

Algorithms for Determination of Sample Sizes for Bayesian Estimations in Single-server Markovian Queues *

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Abstract

Although the single-server Markovian queues are one of the simplest models in Queue Theory, they have important practical applications and one of the initial steps for its application includes the determination of the necessary sample sizes for an interval estimation of its parameters, including the traffic intensity, defined as the ratio between the arrival rate and the service rate. In this article, we develop Bayesian algorithms to determine the size of samples that must be collected to guarantee a pre-specified mean amplitude or mean coverage for the traffic intensity. These samples are composed of the number of arrivals during service times, a practical way to collect data. Monte Carlo simulations attest to the efficiency and effectiveness of the algorithms proposed.

Keywords: Sample size; Markovian queues; Bayesian inference; credible region.

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