

Multi-alphabetic hypercubes

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Abstract

These hypercubes generalize the well-known Graeco-Latin squares. In one dimension m hypercube we have p^m “points” with m coordinates taking the values $0, 1, \dots, p - 1$. In each point we locate letters from m distinct alphabets. When we vary one of the coordinates, we get all the letters of each of the alphabets. We show, how to use vector spaces over Galois Fields to obtain such hypercubes. Moreover, these hypercubes will constitute families of pairwise orthogonal ones. This opens interesting possibilities in randomized systematic sampling for continuous media.

Keywords

Graeco-Latin squares, Hypercubes, Multi-alphabetic hypercubes

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