REVIEWS AND DESCRIPTIONS OF TABLES AND BOOKS

1[C, K, L]. GERALD J. LIEBERMAN & DONALD B. OWEN, *Tables of the Hypergeometric Probability Distribution*, Stanford University Press, California, 1961, 7 + 726 p., 24 cm. Price \$15.00.

In this volume there are three main tables of the hypergeometric probability distribution and a table of logarithms of factorials. The nomenclature of sampling inspection is used to describe the parameters of the hypergeometric probability distribution. The main tables give the values of $p(x) = p(N, n, k, x)$ and $P(x) = P(N, n, k, x)$, where

N = number of items in a lot,
n = number of items in a sample taken from the lot,
k = number of defective items in the lot,
x = number of defective items observed in the sample.

Then, the probability

$$p(x) = \Pr\{\text{Exactly } x \text{ defectives are found in sample}\}$$
$$= \frac{k!\,n!}{(k-x)!\,(n-x)!\,x!} \cdot \frac{(N-k)!\,(N-n)!}{N!(N-k-n+x)!},$$

x being an integer such that $[0, n + k - N] \leqq x \leqq \min\,[n, k]$, and $P(x) = Pr\,\{x$ defectives or fewer are found in sample$\}$

$$= \sum_{i=M}^{x} \frac{k!\,n!}{(k-i)!\,(n-i)!\,i!} \cdot \frac{(N-k)!\,(N-n)!}{N!(N-k-n+i)!},$$

where $M = \max\,[0, n + k - N]$.

The first table lists the values of $p(x)$ and $P(x)$ to six decimal places for $N = 2(1)49$, $50(10)100$, $n = 1(1)\ N - 1$, $k = 1(1)\ n$, $x = 0(1)\ k$, for $N \leqq 25$. For $N > 25$, the values of $p(x)$ and $P(x)$ are given only up to

$$n = \frac{N}{2} \quad \text{or} \quad n = \frac{N-1}{2},$$

N even or odd, respectively. The authors note that by the use of certain symmetry relationships, all possible $p(x)$ and $P(x)$ can be obtained.

The second table gives the values of $p(x)$ and $P(x)$ to six decimal places for $N = 1000$, $n = 500$, $k = 1(1)\ 500$, $x = 0(1)\ k/2$ (k even), $(k - 1)/2$ (k odd). Entries are omitted when $p(x) < 10^{-6}$.

The third table gives the values of $p(x)$ and $P(x)$ to six decimal places for $N = 100(100)\ 2000$, $n = \frac{1}{2}N$, $k = n - 1, n$, and $x = 0(1)\ n/2$ (n even), $(n - 1)/2$ (n odd). Entries are omitted when $p(x) < 10^{-6}$.

The fourth table is a list of log $N!$ for $N = 1(1)\ 2000$ taken from *Logarithms of Factorials from 1 to 2000*, by D. B. Owen and C. M. Williams, Sandia Corporation Monograph SCR-158, December 1959. Values of log $N!$ in this table are given to fifteen decimal places, and were used for the calculation of $p(x)$ and $P(x)$. The values of $p(x)$ and $P(x)$ in all tables are claimed to have been computed correct to at least eight decimal places before they were rounded to six decimal places.

The introductory part of this volume includes the definitions of the hypergeometric function and the various symmetry relationships, applications, approximations and interpolations, a summary of some useful formulas on sums of combinatorials, and a bibliography of 66 references. Examples given in applications include sequential procedure, test of the equality of two proportions, distribution of the number of exceedances, Bayesian prediction, and sampling inspection.

The reviewer's immediate reaction to these tables is that the type face is too small for easy reading and that the format makes it difficult to find the values of the indexing parameters. However, considering the 135,874 entries and the 726 pages, it would be difficult to eliminate these faults without prohibitive increase in both the size and cost of this volume.

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2[G, I, X, Z]. Ralph G. Stanton, *Numerical Methods for Science and Engineering*, Prentice-Hall, Inc., Englewood Cliffs, N. J., 1961, xii + 266 p., 23 cm. Price $9.00.

This book is designed as a textbook for an introductory course in numerical methods for students in the physical sciences and engineering with a good knowledge of calculus and differential equations. The selection of topics is fairly standard, as one would gather from the following chapter headings: Ordinary Finite Differences, Divided Differences, Central Differences, Inverse Interpolation and the Solution of Equations, Computation with Series and Integrals, Numerical Solution of Differential Equations, Linear Systems and Matrices, Solution of Linear Equations, Difference Equations, Solution of Differential Equations by Difference Equation Methods, and the Principles of Automatic Computation.

The author states that the book was developed from the standpoint of hand and desk-calculator techniques, and justifies this on the grounds of his belief that "the majority of workers in science and engineering can make great use of numerical methods without perhaps ever encountering a problem of sufficient length or complexity to justify programming it for an electronic computer." His final chapter, containing only eighteen pages about automatic computation, seems to confirm one's belief that the author views the modern field of numerical computation with automatic electronic computers as a spectator rather than as a participant.

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3[G, S]. Taro Shimpuku, "General Theory and Numerical Tables of Clebsch-Gordan Coefficients," *Progr. Theoret. Phys.*, Kyoto, Japan, Supplement No. 13, 1960, p. 1–135.

General formulas for the Clebsch-Gordan coefficients $(j_1j_2m_1m_2 \mid j_1j_2jm)$, in the notation of Condon and Shortley [1], have been given by Wigner and by Racah [2], [3]. These formulas are very complex and computationally inconvenient. Shimpuku states: "Here we derive a new general expression of $C - G$ coefficients