

Markov Chains and Their Applications, Problem sheet 9

- (1) Show that the fundamental matrix N is non-negative.
- (2) Compute the fundamental matrix, and answer the basic problems for the absorbing chain provided in the talk as an example.
- (3) Compute the first four moments of the same chain with the general method presented. Compare the first moment with the result of Problem 1.
- (4) Prove the general formula about $N\underline{v}$ being the expected value of the sum of entries on \underline{v} during a walk until absorption.
- (5) Observe that the hypergeometrical distribution is a special absorbing Markov chain with 2 states. Deduce the formula $1/p$ for the expected value as a special case of the expected runtime of an absorbing Markov chain.