

Probabilistic Upper Bound on the Domination Number

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Given a graph G with vertex set V , a set $S \subseteq V$ of vertices in G is a dominating set if for every vertex $v \in V \setminus S$, there exists a vertex $u \in S$ such that v is adjacent to u . The domination number $\gamma(G)$ of G is the cardinality of a minimum dominating set of G . Since the problem of determining the domination number is known to be NP-complete for an arbitrary graph, it is natural to find bounds on the domination number. In this talk, a probabilistic upper bound on $\gamma(G)$ of a graph G with n vertices, minimum degree δ , and maximum degree Δ is proved. The derived bound is a modification of the well-known upper bound (Alon and Spencer, 1992) and indicates a new relationship between the domination number and independence number.

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