

Exercise sheet 2

Ausgabe: 16.04.2013

Abgabe: 23.04.2013

Exercise 1

Let $(X_n)_{n \in \mathbb{N}}$ be a Markov chain on S and let A be an absorbing set in S . Set

$$T = \inf\{n \geq 0 : X_n \in A\}$$

and

$$h(i) = \mathbb{P}_i(X_n \in A \text{ for some } n \geq 0) = \mathbb{P}_i(T < \infty).$$

Show that $M_n = h(X_n)$ is a martingale.

Exercise 2

Making whatever assumptions you like prove the following:

A process is a Markov for some sequence of kernels \Leftrightarrow Past and future are independent given the present.