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*An analytic approach to computing Kronecker coefficients*

Kronecker coefficients appear as structure constants for the decomposition into irreducibles of the tensor product of representations of the symmetric group. Since the 1938 article 'The Analysis of the Kronecker Product of Irreducible Representations of the Symmetric Group' written by Murnaghan, there has been an active interest in finding a combinatorial interpretation of the Kronecker coefficients. Unlike the closely related Littlewood-Richardson coefficients, which count points in polytopes, the Kronecker coefficients have no known combinatorial interpretation, and cannot be feasibly computed with existing methods. It is even unkown when they are non-zero.

This work builds upon advances made by Baldoni, Vergne, and Walter (2016) who showed that, for fixed parameter sizes, the Kronecker coefficients are piecewise quasi-polynomials. They also provided theoretical computation methods, which are unfortunately too complex to be implemented in practice. More recently, Mishna, Rosas and Sundaram have found a way to reduce the complexity by linking the coefficients more directly to the number of integer points in specific polyhedra. This interpretation opens the door towards a complex analytic approach. We utilise techniques from the relatively new field of multivariate analytic combinatorics (described in 'Analytic Combinatorics in Several Variables' by Pemantle and Wilson, 2013) in order to determine asymptotic formulas for the Kronecker coefficients. Such formulas yield important information about the coefficients, notably, determining where the Kronecker coefficients are 0.