TABLE FOR ESTIMATING THE GOODNESS OF FIT OF EMPIRICAL DISTRIBUTIONS

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1. Editorial Note. The table presented on pp. 280–281 was originally published in [1]. It gives values of

$$L(z) = 1 - 2\sum_{\nu=1}^{\infty}(-1)^{\nu-1}e^{-\nu^2 z^2} = (2\pi)^{\frac{1}{2}} z^{-1}\sum_{\nu=1}^{\infty} e^{-(2\nu-1)^2\pi^2/8z^2},$$

which is also derived in [2].

Let $(X_1, \cdots, X_n)$ be a sample of independent variables with the same continuous cumulative distribution function $F(x)$, and let $N(z)$ be the number of X_k which are $\leq z$. By empirical distribution is meant the step-function $F_n^*(z) = N(z)/n$. The maximum D_n of the difference $|F_n^*(z) - F(z)|$ is a random variable and $L(z)$ is the limiting cumulative distribution function of $n^{1/2}D_n$. If $D_{m,n}$ is the maximum of the difference $|F_m^*(z) - F_n^{**}(z)|$ between the empirical distributions of two independent samples of sizes m and n, respectively, then $L(z)$ is also the limiting cumulative distribution function of $(mn/(m+n))^{1/2}D_{m,n}$.

REFERENCES

[1] N. Smirnov, "On the estimation of the discrepancy between empirical curves of distribution for two independent samples," *Bulletin Mathématique de l'Université de Moscou*, Vol. 2 (1939), fasc. 2.

[2] W. Feller, "On the Kolmogorov-Smirnov limit theorems for empirical distributions," *Annals of Math. Stat.*, Vol. 19 (1948), pp. 177–189.