Accepted Manuscript

The waiting time distribution for a correlated queue with exponential interarrival and service times

Bara Kim, Jeongsim Kim

PII: S0167-6377(17)30609-0
DOI: https://doi.org/10.1016/j.orl.2018.02.001
Reference: OPERES 6337

To appear in: *Operations Research Letters*

Received date : 7 November 2017
Revised date : 25 January 2018
Accepted date : 6 February 2018

Please cite this article as: B. Kim, J. Kim, The waiting time distribution for a correlated queue with exponential interarrival and service times, *Operations Research Letters* (2018), https://doi.org/10.1016/j.orl.2018.02.001

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

ACCEPTED MANUSCRIPT

The waiting time distribution for a correlated queue with exponential interarrival and service times

Bara Kim*, Jeongsim Kim** [1]

*Department of Mathematics, Korea University

145 Anam-ro, Seongbuk-gu, Seoul, 02841, Korea

e-mail: bara@korea.ac.kr

**Department of Mathematics Education, Chungbuk National University

1 Chungdae-ro, Seowon-gu, Cheongju, Chungbuk, 28644, Korea

e-mail: jeongsimkim@chungbuk.ac.kr

Abstract

We are concerned with the analysis of the waiting time distribution in an $M/M/1$ queue in which the interarrival time between the nth and the $(n+1)$th customers and the service time of the nth customer are correlated random variables with Downton's bivariate exponential distribution. In this paper we show that the conditional waiting time distribution, given that the waiting time is positive, is exponential.

Keywords Correlated queue, Bivariate exponential distribution, Workload

1 Introduction

In $M/M/1$ queues it is usually assumed that the interarrival time between two consecutive customers is independent of their service times. However, this assumption does not consider flexibility, where the server may speed up or slow down depending on the demand.

[1]Corresponding author. Jeongsim Kim, E-mail: jeongsimkim@chungbuk.ac.kr

Download English Version:

https://daneshyari.com/en/article/7543896

Download Persian Version:

https://daneshyari.com/article/7543896

Daneshyari.com