

# Inference in a Single Server Markovian Queue with Fixed Service Time

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**Abstract**—This paper is concerned with the problem of estimating the un-known parameter traffic intensity ( $\rho$ ) and consequently the expected number of customers in the system ( $L$ ), and the average queue size ( $L_q$ ) for infinite single-serve queue with Poisson arrivals and fixed service time, in Kendall notation,  $M/D/1$  queue based on information on number of arrivals during the service time of customers. Bayes estimators of  $\rho$ ,  $L$  and  $L_q$  are derived under squared error loss function assuming two forms of prior information on  $\rho$ . The performance of the proposed Bayes estimators is compared with that of the corresponding classical version estimator based on maximum likelihood principle. The model comparison criterion based on Bayes factor is used to select a suitable prior for Bayesian analysis. A simulation study is performed to illustrate the proposed procedures numerically.