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ON NONNEGATIVE MATRICES WITH GIVEN ROW AND COLUMN SUMS*

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Abstract. Let $\mathbf{A}$ be a nonnegative $n \times n$ matrix with row sums $r_1, \ldots, r_n$ and column sums $c_1, \ldots, c_n$. Order them decreasingly: $r_1^{\downarrow} \geq \ldots \geq r_n^{\downarrow}$ and $c_1^{\downarrow} \geq \ldots \geq c_n^{\downarrow}$. The conjectures $\operatorname{su} \mathbf{A}^m \leq (r_1 c_1)^{\frac{m}{2}} + \cdots + (r_n c_n)^{\frac{m}{2}}$ and $\operatorname{su} \mathbf{A}^m \leq (r_1^{\downarrow} c_1^{\downarrow})^{\frac{m}{2}} + \cdots + (r_n^{\downarrow} c_n^{\downarrow})^{\frac{m}{2}}$ are considered, where $\operatorname{su} \mathbf{B}$ denotes the sum of the entries of a matrix $\mathbf{B}$ and m is a nonnegative integer.

Key words. Nonnegative matrix, Row sum, Column sum, Entry sum, Matrix power.

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