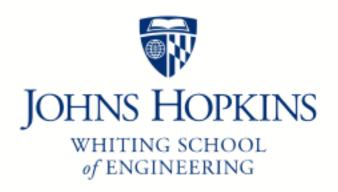
Johns Hopkins Engineering 625.464 Computational Statistics

Markov Chain Theory 2

Module 5 Lecture 5D



Necessary Definitions

A state to which the chain returns with probability 1 is called a <u>recurrent state</u>.

If the expected time until a recurrence is finite then it is called <u>nonnull.</u>

Let d(i) be the GC Divisor of all integers n such that $p_{ii}^{(n)}>0$.

More Necessary Definitions and a BIG Result

If d(i) =1, the state i is said to be <u>aperiodic</u>. Otherwise it is <u>periodic</u>.

If d(i)=1 for all i, then the Markov Chain is said to be aperiodic.

If a Markov Chain is irreducible, aperiodic, and all states are nonnull and recurrent, then the Markov Chain is said to be <u>ergodic</u>.

Steady State Results

$$S \times nS \left[Pi \right] = P$$

$$P'' = \left[Pi \sigma'' \right] = P''$$

$$\pi_{L}^{(t)} = P[X^{(t)}] \cdot \Pi_{L}^{(t)} = \Pi_{L}^{(t)} + \Pi_{L}^{(t)} \cdot \Pi$$

Main Result

If a Markor Chain w/ transition
matrix Pisergodic, then the
Stationary distribution (IT= TTP) is
unique and limiting.
unique and limiting.

Lim P(X=)[X=i]= H; Yi
n700 pcm) promos all Arbws TT TT-TTP TTO

How does this relate to the Monte Carlo Method?