Batch arrival retrial queue with positive and negative customers is considered. Server provides M types of service. Positive customers arrive in batches according to Poisson process. If the server is idle upon the arrival of a batch, one of the customers in the batch receives any one the types immediately and others join the orbit. The server is subject to two different modes of failure. Mode 1 failure occurs due to the arrival of negative customer and Mode 2 due to random breakdown of the server. In both cases, repair starts after some random amount of time. The server failed under mode 2 continues the interrupted service or waits for the same customer after the repair completion. Generating function technique is employed to obtain joint distributions of the server state and orbit length. Expected system size, expected orbit size, availability of the server and failure frequency of the server are derived. Stochastic decomposition law is also verified.

Index Terms
Computer Science
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Keywords
Retrial queue - negative customers - multi-types of heterogeneous service - setup time - reserved time.