

1 Instruction 6: Selection of exercises from Chapters 5 and 6 of Kulkarni

Theory: paragraphs 5.2, 5.3

Conceptual Problems:

- 5.1 See the text in the book.
- 5.7 See the text in the book.

Computational Problems:

- 5.1 See the text in the book.
- 5.2 See the text in the book.
- 5.3 See the text in the book.
- 5.9 See the text in the book.

Theory: paragraphs 6.1, 6.2, 6.3, 6.4

Conceptual Problems:

- 6.8 See the text in the book.
- 6.10 See the text in the book.
- 6.11 See the text in the book.

Computational Problems:

- 6.1 See the text in the book.
- 6.2 See the text in the book.
- 6.6 Consider the barber-shop as described in the text of this exercise. Make the exercise without using MAXIM. Verify your results afterwards with MAXIM.
 - a) Classify the model according to the standard nomenclature described in section 6.1.
 - b) Give the rate diagram for this queueing model.
 - c) Formulate a set of balance and normalizing equations.
 - d) Calculate the limiting distribution.
 - e) What fraction of the customers is lost?
 - f) Compute the fraction of time the barber is occupied.
 - g) Make the task as given in the text of this exercise in the book.
 - h) Determine the expected queueing time.
- 6.7 See the text in the book.
- 6.8 Consider the changed situation in the barber-shop as described in the text of this exercise. Make the exercise without using MAXIM. Verify your results afterwards with MAXIM.

- a) Classify the model according to the standard nomenclature described in section 6.1.
- b) Give the rate diagram for this new model.
- c) Formulate a set of balance and normalizing equations.
- d) Calculate the limiting distribution.
- e) What fraction of the customers is lost?
- f) Compute the fraction of time the barbers are occupied.
- g) Calculate the throughput of the barber-shop, i.e., the expected number of customers served in the barber-shop per hour.
- h) Determine the expected time an entering customer spends in the shop and the expected queueing time of this customer.
- i) Make the task as given in the text of this exercise in the book.