ON SELKOW'S BOUND ON THE INDEPENDENCE NUMBER OF GRAPHS

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Abstract

For a graph G with vertex set $V(G)$ and independence number $\alpha(G)$, Selkow [*A Probabilistic lower bound on the independence number of graphs*, Discrete Math. 132 (1994) 363–365] established the famous lower bound $\sum_{v \in V(G)} \frac{1}{d(v)+1} \left(1 + \max \left\{ \frac{d(v)}{d(v)+1} - \sum_{u \in N(v)} \frac{1}{d(u)+1}, 0 \right\} \right)$ on $\alpha(G)$, where $N(v)$ and $d(v) = |N(v)|$ denote the neighborhood and the degree of a vertex $v \in V(G)$, respectively. However, Selkow's original proof of this result is incorrect. We give a new probabilistic proof of Selkow's bound here.

Keywords: graph, independence number.

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