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 $n \leq 7$. We have counted the equivalence classes by computer for $n \leq 6$. Let $h_n$ = number of classes; $h^C_n = \text{connected classes}$; $h^0_n = T_0 \text{classes}$; $h^{C0}_n = \text{connected T}_0 \text{classes}$. 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 $n = \sum r_i n_i; n_i \leq \cdots \leq n_k, r_i \neq 1$. Then $h_n = \sum_{k=1}^{n} \text{Comb}(h^C_{n-k} + r_i - 1; r_i)$ where $\text{Comb}(a; b) = a!/b!(a-b)!$ and summation is over all partitions of $n$. A similar relation holds between $h^0_n$ and $h^{C0}_n$. 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.)

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 $k' = |\cup K|$ 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 $P_m$, 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 $S_m, m \leq n$. We construct $S_m$ for $m \leq 7$, derive the polynomials, and obtain among other results the following:

For $n = 6$: $e = 238$, $q_c = 512$, $p = 318$, $q = 718$; $c^t = 101642$, $q_c^t = 158175$, $p^t = 136023$, $q^t = 209627$. For $n = 7$, the corresponding values are 1650, 3495, 2045, 4538; 5106612, 7724333, 6129859, 9535241. Evans, Harary and Lynn (Comm. ACM (1967)) obtained the same values of $p^t$ and $q^t$ by computer construction. (Received February 22, 1972.)
One of the zero or one as their output, i.e., a binary decision is made. For a neural network, the decision algorithms such as the perceptron algorithm and the decision tree algorithm are used. However, these algorithms may not be effective when the data is not linearly separable. To overcome this, more advanced algorithms like the support vector machine (SVM) can be used.

The making of additional copies may be subject to copyright law.