

Graph-referential list colorings of graphs

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Some years ago Steve Hedetniemi asked: For which graphs does the family of open neighborhoods of its vertices have a system of distinct representatives? An easily proved and fairly satisfying answer was found: G is such a graph iff G has a spanning subgraph whose components are either cycles or single edges.

Such a system of distinct representatives is a (proper) list coloring of the complete graph on $V(G)$ when, for each vertex v , the list assigned to v is the open neighborhood of v in G . Let us generalize the situation: For graphs G, H on the same vertex set, a (proper) *G -referential coloring of H* is a (proper) list coloring of H , with the lists provided to the vertices being the open neighbor sets of the vertices in G . We could also call such a coloring a *system of H -distinct representatives* of the open neighbor sets of the vertices in G . When $G = H$ we will call such a coloring a (proper) self-coloring of G .

As usual, there will be some easy results given on this matter, and some difficult questions posed, if we haven't disposed of them before the conference.