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ON-LINE MAJORITY EDGE-COLOURINGS OF GRAPHS

A *majority edge-colouring* of a graph G is a colouring of the edges of G such that for each vertex v of G , at most half the edges incident with v have the same colour. This notion was introduced in 2023 by Bock, Kalinowski, Pardey, Piłśniak, Rautenbach and Woźniak who proved that every graph of minimum degree at least 2 has a majority 4-edge-colouring.

We investigate an *on-line* variant of this problem in which a graph is revealed edge-by-edge (or vertex-by-vertex) and an algorithm assigns colours to edges immediately after they are revealed. In particular, we show that the greedy colouring algorithm, which uses at most 5 colours, is optimal among on-line algorithms. In addition, we consider generalization of this problem to *on-line $1/k$ -majority edge-colourings*.