

ISyE 4803-REV: Advanced Manufacturing Systems Modeling and Analysis
Instructor: Spyros Reveliotis
Fall 2019

Homework #5

Due Date: 11/25/19

Reading Assignment

- Your notes from the class lectures.
- Sections 5.3 and 5.4 of your textbook.
- Batching related issues are covered in your book in Chapter 7. The material that was presented in class on batching was not taken from this chapter, but it relates to the preamble and Sections 7.1. 7.1.1, 7.1.2, 7.3 and 7.3.1 of Chapter 7. The presented material was adapted from an inset appearing in the textbook on Factory Physics by Hopp and Spearman, and it is summarized in the corresponding slides that are included in the set of slides on G/G/m queues that is posted on the course website.

Problem set:

- A.** Solve problems 5.5, 5.9, 5.13, 5.15, 5.18 and 5.19 at the end of Chapter 5 of your textbook.

Remark: The six problems in the above list are organized into pairs, with each pair addressing one of the following three network structures: (i) a sequential / linear flow; (ii) an acyclic flow but with more than one paths; and (iii) a more general flow that contains cycles.

- B.** Also, solve Problem 7.4 from the textbook, but instead of doing parts (c) and (d), try to find an optimized batch size that minimizes the expected total cycle time for a part going through the considered station.

Extra Credit (20%)

Read Sections 7.1.1, 7.1.2 and 7.1.3 of your textbook and solve Problem 7.1.