

On proper orientations of graphs

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For a simple undirected graph G , an orientation D of G is an assignment of a direction to each edge of G . The indegree of a vertex v in D is the number of edges oriented towards v . An orientation D is proper if, for any adjacent vertices u and v in G , the indegree of u is different from the indegree of v in such orientation. Let $\Delta(D)$ denote the maximum indegree of a vertex in an orientation D of a graph G . The proper orientation number of a simple graph G is the minimum value of $\Delta(D)$, among all proper orientations D of G .

In this talk, we will summarize the results and open questions in the literature concerning the proper orientation number of graphs and detail some recent results we obtained with C. Linhares, I. Sau and A. Silva on the weighted version of the problem restricted to graphs with bounded treewidth.