A Thue-type colouring problem

Erika Škrabuľáková

A sequence $r_1, r_2, \ldots, r_{2n}$ such that $r_i = r_{n+i}$ for all $1 \leq i \leq n$, is called a *repetition*. A sequence S is called *non-repetitive* if no subsequence of consecutive terms of S is a repetition.

In 1906 the Norwegian mathematician Axel Thue started the systematic study of word structure. In his seminal paper he showed that there are arbitrarily long non-repetitive sequences over three symbols. Since then Thue's non-repetitive sequences have repetitively occurred also in mathematics and various questions concerning non-repetitive colourings of graphs have been formulated.

Alon et al. introduced a natural generalization of Thue's sequences for colouring of graphs. An edge-colouring / vertex-colouring φ of a graph G is *non-repetitive* if the sequence of colours on any path in G is non-repetitive. There are several ways how to relax the requirements in this problem and hence several kinds of so called Thue's types of problems dealing with non-repetitive colourings. Here you come familiar with one of them.