Lecture on July 17th, 2019
Recurrence and Basic Limit Theorem of Markov Chain

1   Recurrence (See 4.3.3)

- Distribution and mean of number of times returns to state i.

- Theorem: a state i is recurrent iff $\sum_{n=1}^{\infty} p_{ii}^{(n)} < \infty$.

- Recurrence is a class property.

- Example: One dimensional random walk on $\mathbb{Z}$. State 0 is recurrent if $p = q = \frac{1}{2}$, otherwise, state 0 is transient.

2   Basic Limit Theorem of Markov Chains (See 4.4)

- State the basic limit theorem of Markov Chain.

- For reducible case, focus on each class.

- Definition of positive recurrent, null recurrent