A new elemental proof of Kőnig's Theorem

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The well-known Kőnig's Theorem states that in a bipartite graph G, the number of edges in a maximum matching is equal to the number of vertices in a minimum vertex cover, i.e., $\mu(G) = \tau_0(G)$, see [1] and [2]. From this result, it is easy to deduce that if e is an edge of G connecting two vertices in a minimum vertex cover, then G and $G-e$ have the same number of vertices in a minimum vertex cover, i.e., $\tau_0(G) = \tau_0(G-e)$. We present an elementary proof of this property without using Kőnig's Theorem. Then we give a proof of Kőnig's Theorem using this property. We also give an edge version of the property.

Trabajo en conjunto con Daniel A. Jaume (Universidad Nacional de San Luis - IMASL - CONICET).

Referencias

[1] Kőnig, Dénes. "Graphs and matrices."Matematikai és Fizikai Lapok 38 (1931): 116-119.

[2] Reichmeider, Philip Francis. The Equivalence of Some Combinatorial Matching Theorems. Adelphi University, 1978.