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## Exploring connections between multivariate Bernoulli distributions and discrete copulas

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Multivariate Bernoulli distributions are classical statistical models used in many applied fields such as clinical trials, social sciences, and finance. The class of  $d$ -dimensional Bernoulli distributions, with given Bernoulli univariate marginal distributions, admits a representation as a convex polytope. For exchangeable multivariate Bernoulli distributions with given margins, an analytical expression of the extreme points of the polytope has recently been determined.

Discrete copulas are statistical tools to represent the joint distribution of discrete random vectors. They are fascinating mathematical objects that also admit a representation as a convex polytope. Studying polytopes of discrete copulas and their extreme points has recently gained attention in the literature.

In this work, we explore potential connections between multivariate Bernoulli distributions and discrete copulas. Our goal is to identify results to transfer from one class to the other one by exploiting their geometric representation as convex polytopes. We discuss possible ways to attack the problem and describe some numerical examples.

### Keywords

multivariate Bernoulli distributions; discrete copulas; convex polytopes

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