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Integral matrices with given row and column sums. (English)

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Let P and Q be $m \times n$ integral matrices and let R and S be integral vectors. For a wide variety of sets (P, Q, R, S) the author obtains two necessary and sufficient conditions for there to exist an $m \times n$ integral matrix A with row and column sum vectors R and S and such that $P \leq A \leq Q$; these results unify earlier results on $(0, 1)$ -matrices. Certain results involving decomposability or invariant elements are also derived, among other things.

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Keywords : integral matrices; row and column sum; decomposability

Classification :

*05B20 $(0,1)$ -matrices (combinatorics)

05C50 Graphs and matrices

05C20 Directed graphs (digraphs)

05C40 Connectivity

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