
MOHSEN MOLLAHAJIAGHAEI, University of Western Ontario
Independent and domination number of simplicial rook graphs

Let $\mathbb{N}_0 = \mathbb{N} \cup \{0\}$. The simplicial rook graph, denoted by $SR(m, n)$ is the graph of which the vertices are the vectors in \mathbb{N}_0^m summing to n , where two vectors are adjacent when they differ in precisely two coordinates. The independent number of $SR(m, n)$ is the maximum number of non-attacking rooks on a simplicial-chessboard. We give a partial solution for this number. Also, we provide lower and upper bounds for $\alpha(SR(m, n))$.

The domination number of this graph is the smallest number of rooks that can dominate a simplicial-chessboard. We prove that $\gamma(SR(3, n)) = \lfloor n/2 \rfloor + 1$. In general, we show that $\gamma(SR(m, n)) = \theta(n^{m-2})$.

(Joint work with Arash-Ahadi)