Notices Amer. Math. Soc., Vol 17, No 4, June 1970

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70T-A106. JOHN A. WRIGHT, University of Rochester, Rochester, New York 14627.
There are 718 6-point topologies, quasi-orderings, and transgraphs.

The numbers of topologies, transitive directed graphs, and reflexive transitive relations on n points are the same. These relations may be denoted by certain (0,1)-matrices. The T_0 topologies correspond to the antisymmetric relations (partial orderings). Evans, Harary and Lynn, in Comm. ACM (1967) counted all these relations by computer for n distinct points, $n \leqq 7$. We have counted the equivalence classes by computer for $n \leqq 6$. Let h_n = number of classes; h_n^c = connected classes; $h_n^0 = T_0$ classes; h_n^{c0} = connected T_0 classes. Their values are respectively, for n = 5: 139, 94, 63, 44, and for n = 6: 718, 512, 336, 238. We use the following recursions: Let a partition of n be represented by $n = \sum r_i n_i$, $n_1 < \ldots < n_k$, $r_i \geqq 1$. Then $h_n = \sum \prod_{i=1}^k \mathrm{Comb}(h_{n(i)}^c + r_i - 1; r_i)$ where $\mathrm{Comb}(a; b) = a!/b!(a-b)!$ and summation is over all partitions of n. A similar relation holds between h_n^0 and $h_{n(i)}^{c0}$. A list of the connected 6-point quasi-orderings, in the form of diagrams, is available on request. (Received March 17, 1970.) (Author introduced by Professor Arthur H. Stone.)

Notices A.M.S., Vol 19, No. 5, 1972

696-06-1. JOHN A. WRIGHT, University of Prince Edward Island, Charlottetown, Prince Edward Island, Canada. Cycle indices of certain classes of types of quasiorders or topologies. Preliminary report.

Let K be any class of isomorphism types of quasiorders on $x_1, \ldots, x_n$. Define a polynomial $Z(K)(s_1, s_2, \ldots)$ as the sum of the cycle indices of automorphism groups of arbitrary members of the types in K. It is shown that $k = |K|$ is the sum of the coefficients and $k' = |\bigcup K|$ is n! times the coefficient of s_1^n. Let Q_n be the class of types of n-point quasiorders (equivalently, topologies). Let P_n be the types of partial orders (T_0 topologies). Let QC_n and C_n be the types of quasiorders (respectively, partial orders) connected by comparability equivalently, connected topologies. We define three other classes $\subset P_n$, of which one called S_n is contained in the others, and show how the polynomials for the rest of the classes mentioned can be derived from those of S_m, $m \leqq n$. We construct S_m for $m \leqq 7$, derive the polynomials, and obtain among other results the following: For n = 6: c = 238, qc = 512, p = 318, q = 718; c' = 101642, qc' = 158175, p' = 130023, q' = 209527. For n = 7, the corresponding values are 1650, 3485, 2045, 4535; 5106612, 7724333, 6129859, 9535241. Evans, Harary and Lynn (Comm. ACM (1967)) obtained the same values of p' and q' by computer construction. (Received February 22, 1972.)

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JA Wright
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(2 abstracts)

add to 3 seqs

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    repeat
    print (B)
    success
end NSORT
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... unsuccessful ... sequences of choices leading to ... a "correct" element is defined relative to any ... of these sequences. Whenever successful termination is possible, a nondeterministic machine makes a sequence of choices that is a shortest sequence leading to a successful termination. Since the machine we are defining is fictitious, it is not necessary for use to concern ourselves with