Nonparametric Tests for the mean of a Non-negative Population

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Abstract

We construct level-α tests for testing the null hypothesis that the mean of a non-negative population falls below a prespecified nominal value. These tests make no assumption about the distribution function other than that it be supported on $[0, \infty)$. Simple tests are derived based on either the sample mean or the sample product. The nonparametric likelihood ratio test is also discussed in this context. We also derive the uniformly most powerful monotone (UMP) tests for a sample of size no larger than 2.

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Keywords: Level-α test; Markov's inequality; Non-negative random variable; Nonparametric likelihood ratio test; UMP test.