A Truncation in the Overflow Model

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Abstract

Queuing theory and the development of telecommunication systems have a strong link. The first queuing theoretic models were developed by A. K. Erlang for the modeling of telephone systems. After this many researches was devoted to the analysis of queuing systems and their applications. The determination of the steady state for all possible states of the system is the basis for evaluate the performance of this system. But sometimes the direct and exact solution of stationary probabilities is not always obvious like networks which have not form product.

In this work, we applied a truncation method on the overflow model and we obtained the error bounds using the strong stability method and make a comparative study with numerical results. The overflow model is a network with two service stations: the primary station consists of a single server without queue. A customer who arrives and finds the server free is immediately served; else, it is directed to the secondary station formed as a single server. If the latter is free, the customer is supported; else, it takes place in an infinite queue.

Keywords
Overflow queueing system, Markov chain, Truncation, Strong stability, Application.