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ABSTRACTS OF PAPERS

(*Abstracts of papers presented at the Western Regional meeting, Las Vegas, Nevada, March* 22–24, 1971.)

128-1. Some probability inequalities related to the law of large numbers. R. J. TOMKINS, University of Saskatchewan, Regina.

Let $X_1, X_2, \cdots, X_n$ $(n > 1)$ be random variables (rv) and define $S_k = X_1 + \cdots + X_k$. Upper bounds of the Hájek–Rényi type are presented for $P(\max_{1 \leqq k \leqq n} \phi_k S_k \geqq \varepsilon \mid \mathscr{G})$ where $\phi_1 \geqq \cdots \geqq \phi_n > 0$ are rv, $\varepsilon > 0$ and $\mathscr{G}$ is a σ-field. The theorems place no further assumptions on the X_k's; some, in fact, do not even require the integrability. It is shown, however, that if the X_k's are independent or form a submartingale difference sequence, then some well-known inequalities follow as consequences of these theorems. (Received December 30, 1970.)

128-2. Convergence to random binary digits when none of initial data necessarily independent. JOHN E. WALSH and GRACE J. KELLEHER, Southern Methodist University and University of Texas at Arlington.

Desired is a set of very nearly random binary digits (very closely represent independent flips of an ideal coin with sides 0 and 1). Available is $m \times n$ array of approximately random binary digits obtained experimentally. No one of these digits is necessarily independent of any of the others but the level of dependence among rows is very small. A method is given for compounding these digits to obtain a smaller set that is much more nearly random. The randomness of a set of digits is measured by its "maximum bias." A set is very nearly random if its maximum bias is very small. A maximum bias for compounded digits is determined from: The compounding method, the largest contribution to the maximum bias from within rows, and the largest contribution from the dependence among rows (very small). The maximum bias for a compounded set can be very small (even when the maximum bias for the initial set is quite large) but has a lower bound depending on the bias contribution from dependence among rows. One approach is oriented toward minimizing m for a given maximum bias for the compounded set, so that obtaining the initial set is simplified. Another approach is oriented toward having the number of compounded digits a reasonably large fraction of the number in the initial set. (Received January 5, 1971.)

128-3. Maximal resolution V fractions of 2^n designs having 2^q runs. R. C. JUOLA, Boise State College.

The maximum number of factors which can be accommodated in a resolution V fraction of a 2^n design having 2^q runs is the largest integer solution of $n^2 + n \pm 2 \leqq 2^{q+1}$. Techniques developed by John and Juola (submitted *Ann. Math. Statist.*) are utilized to construct designs which achieve this maximum number of factors for $3 \leqq q \leqq 9$. This work extends the work of many authors (see Draper and Mitchell, *Ann. Math. Statist.* **39**, (1968) 246–55) who have found this maximum for the $2^{n-p}(p+q = n)$ series of fractional factorial designs. (Received January 5, 1971.)

128-4. Nonhomogeneous filtered Poisson processes in m-dimensional Euclidean space. H. W. LORBER, EG&G, Inc.

Several topics are discussed in the theory of nonhomogeneous filtered Poisson processes (NFPP's) defined in real multidimensional Euclidean spaces R_m. The topics that are discussed are novel or else do not follow trivially from extensions of the one-dimensional theory. A set of readily applicable conditions are proved sufficient for a process to be Poisson in R_m, and relations