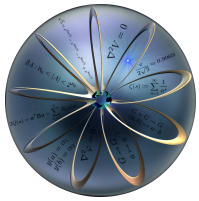

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König-Egervary theorem

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The *König-Egervary theorem* states that in a finite matrix of 0's and 1's, the maximum numbers of 1's such that no two are in a line, equals the minimum number of lines which collectively contain all the 1's. Here line means row or column.

Take this matrix, for example,

$$\begin{bmatrix} 1 & 0 & 0 & 0 & 0 & 1 \\ 1 & 0 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 & 0 & 1 \\ 1 & 0 & 1 & 1 & 1 & 0 \end{bmatrix}$$

Here the max and min numbers (always equal) are 4.

References

[1] A. Chandra Babu, P. V. Ramakrishnan, "New Proofs of Konig-Egervary Theorem And Maximal Flow-Minimal Cut Capacity Theorem Using O. R. Techniques" *Indian J. Pure Appl. Math.* **22**(11) (1991): 905 - 911