On the Coefficients of the Max-Algebraic Characteristic Polynomial and Equation.

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Abstract: No polynomial algorithms are known for finding the coefficients of the characteristic polynomial and characteristic equation of a matrix in max-algebra. The following are proved: (1) The task of finding the max-algebraic characteristic polynomial for permutation matrices encoded using the lengths of their constituent cycles is NP-complete. (2) The task of finding the lowest order finite term of the max-algebraic characteristic polynomial for a $\{0, -\infty\}$ matrix can be converted to the assignment problem. (3) The task of finding the max-algebraic characteristic equation of a $\{0, -\infty\}$ matrix can be converted to that of finding the conventional characteristic equation for a $\{0, 1\}$ matrix and thus it is solvable in polynomial time.