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## Perfect sequences

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## Abstract

Let k and n be positive integers. A (k, n)-perfect sequence is a cyclical sequence containing every possible n-ary k-tuple exactly once. It is known [1] that there exist perfect sequences for any k and n.

András Benczúr in 1983 posed the problem of existence of **superperfect** sequences whose  $n^i$  length prefixes are (i, n)-perfect for i = 1, 2, ... The solution is based on the following property of perfect sequences [2]: if  $k \ge 1$ and  $n \ne 2$ , then any (k, n)-perfect sequence is a prefix of some (k + 1, n)perfect sequence.

In the talk we investigate different infinite extensions of the concept of perfectness (alphabet size grows, window size is growing in one or more directions, number of dimensions is growing). Among others we prove the following new property of perfect sequences: if k and n are positive integers, then any (k, n)-perfect sequence is a prefix of a (k, n + 1)-perfect sequence.

Perfect matrices have applications in position location, cryptography, picture processing [3].

The manuscript of the paper can be found at

http://people.inf.elte.hu/tony/publications/Perfseq.pdf.

## References

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