

Minimum rank of graphs with loops

Chassidy Bozeman*, AnnaVictoria Ellsworth, Leslie Hogben, Jephian Chin-Hung Lin, Gabi Maurer, Kathleen Nowak, Aaron Rodriguez, and James Strickland, Iowa State University

A loop graph \mathfrak{G} is a finite undirected graph that allows loops but does not allow multiple edges. The set $\mathcal{S}(\mathfrak{G})$ of real symmetric matrices associated with a loop graph \mathfrak{G} of order n is the set of symmetric matrices $A = [a_{ij}] \in \mathbb{R}^{n \times n}$ such that $a_{ij} \neq 0$ if and only if $ij \in E(\mathfrak{G})$. The minimum rank of a loop graph \mathfrak{G} is the minimum of the ranks of the matrices in $\mathcal{S}(\mathfrak{G})$. We characterize loop graphs have minimum rank equal to the order of the graph.

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