Upper bound for Maker–Breaker domination number

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We consider a game that is played by two players on a given graph. One is called Dominator, the other called Staller; they take turns to claim a vertex of the graph that no one has claimed yet in the game. Dominator wins if at some point he has claimed a domination set of the graph; Staller wins if she can prevent Dominator from winning.

We see that when a graph is given, whether or not Dominator has a winning strategy is invariant, as well as the minimum number of steps Dominator needs to guarantee his winning in case he has a winning strategy. We denote this number by $\Gamma_{MB}(G)$ for graph G, for the game where Dominator is the first player. If Dominator has no winning strategy, we say $\gamma_{MB}(G) = \infty$; otherwise, $\gamma_{MB}(G) < \infty$.

Consider the situation when graph G has odd number of vertices and Dominator has a winning strategy, trivially we have $\gamma_{MB}(G) \leq \frac{|V(G)|+1}{2}$.

Conjecture 0.1. *Let G be a connected graph with odd number of vertices such that $\gamma_{MB}(G) < \infty$. Then $\gamma_{MB}(G) \leq \frac{|V(G)|-1}{2}$*

For more details see [1, Section 7, Item 1].

References

[1] Valentin Gledel, Vesna Iršič, Sandi Klavžar Maker-Breaker domination number. preprint: arXiv:1810.04397v2.