Lecture on July 16th, 2019 Irreduciblity, Periodicity and Recurrence

1 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.

2 Periodicity (See 4.3.2)

- Definitions and examples of "period" of state i, $d(i)$ and "aperiodic".
- 3 properties of "period". Periodicity is a class property.
- For finite state Markov chain, regular is equivalent to irreducible + aperiodic.

3 Recurrence (See 4.3.3)

- Definitions and examples of "recurrent" and "transient".
- Distribution of number of times returns to state i.