$k$-dependence and $\frac{1}{2}$-domination in kings graphs

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April 9, 2006

Abstract

Given an integer $k$, what is the maximum number of kings that can be placed on an $n$ by $n$ board (usually a toroidal board for us), no king adjacent to more than $k$ kings? In graph theoretic terms this is the same as asking for the $k$-dependence number of the $n$ by $n$ kings graph. The cases $k = 4, 5$ are the most interesting ones. We allow the board to be $n$ by $n$ by ... by $n$ with arbitrarily many dimensions. Linear programming and balanced ternary notation come into play. This is joint work with Eugen Ionascu.