2DD50 - Exercises week 8

Theory: Kulkarni's book, 6.5 and 6.6

Conceptional Problems:

6.20 See the text in the book.

6.21 See the text in the book.

Computational Problems:

6.32 Consider the service system as described in the text of this exercise.

a) Classify the queueing model for this service system according to the standard nomenclature described in paragraph 6.1.

b) Determine the following steady state performance measures:

- The mean number of customers in the service system and the mean waiting time of customers.
- The mean number of occupied servers and the mean service time of a customer.
- The mean number of customers in the queue, waiting for an available server and the mean queueing time of customers.
- The fraction of time the server is occupied.
- The throughput, the expected number of customers that leave the system per hour.

6.33 See the text in the book.

6.35 See the text in the book.

6.36 Consider the queueing system as described in the text of Conceptual Problem 6.20. Use the asumptions and data from this exercise.

a) The servers are considered separately. Each server is modelled as a $G|M|1$ queue. Determine for each server the following steady state performance measures:

- The mean number of customers and the mean waiting time of customers who are assigned to the server.
- The mean number of occupied servers and the mean service time of a customer.
- The mean number of customers in the queue, waiting for an availabl e server and the mean queueing time of customers.
- The fraction of time the server is occupied.
- The throughput, the expected number of customers served by the server per hour.

b) The service system is changed: entering customers form a single queue served "First Come First Served" by the two identical servers. Determine for the changed system the mean number of customers in the system.

c) Answer the question as given in the text of this exercise in the book.

6.40 See the text in the book.