OPTIMAL ORDER FOR TWO SERVERS IN TANDEM

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Abstract. We consider two servers (server i, $i = 1, 2$) in tandem for which the order of servers can be changed. Server 1 has a general service time distribution and server 2 has either its 'shifted' or 'truncated' distribution. This permits that the service times at the two servers are overlapping. An unlimited queue is allowed in front of the first server. For the systems having zero buffer capacity between the servers, we show that the sojourn time of every customer is stochastically minimized under any arrival process if server 2 is first. For the systems with infinite buffer capacity and a Poisson arrivals , we show that this order of servers minimizes mean customer delay when traffic is light. Several numerical examples are presented to demonstrate that this optimal order is invariant under any arrival process (the interarrival times are i.i.d. r.v.'s) and mild traffic condition.

Key words and phrases: Tandem queue, optimal order, stochastic ordering, light traffic.