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Edge-distinguishing of star-free graphs

The distinguishing index $D'(G)$ of a graph G is the least integer d such that G has an edge colouring with d colours which is only preserved by the trivial automorphism. Kalinowski and Pilśniak proved that for a connected graph with at least three vertices the distinguishing index is at most the maximum degree of G, with the exception of the cycles C_3, C_4 and C_5. Additionally, they proved that this is an optimal general upper bound. The subsequent research was focused on finding upper bounds for specific classes of graphs.

In the presentation we give an overview of known results for some classes of graphs. We focus mainly on graphs which do not contain a star $K_{1,s}$ as an induced subgraph, for $s \geq 3$. We call such graphs *$K_{1,s}$-free graphs*. In particular, $K_{1,3}$-free graphs are called *claw-free graphs*. Pilśniak proved that a connected, claw-free graph has the distinguishing index at most three. She also conjectured that this bound could be improved for graphs of sufficiently large order. We show that the distinguishing index of a connected, claw-free graph with at least six vertices is bounded from above by two. We also prove that if G is a connected, $K_{1,s}$-free graph of order at least six, then $D'(G) \leq s - 1$.

This is joint work with Ernest Kargul, Szymon Musiał, and Katarzyna Pal.

References

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