

IRREDUCIBLE CHARACTERS OF THE SYMMETRIC GROUP AS SYMMETRIC FUNCTIONS

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I will introduce a basis of the symmetric functions that are the irreducible characters of the symmetric group realized as permutation matrices. Just as the Schur functions are the irreducible characters of the general linear group, the elements of this new basis are functions in the eigenvalues of a permutation matrix.

Symbolically, if Ξ_μ are the eigenvalues of a permutation matrix of cycle type μ , then $\tilde{s}_\lambda[\Xi_\mu]$ will be the irreducible symmetric group character $\chi^{(|\mu|-|\lambda|,\lambda)}(\mu)$.

This basis has (outer) product structure coefficients given by the reduced Kronecker coefficients and it also has positive coproduct structure coefficients. There is analogously a second basis of the induced trivial characters of the symmetric group and together these bases encode the combinatorics of multisets and multiset valued tableaux.

Joint work with Rosa Orellana (Dartmouth College).