

## On M/G/1 Queue With Single And Batch Services

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### Abstract

A variant of the standard M/G/1 queue with single and batch services is considered here. Customers arrive at the service station according to a Poisson process. At the end of each service, if the server finds less than or equal to  $\lceil$  (fixed) customers waiting he serves them one at a time according to FCFS rule, with service time of each having a general distribution independent of the system size and if there are more than  $\lceil$  customers he serves them all together in batch according to a general service time distribution which is independent of the batch size. The transient distribution of the number of customers in the system and its limiting distribution are obtained using the theory of Markov renewal process.

*Keywords:* M/G/1 Queue, Markov renewal process, Transient distribution, Limiting distribution.