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The mode is a measure of the central tendency as well as the most probable value. Additionally, the mode is not influenced by the tail of the distribution. In the literature the properties and the application of mode estimation is only considered under simple random sampling (SRS). However, ranked set sampling (RSS) is a structural sampling method which improves the efficiency of parameter estimation in many circumstances and typically leads to a reduction in sample size. In this paper we investigate some of the asymptotic properties of kernel density based mode estimation using RSS. We demonstrate that kernel density based mode estimation using RSS is consistent and asymptotically normal with smaller variance than that under SRS.

Improved performance of the mode estimation using RSS compared to SRS is supported through a simulation study. An illustration of the computational aspect using a Duchenne muscular dystrophy data set is provided.

“Notes on kernel density based mode estimation using more efficient sampling designs,” was recently published in Computational Statistics.

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