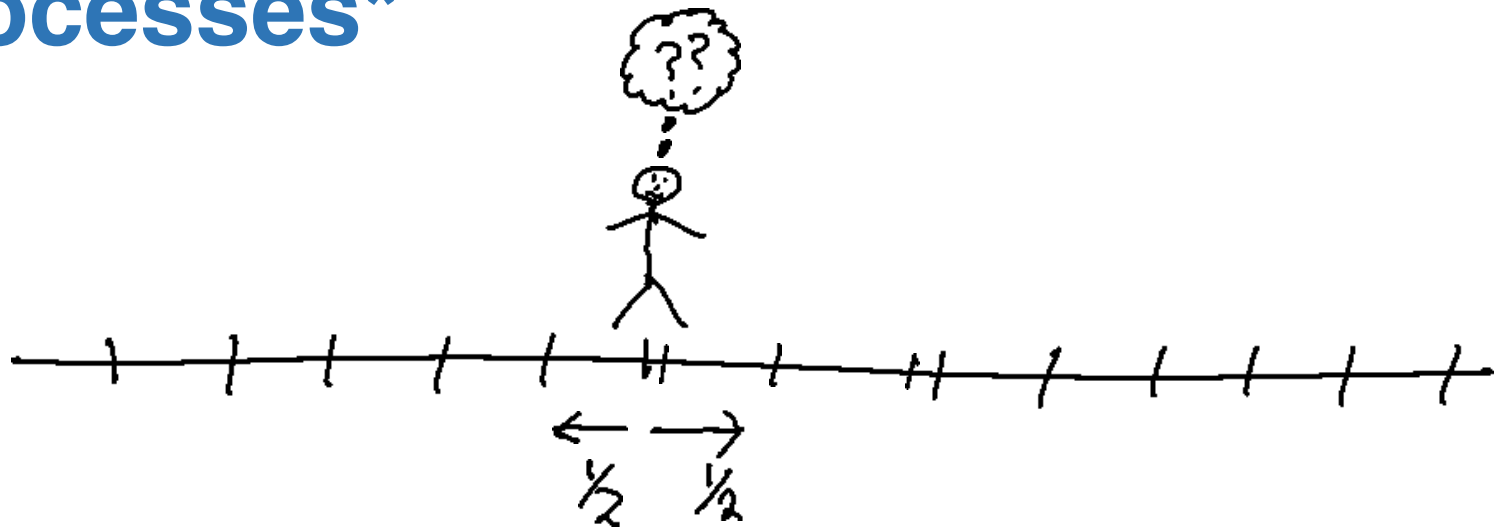
Math 303: Introduction to Stochastic Processes*



* More specifically, Markov chains

Markov chain (informal)

- A sequence of random values
- The distribution of the next value only depends on the current value (conditioned on current value and all previous values)

“What happens next only depends on the current state”

Why Markov Chains?

- Ubiquitous model for random evolution over time
  - Stock market
  - Population dynamics
  - Disease spread
- Data science tool
  - Google pagerank
  - Markov chain Monte Carlo
  - Hidden Markov Models
- Elegant and neat theory
  - You'll see

Textbook

"Introduction to Probability Models" by Sheldon M. Ross. (12th ed.)

We cover most of Chapters 4, 5, 6:

Part 1: Discrete time Markov chains (Chapter 4)
Part 2: Exponential distribution and Poisson processes (Chapter 5)
Part 3: Continuous time Markov chains (Chapter 6)

core material

finer points

Class structure

- Live lectures in person and recorded on zoom
- Weekly written homework due Fridays at 10pm (starting in Week 2), submissions in Canvas
  - Your homework should be original
  - Show work
  - Some test problems will be based on homework problems
- **Midterm Feb 27**, Final during final exam period

Grading Scheme:

- Homework 15%
- Midterm 35%
- Final 50%

Resources

- Piazza
- Textbook
- Lecture recordings
- Lecture notes
- Office hours:
  - Plan W 10:00 – 11:00am, F 1:00 – 2:00pm, MATX 1219
  - Dao Duc M 2:00 – 3:00 pm, W 11:00 am – 12:00 pm, MATX 1213
- Jupyter notebooks (in python)

Math Annex Building