University of Maryland Baltimore County
Department of Information Systems
Fall 2017

IS 709/809: Computational Methods for IS Research
Homework 4
QtsPlus Software Lab

(Handed Out: Nov 20, 2017 (Tuesday), Due: Nov 27, 2017 (Tuesday) Before Class)

Instructions: Please complete this assignment individually. This lab contains one question based on the Queueing Theory models we have discussed in the class and you are asked to provide a series of explanations to test your understanding of the "QtSPlus" software and the Queueing Theory models. To earn credit, you need to answer each question using the QtSPlus software and submit a report containing relevant experiment results. Please notice that screenshots are useful to demonstrate your analysis and conclusions in some of the cases.

1. (60 pts) In QtsPlus read the Example_2_1 Tutor > M/M/1. Rerun the sample program using $\lambda = 5$ and $\mu = 6$ and $\lambda = 3$ and $\mu = 6$. Explain how the results change for these two runs for the following performance measures.

a) Mean number of customers in the system (L)

b) Mean number of customers in the queue (Lq)

c) Mean waiting time (W)

d) Mean waiting time in the queue (Wq)

e) SizeDistribution

f) TimeDistribution

QtsPlus Software Instructions
The QtsPlus software is distributed by John Wiley & Sons, Inc in connection with the book "Fundamentals of Queueing Theory," Fourth Edition, by Donald Gross, John Shortle, James Thompson and Carl Harris. The software is available freely from the Wiley public ftp server at ftp://ftp.wiley.com/public/sci_tech_med/queueing_theory and is based on discussions contained in the chapters of the book.

DOWNLOAD INSTRUCTIONS:
Please go to ftp://ftp.wiley.com/sci_tech_med/queueing_theory/
Download   QtsPlus Version 3   qtsplus-xcel.exe

INSTALLATION INSTRUCTIONS
Double-click on the saved downloaded file from the Windows File Manager or Explorer. Either accept the default directory name in the pop-up window or specify another directory name (Note: The default or user specified directory will be automatically created if it does not exist). Press the "UnZip" button to complete the installation.

STARTING INSTRUCTIONS
Start the Enhanced Version by opening the QtsPlus.xls file found in the directory specified during installation. Choose the model category and select the desired model. Start the model by double-clicking the model entry or highlight the model and press the "Enter" key or "Run Model" button.

About QtsPlus Software: QtsPlus contains models in the following areas:
* Basic probability calculators
* Finite and infinite birth-death process models
* Single server queueing models
* Multiple server queueing models
* Bulk queueing models
* Priority queueing models
* Network queueing models
* Simulation models