NEW CAMBRIDGE STATISTICAL TABLES

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CONVENTION. To prevent the tables becoming too dense with figures, the convention has been adopted of omitting the leading figure when this does not change too often, only including it at the beginning of a set of five entries, or when it changes. (Table 23 provides an example.)

PREFACE TO THE FIRST EDITION

The raison d'être of this set of tables is the same as that of the set it replaces, the *Cambridge Elementary Statistical Tables* (Lindley and Miller, 1953), and is described in the first paragraph of their preface.

> This set of tables is concerned only with the commoner and more familiar and elementary of the many statistical functions and tests of significance now available. It is hoped that the values provided will meet the majority of the needs of many users of statistical methods in scientific research, technology and industry in a compact and handy form, and that the collection will provide a convenient set of tables for the teaching and study of statistics in schools and universities.

The concept of what constitutes a familiar or elementary statistical procedure has changed in 30 years and, as a result, many statistical tables not in the earlier set have been included, together with tables of the binomial, hypergeometric and Poisson distributions. A large part of the earlier set of tables consisted of functions of the integers. These are now readily available elsewhere, or can be found using even the simplest of pocket calculators, and have therefore been omitted.

The binomial, Poisson, hypergeometric, normal, χ^2 and t distributions have been fully tabulated so that all values within the ranges of the arguments chosen can be found. Linear, and in some cases quadratic or harmonic, interpolation will sometimes be necessary and a note on this has been provided. Most of the other tables give only the percentage points of distributions, sufficient to carry out significance tests at the usual 5 per cent and 1 per cent levels, both one- and two-sided, and there are also some 10 per cent, 2·5 per cent and 0·1 per cent points. Limitation of space has forced the number of levels to be reduced in some cases. Besides distributions, there are tables of binomial coefficients, random sampling numbers, random normal deviates and logarithms of factorials.

Each table is accompanied by a brief description of what is tabulated and, where the table is for a specific usage, a description of that is given. With the exception of Table 26, no attempt has been made to provide accounts of other statistical procedures that use the tables or to illustate their use with numerical examples, it being felt that these are more appropriate in an accompanying text or otherwise provided by the teacher.

The choice of which tables to include has been influenced by the student's need to follow prescribed syllabuses and to pass the associated examinations. The inclusion of a table does not therefore imply the authors' endorsement of the technique associated with it. This is true of some significance tests, which could be more informatively replaced by robust estimates of the parameter being tested, together with a standard error.

All significance tests are dubious because the interpretation to be placed on the phrase 'significant at 5%' depends on the sample size: it is more indicative of the falsity of the null hypothesis with a small sample than with a large one. In addition, any test of the hypothesis that a parameter takes a specified value is dubious because significance at a prescribed level can generally be achieved by taking a large enough sample (cf. M. H. DeGroot, *Probability and Statistics* (1975), Addison-Wesley, p. 421).

All the values here are exact to the number of places given, except that in Table 14 the values for $n > 17$ were calculated by an Edgeworth series approximation described in 'Critical values of the coefficient of rank correlation for testing the hypothesis of independence' by G. J. Glasser and R. F. Winter, *Biometrika* **48** (1961), pp. 444–8.

Nearly all the tables have been newly computed for this publication and compared with existing compilations: the exceptions, in which we have used material from other sources, are listed below:

> Table 14, $n = 12$ to 16, is taken from 'The null distribution of Spearman's S when $n = 13(1)16$', by A. Otten, *Statistica Neerlandica*, **27** (1973), pp. 19–20, by permission of the editor.
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> Table 24, $k = 6$, $n = 5$ and 6, is taken from 'Extended tables of the distribution of Friedman's S-statistic in the two-way layout', by Robert E. Odeh, *Commun. Statist. – Simula Computa.*, **B6** (1), 29–48 (1977), by permission of Marcel Dekker, Inc., and from Table 39 of *The Pocket Book of Statistical Tables*, by Robert E. Odeh, Donald B. Owen, Z. W. Birnbaum and Lloyd Fisher, Marcel Dekker (1977), by permission of Marcel Dekker, Inc.
>
> Table 25, $k = 3$, 4, 5, is partly taken from 'Exact probability levels for the Kruskal–Wallis test', by Ronald L. Iman, Dana Quade and Douglas A. Alexander, *Selected Tables in Mathematical Statistics*, Vol. 3 (1975), by permission of the American Mathematical Society; $k = 3$ is also partly taken from the MS thesis of Douglas A. Alexander, University of North Carolina at Chapel Hill (1968), by permission of Douglas A. Alexander.

We should like to thank the staff of the University Press for their helpful advice and co-operation during the printing of the tables. We should also like to thank the staff of Heriot-Watt University's Computer Centre and Mr Ian Sweeney for help with some computing aspects.

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PREFACE TO THE SECOND EDITION

The only change from the first edition is the inclusion of tables of Bayesian confidence intervals for the binomial and Poisson distributions and for the square of a multiple correlation coefficient.

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