

Lecture on July 12th, 2018
Regular and Irreducible Markov Chain

1 More on Regular Matrix (See 4.1)

- A sufficient theorem to check a matrix is regular.
- A counterexample stating the conditions are not necessary.
- Alternative way to solve for limiting distribution (Unique solution to a linear equation + a normalization condition).
- Example: Find limiting distribution of doubly stochastic matrix.
- Two interpretations of limiting distribution: (i) long run probability distribution over states no matter where is the initial state. (ii) mean fraction of time that Markov Chain spends in some state.

2 Irreducible Markov Chains (See 4.3.1)

- Definitions of accessible, communicate between states.
- Communication is an equivalent relation and the equivalent class induced by it is the set of states communicate with each other.
- The Markov chain with only one class is said to be irreducible.
- Some examples on classifying states and checking irreducibility.