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Graph Algorithms with Hostile Partners

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Abstract

A short description of the project goes here.

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Introduction

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Dominating sets

We begin by listing some definitions.

Definition. The Dominating set, D, of a graph $G = (E, V)$ is any subset of V such that every vertex in V is adjacent to at least one vertex in D.

Definition. The Dominating number, $\gamma(G)$, of a graph $G = (E, V)$ is the size of the smallest dominating set of G.

Definition. Independent set, maximum independent set, independence number $\alpha(G)$

2.1 min size dominating set

Lemma 2.1. Let G be a graph.

$$\gamma(G) \geq \alpha(G)$$

Proof. Let X be a minimum dominating set in some graph $G = (V, E)$. By definition of dominating set vertex in V is adjacent to at least one vertex in

$\square$

Recall that $\chi(G)$ is the chromatic number of the graph G.

Theorem 2.2 (Willis 2011 Theorem 3.1). For any graph $G = (V, E)$ [1]

$$\alpha(G) \leq \frac{|V|}{\chi(G)}$$

Theorem 2.3. Let G be a graph, such that the number of vertices in G, n, is ≥ 4. Then for any G,

$$\gamma_g(G) \geq \left\lceil \frac{n}{2} \right\rceil$$

Proof. asd $\square$

Bibliography

[1] Willis, W. Bounds for the independence number of a graph.