

# Markov bases and subbases for bounded contingency tables

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**Abstract** In this paper we study the computation of Markov bases for contingency tables whose cell entries have an upper bound. It is known that in this case one has to compute universal Gröbner bases, and this is often infeasible also in small- and medium-sized problems. Here we focus on bounded two-way contingency tables under independence model. We show that when these bounds on cells are positive the set of basic moves of all  $2 \times 2$  minors connects all tables with given margins. We also give some results about bounded incomplete table and we conclude with an open problem on the necessary and sufficient condition on the set of structural zeros so that the set of basic moves of all  $2 \times 2$  minors connects all incomplete contingency tables with given positive margins.

**Keywords** Structural zeros · Markov basis · Universal Gröbner basis