

Answering the question about the number of modes with **multimode**

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ABSTRACT

Determining the number of different groups in a given population is an important issue in many applied fields. This problem can be translated in the question about the number of modes (local maxima in a real density function). The objective of this talk is showing how the **multimode** package, for the statistical software R, can be used for testing and exploring the number of modes. Different testing methods for determining the number of modes are implemented in this package, such as the critical bandwidth and the excess mass. The **multimode** package also includes a function providing the different proposals available in the literature for testing if the number of modes of a sample is equal to a given number (against if it is greater). In addition, once the number of modes is known, this package includes a function for estimating the location of modes and antimodes (local minima) and their density values. Different graphical methods for analysing, in an exploratory way, the number and location of modes are also provided in **multimode**. The tools available in this package will be illustrated in some examples from applied fields.

Key phrases and keywords: exploratory tools, multimodality, nonparametric estimation, testing procedure.