Electronic Journal of Linear Algebra ISSN 1081-3810
A publication of the International Linear Algebra Society
Volume 12, pp. 6-16, December 2004

ELA
http://math.technion.ac.il/iic/ela

A BRUHAT ORDER FOR THE CLASS OF $(0,1)$-MATRICES WITH ROW SUM VECTOR R AND COLUMN SUM VECTOR S*

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Abstract. Generalizing the Bruhat order for permutations (so for permutation matrices), a Bruhat order is defined for the class of m by n $(0,1)$-matrices with a given row and column sum vector. An algorithm is given for constructing a minimal matrix (with respect to the Bruhat order) in such a class. This algorithm simplifies in the case that the row and column sums are all equal to a constant k. When $k = 2$ or $k = 3$, all minimal matrices are determined. Examples are presented that suggest such a determination might be very difficult for $k \geq 4$.

Key words. Bruhat order, Row sum and column sum vectors, Interchanges, Minimal matrix.

AMS subject classifications. 05B20, 06A07, 15A36.

*Received by the editors 7 October 2004. Accepted for publication 2 December 2004. Handling Editor: Abraham Berman.

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