

Domination Game on Graphs

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In this talk we present a domination game on finite graphs that was recently introduced by Brešar, Klavžar and Rall, Domination game and an imagination strategy, *SIAM J. Discrete Math.*, Vol 24, No. 3, 979–991 (2010). Two players, Dominator and Staller, alternate choosing a vertex from a graph G . Each vertex chosen by a player must dominate at least one new vertex that was not dominated by the set of vertices chosen prior to that in the game. Both players use an optimal strategy—Dominator to end the game as quickly as possible and Staller to prolong the game. Dominator starts Game 1, and the resulting number of vertices chosen when Game 1 ends is the *game domination number* of G , denoted $\gamma_g(G)$. When Staller has the first move on G (Game 2) the corresponding invariant is the *Staller-start game domination number*, $\gamma'_g(G)$.

We present most of what is known about this game and these two invariants including some known and conjectured bounds. In particular, even though the domination game is closely related to ordinary domination in some respects, we present some rather surprising results about the domination game on trees and spanning subgraphs. We also discuss the principal proof technique, the imagination strategy, and give a number of conjectures and open problems.