Statistics of partial permutations via Catalan matrices

Hsiang-Chun Hsu
Department of Mathematics
Tamkang University

Abstract

A generalized Catalan matrix $(a_{n,k})_{n,k\geq 0}$ is generated by two seed sequences $\mathbf{s} = (s_0, s_1, \ldots)$ and $\mathbf{t} = (t_1, t_2, \ldots)$ together with a recurrence relation. By taking $s_\ell = 2\ell + 1$ and $t_\ell = \ell^2$ we can interpret $a_{n,k}$ as the number of partial permutations, which are $n \times n$ $0,1$-matrices of k zero rows with at most one 1 in each row or column. In this talk we show that most of fundamental statistics and some set-valued statistics on permutations can also be defined on partial permutations and be encoded in the seed sequences.