This book is concerned not with any actual computers or other data processors, but with an abstract treatment of certain of their logical archetypes. There are four chapters: Complete sequential machines, incomplete sequential machines, abstract machines, recognition devices. The central concept for the first three chapters is that of a sequential machine, roughly, a black box which accepts certain inputs, produces certain outputs and is itself in a certain state; the sets of possible inputs, outputs and states are finite; each current state depends on the previous state and input, and so does each current output. If for each state-input pair both the next output and the next state are defined, one has a complete sequential machine. If this condition is relaxed one obtains an incomplete sequential machine. A further generalization leads to an abstract machine, --here the sets of inputs, states and outputs may be countably infinite and the inputs (or outputs) need not all be independent.

The main interest centers around the behaviour of the machine in response to a given sequence of inputs, and in the problem of defining equivalences between machines, reducing machines to equivalent ones with minimal number of states, and the synthesis of machines under certain specifications on inputs, outputs and states.

Recognition devices of the last chapter arise as an abstraction

from the pattern recognition problem: given a finite set A_1, A_2, ..., A_n of characters, e.g., printed letters (with any letter considered identical in all its occurences), to obtain a device with the inputs A_i and the corresponding outputs i.

The main tools used are combinatorics, relations and semi-groups; proofs are elementary but often intricate. The book is not elementary nor, in spite of its title, introductory, and it is quite technical; however, it should be of considerable interest to its limited audience.

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Theory of Value, (Monograph 17, Cowles Foundation), by G. Debreu. John Wiley and Sons, New York, 1959. xii + 114 pages. $4.75.

The pervasive influence of Bourbaki is spreading - this book might be sub-titled: Economics a la Bourbaki. There are seven chapters: 1) Mathematics, 2) Commodities and Prices, 3) Producers, 4) Consumers, 5) Equilibrium, 6) Optimum, 7) Uncertainty, each provided with short bibliographical notes, a general bibliography of four and a half pages and a fairly exhaustive index. The central chapters are 5) and 6) in which the previously developed machinery is used to prove rigorously some general theorems on the existence of equilibria for an economy, and on optimal equilibria. The first chapter contains in its 27 pages the necessary set-theory, theory of relations, topology, real numbers, functions, continuity, vector spaces, convexity and fixed-point theorems; it is very pleasing to see the statement that "... it requires, in principle, no knowledge of mathematics". However, these concepts are illustrated as they come to be used, e.g., a set is connected if it is of one piece, etc. The notation is quite unnecessarily heavy with sub-, super-, and in-scripts and iterated indices. In brief, this is an excellent introduction to an important branch of economics for mathematicians and for those economists who have an iron determination and a very patient mathematician at their private disposal.

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