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# Symmetric matrices, Catalan paths, and correlations

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## Abstract

Kenyon and Pemantle (2014) gave a formula for the entries of a square matrix in terms of connected principal and almost-principal minors. Each entry is an explicit Laurent polynomial whose terms are the weights of domino tilings of a half Aztec diamond. They conjectured an analogue of this parametrization for symmetric matrices, where the Laurent monomials are indexed by Catalan paths. In this paper we prove the Kenyon-Pemantle conjecture, and apply this to a statistics problem pioneered by Joe (2006). Correlation matrices are represented by an explicit bijection from the cube to the ellipsope.

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