

Fault-tolerant identifying codes

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A detection system, modeled in a graph, is composed of “detectors” positioned at a subset of vertices in order to uniquely locate an “intruder” at any vertex. Identifying codes is a detection system that uses detectors that can sense the presence or absence of an intruder within distance one. We introduce fault-tolerant identifying codes with various functionalities and show that the problem of determining the lowest cardinality of fault-tolerant identifying codes for an arbitrary graph is NP-complete. We also determine the bounds on the lowest cardinality for some special classes of graphs.

KEYWORDS: domination, detection system, identifying-code, fault-tolerant, redundant-identifying-code, density.