## 1 Instruction 2: Selection of exercises from Chapter 2 of Kulkarni with additional questions + exercises from Handout, Section 1

## Theory: paragraphs 2.5, 2.6

## **Computational Problems:**

- 2.19 See the text in the book.
- 2.20 See the text in the book.
- 2.21 a) Give the set of balance equations and the normalizing equation for the DTMC in Computational Problem 2.20(a).
  - b) Make the task as given in the text of this exercise in the book.
- 2.24 a) Give the set of balance equations and the normalizing equation for the DTMC in Computational Problem 2.20(d).
  - b) Make, without using MAXIM, the task as given in the text of this exercise in the book.
- 2.25 See the text in the book.
- 2.26 See the text in the book.
- 2.33 Consider the single machine production system of Conceptual Problem 2.10. Make the assumptions as given in the text of this exercise.
  - a) Compute the expected number of items processed by the machine in the fifth minute, i.e., the expected number of items finished in that minute.
  - b) Compute the expected number of items processed by the machine in the fifth and sixth minute.
  - c) Make the task as given in the text of this exercise in the book.
- 2.37 a) Explain in Example 2.27 the formula for c(i), the expected revenue per visit to state i (i = 2, 3, 4, 5), and verify the calculated values for c(i).
  - b) Compute the expected revenues in the third week, starting at the beginning of the first week with the maximum stock.
  - c) Make the task as given in the text of this exercise in the book.
- 2.40 a) Suppose the buffer in the data switch in Example 2.12 contains  $i \ (i = 0, 1, \ldots, 7)$  packets at the end of the *n*th time slot. Give the expected number of packets transmitted during the (n + 1)th time slot.
  - b) Suppose the buffer is full at the beginning of the first time slot. Calculate the expected number of packets transmitted during the fifth time slot and during the eighth time slot.
  - c) Suppose the buffer contains 3 packets at the beginning of the first time slot. Compute the expected number of packets transmitted during the first 10 time slots.
  - d) Make the two tasks as given in the text of this exercise in the book.

## Theory: Handout, section 1

Exercises: 2,3,4