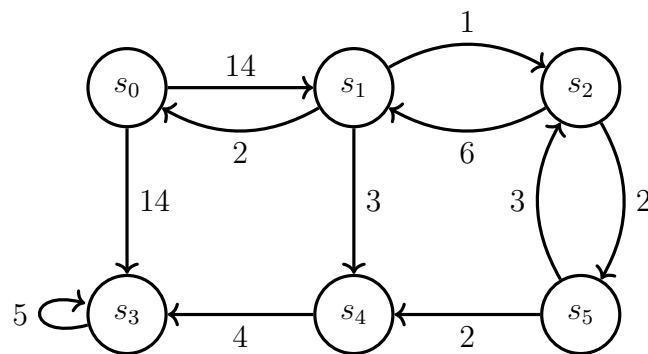# Quantitative Verification – Exercise sheet 12

Exercise 12.1

Draw the embedded DTMC of the following CTMC.

Exercise 12.2

Model the following scenario as a CTMC and uniformize it.

> We consider a printer in a local network. Four printing jobs arrive consecutively with a rate of 2 and are placed in the printer's queue. It has a queue of size two. The jobs are handled with a rate of 1. If the queue overflows, the (buggy) firmware of the printer crashes.

Exercise 12.3

Set $\mathsf{AP} = \{a, b\}$. Model the following specifications as CSL formulae.

- With probability at least 0.5, the system reaches a state where a holds within 5 to 10 time units.

- The probability to reach a state, that in the long run b holds with at least 0.9 probability, is at most 0.2.

- With probability at most 0.1, we have b for the first 100 time steps.