

Lecture 4 notes

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Today I began covering Sect. 1.3. Main topics were:

- 1) Definition of *hitting times* (called *first return times* in the text) and closely-related *k*th return times.
- 2) Definition of *recurrent* and *transient* states.
- 3) Main results covered are Lemma 1.3 and Example 1.13.
- 4) Stated Lemma 1.4, Theorem 1.5, and Lemma 1.6.
- 5) Ended with Example 1.14 at the end.

Notes:

- 1) Example 1.14 is relevant for Homework 2, and worth studying more carefully. I'll say more about it on Thursday.
- 2) Lemma 1.6 is part of a more general theorem: suppose x is recurrent and $x \rightarrow y$. Then y is recurrent and $\rho_{xy} = \rho_{yx} = 1$. (Theorem 1.5 can also be seen as a special case of the converse of Lemma 1.6.)