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A nonpreemptive priority $MAP/G/1$ queue with two classes of customers. (English)

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Summary: This paper considers a nonpreemptive priority queue with two classes of customers. Customers in each priority class arrive to the system according to a Markovian arrival process (MAP). Since the MAP is weakly dense in the class of stationary point processes, it is a fairly general arrival process. The service times of customers in each priority class are independent and identically distributed according to a general distribution function which may differ among two priority classes. Using both the generating function technique and the matrix analytic method, we derive various formulas for the queue length and waiting time distributions. We also discuss the algorithmic implementation of the analytical results along with numerical examples.

MSC:

90B22 Queues and service in operations research
60K25 Queueing theory (aspects of probability theory)

Keywords:

nonpreemptive priority queue; two classes of customers; queue length; waiting time distributions

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