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Transversals of sequences

Given an n-set M and a positive integer $k \leq n$, as a k-$sequence$ of elements of M we will understand an injective function $G : \{1, \ldots, k\} \to M$. A k-sequence G will be also denoted as $(x_1, \ldots, x_k)$, with $G(i) = x_i$ for each $i = 1 \ldots, k$. A set T of k-sequences of M will be called an (n, k)-$transversal$ if for each n-sequence $S = (x_1, \ldots, x_n)$ of elements of M, there is $(y_1, \ldots, y_k) \in T$ such that $(y_1, \ldots, y_k)$ is a subsequence of S. An instance of this notion of transversal can be deduce from a result of Erdös and Szekeres which states that every sequence of n integers contains a crescent or decrescent subsequence of order k (for $k \leq \lceil \sqrt{n} \rceil$). Given an n-set M and a digraph $D = (V, A)$, with vertex-set $M = V$, the set of transitive tournaments of order k of D define, in a "natural way", a set of k-sequences of M (each of those transitive tournaments of D can define two sequences of k elements of M). In this talk we present some (n, k)-transversals which arise from the set of transitive tournaments of digraphs, some of them closely related with the diagonal Ramsey numbers.