

**CS394R**  
**Reinforcement Learning:**  
**Theory and Practice**

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# Good Morning Colleagues

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- Are there any (course logistics) questions?

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- Resources page

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- Next week's readings

# Chapter 3

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- Solution methods start in Chapter 4
  - What does it mean to **solve** an RL problem?

# Formulating the RL problem

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- Discount factor part of the environment

# Value functions

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- What if it's continuing?
- Continuing tasks without discounting?

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- It's an ideal
  - Will allow us to prove properties of algorithms
  - Algorithms may still work when not provably correct
  - If not, you may want different algorithms (Monte Carlo)

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- Solution methods **given a model**

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- Solution methods **given a model**
  - So no exploration vs. exploitation
- Use **bootstrapping**



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- Policy evaluation on the week 1 problem
  - undiscounted, episodic
  - Are the conditions met?

# Policy Improvement

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- Polynomial time convergence (in number of states  $n$  and actions  $m$ ) even though  $m^n$  policies.
  - Ignoring effect of  $\gamma$  and bits to represent rewards/transitions

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  - True in general?
- How important are the initial values?

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  - Then: no model, but bootstrapping