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EQUITABLE 1-2(-3) CONJECTURE

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Introduced in 2004 by Michał Karoński, Tomasz Łuczak et Andrew Thomason, the 1-2-3 conjecture states that every K_2-free graph admits an edge weighting with weights $1, 2, 3$, such that the sum on each vertex of the incident weights, yields a proper colouring. In 2010, Jakub Przybyło et Mariusz Woźniak conjectured that if we allow weights on the vertices too, the colours we can have such weighting with only weights 1 and 2. We will present a new variant of these colourings where we require that each weight must be used the same number of times (up to a difference of 1). In particular we present results recently obtained on forests, bipartite and complete graphs, and propose interesting related open problems.

A *star edge coloring* of a graph G is a proper edge coloring such that every 2-colored connected subgraph of G is a path of length at most 3. For a graph G, let the *list star chromatic index* of G, $ch'_s(G)$, be the minimum k such that for any k-uniform list assignment L for the set of edges, G has a star edge coloring from L.

Dvořák, Mohar and Šámal [1] asked whether the list star chromatic index of every subcubic graph is at most 7. We will give a partial answer to this question in this talk by proving that it is at most 8. We will also give some bounds for the list star chromatic index of sparse graphs.

Literatura

[1] Z. Dvořák, B. Mohar, and R. Šámal. Star chromatic index, J Graph Theory 72(2013), 313–326.