

# **Final Wrap-up and Summary**

**CSE 140: Spring 2022**

**Lecture 20 (Week 10)**

**The Grand Finale**

# Congratulations!

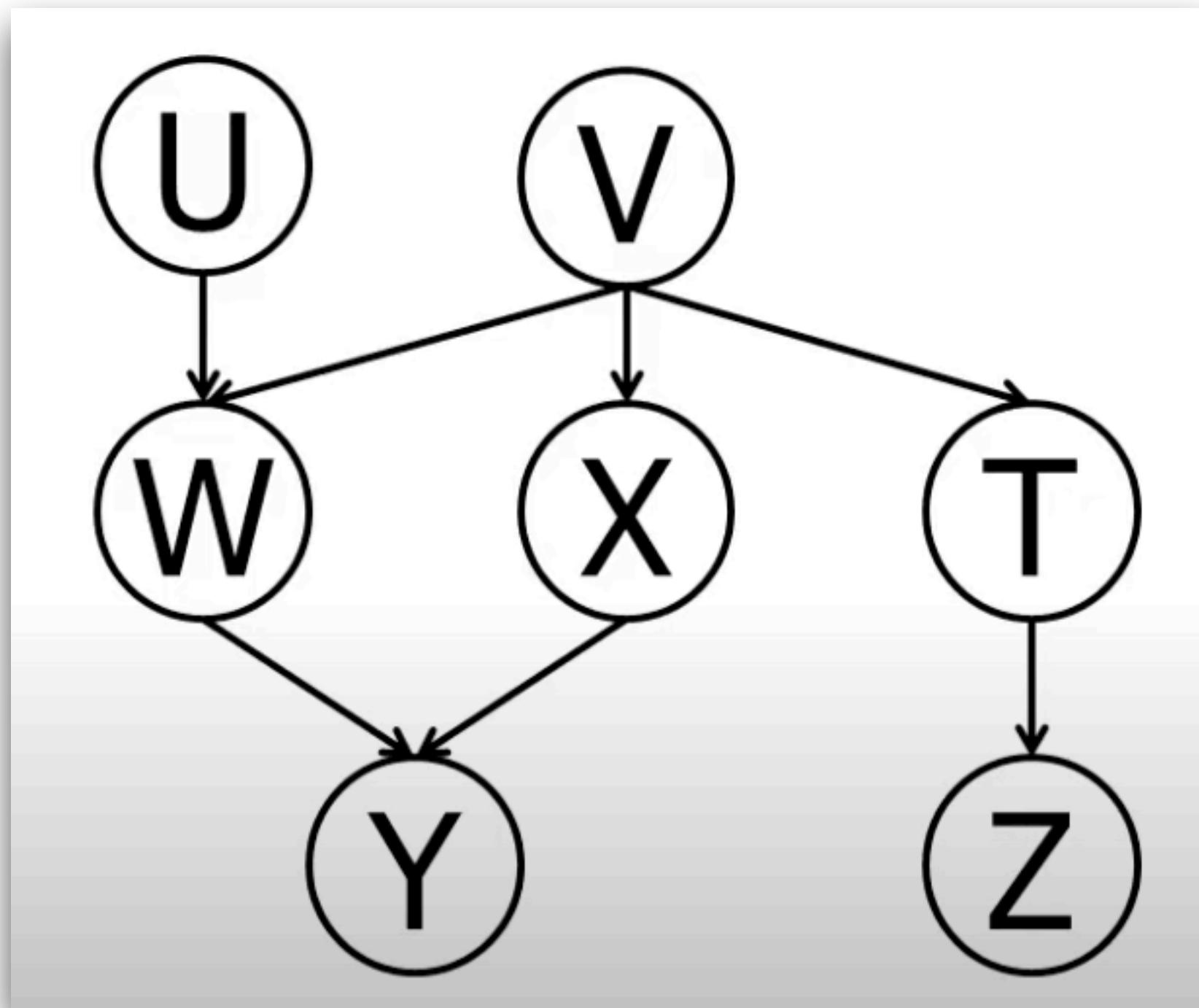
# Announcements

- P4 overview
  - **Report: Friday June 3 at 5pm**
- Summaries/review for M3-M6 on Canvas.
- Feedback form: <https://forms.gle/yZC2mqzv3Z43xGHQA>
- Please Fill Out Your SETS
  - Will give time at the end of class
  - (2 points extra credit if  $\geq 80\%$ ) . We're only at ~31% as of this afternoon.

# Agenda

- Topics
  - Go through last CE
  - Tournament Discussion (CE) & Results
  - Wrap up
  - SETs time

# Last time: CE 16



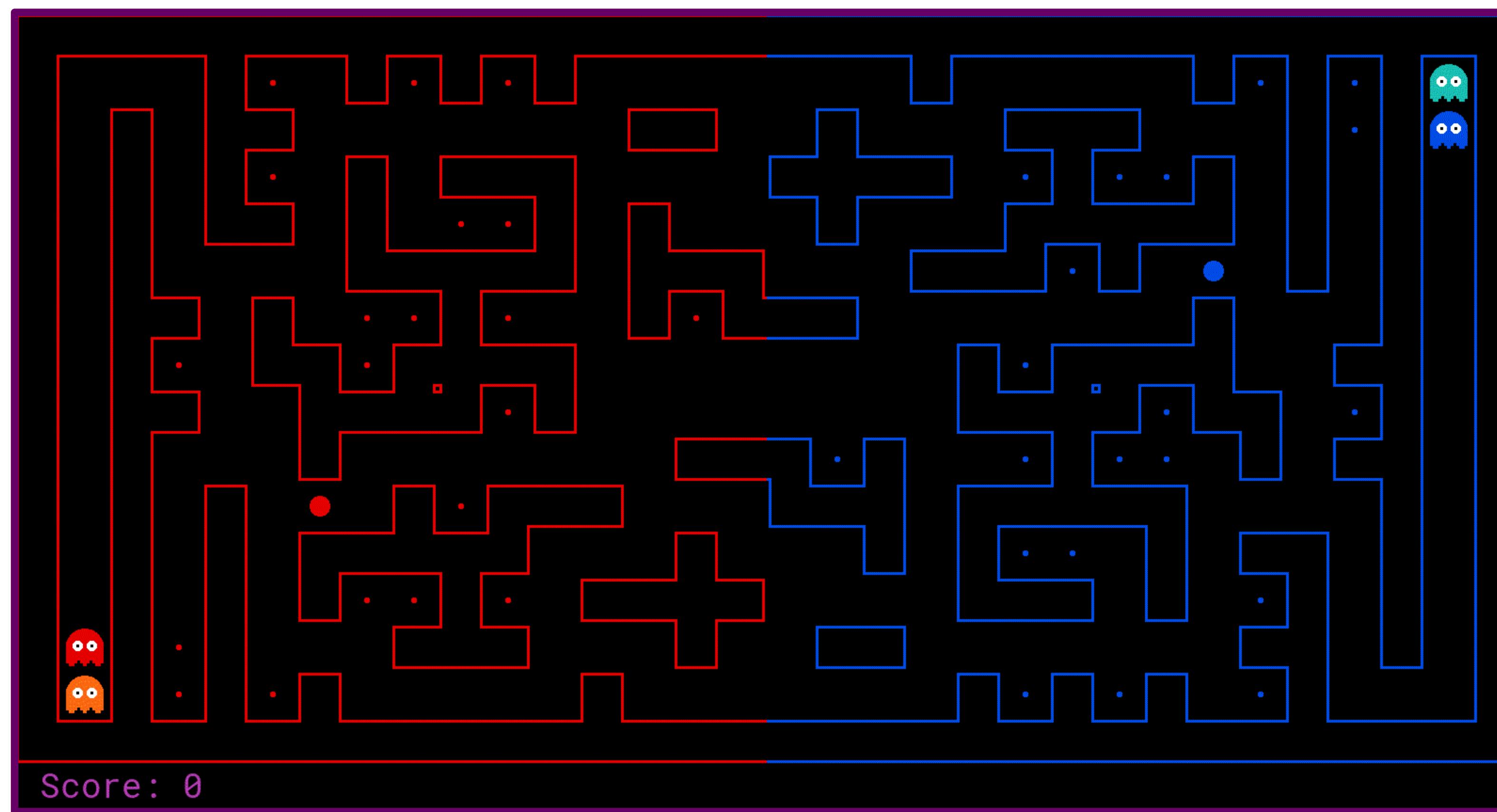
$U \perp\!\!\!\perp V | X?$

$U \perp\!\!\!\perp V | W?$

# CE 17: P4 Final Tournament Discussion

- For this class exercise you will be discussing with your fellow classmates about strategies you used that you found interesting or fun, or just strategies you want to share with others. This is an opportunity to discuss strategies, learn about different cool ideas other teams used or anything which you found interesting! :)
- Discuss and share an interesting strategy or technique you learned from your fellow classmates or other fun facts learned during your discussion.
- Have fun! :)
- We will come back in ~5-10 minutes

# Drum Roll Please ...



# Honorable Mentions:

- RR (4th place)
- TheGnomes (5th place)
- TheCleanupCrew (3rd place 5/30)
- Ghostbusters (4th place 5/30)

# Third Place:

- Noodle

# Second Place:

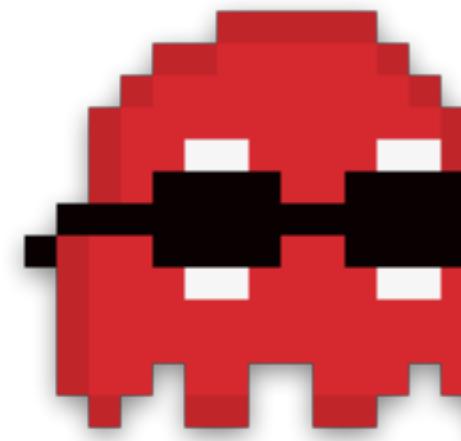
- Noodle
- CynthiasBoys

# First Place:

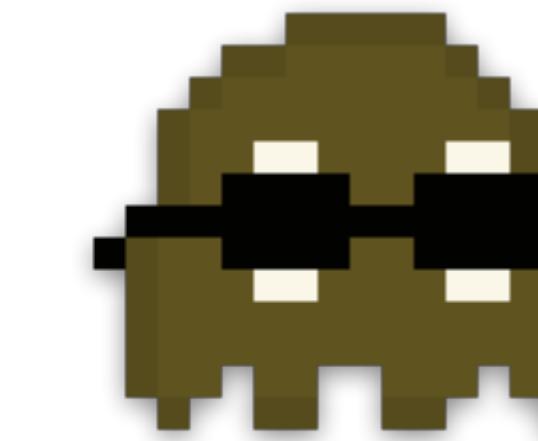
- Noodle
- CynthiasBoys
- PacManiac

# TA Agents

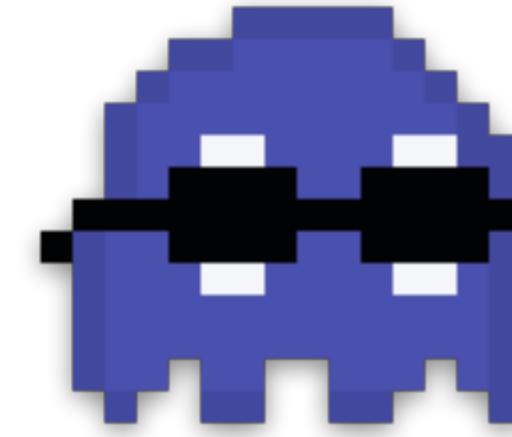
SomeSlug



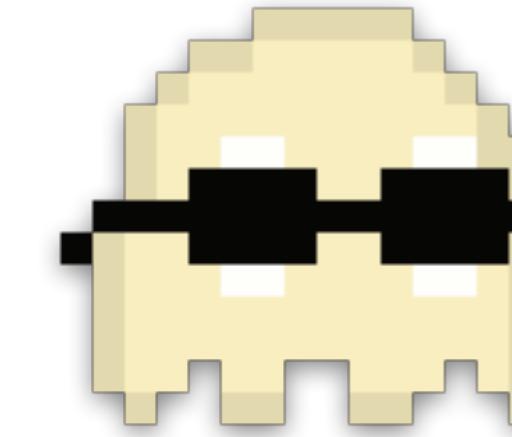
SlugTrap



SecretAgentSlug



SlugBrain



Baseline



# Advanced Applications

- Natural Language Processing
- Robotics
- Computer Vision

# What is NLP?

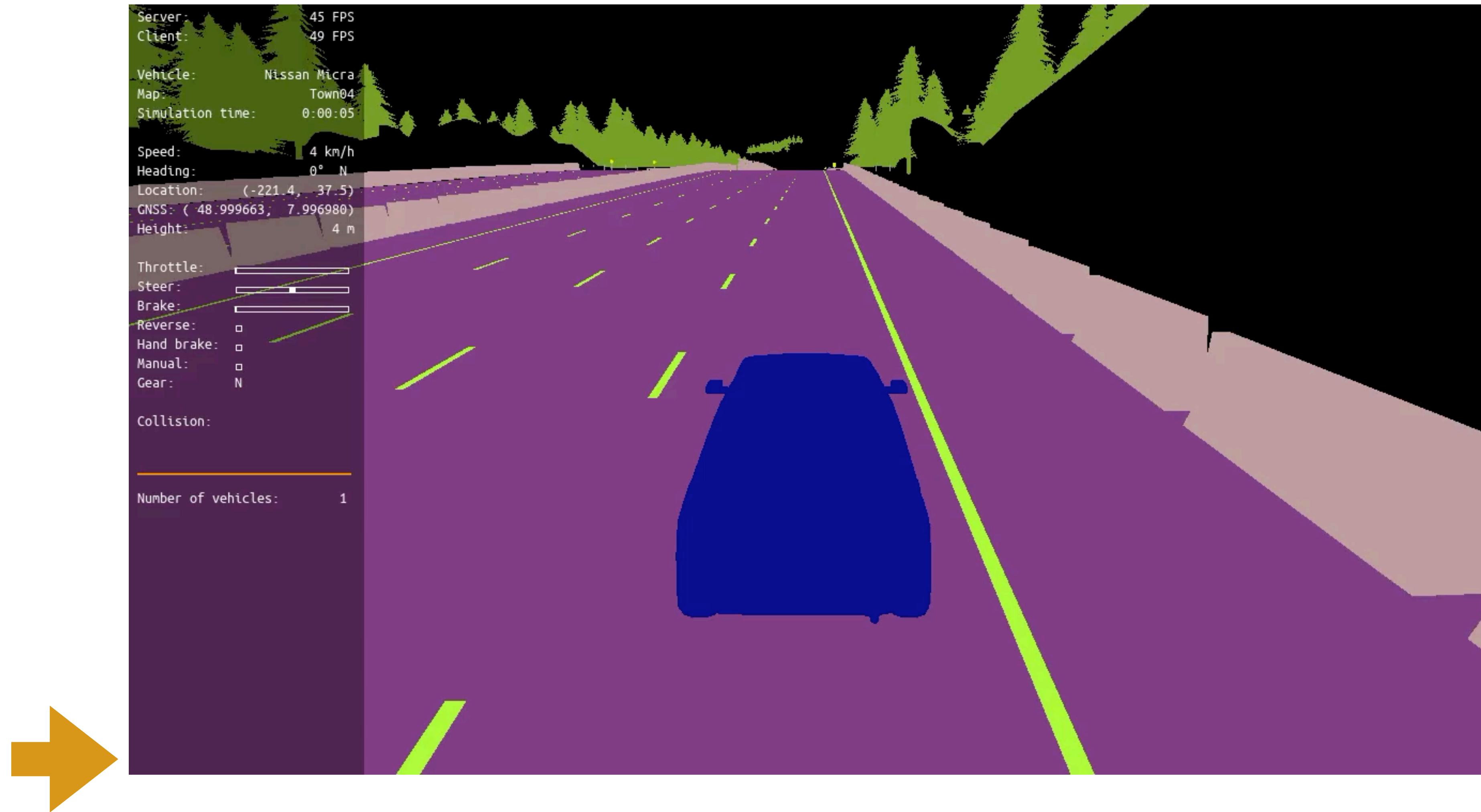


- Fundamental goal: analyze and process human language, broadly, robustly, accurately...
- End systems that we want to build:
  - Ambitious: speech recognition, machine translation, information extraction, dialog interfaces, question answering...
  - Modest: spelling correction, text categorization...

# Autonomous Vehicles



# Autonomous Vehicles



# Computer Vision



# Advanced Applications Summary

- All these advanced applications (and more!) build on basic building blocks from this class!

# AI & Ethics

- Growing concerns about autonomous agents
  - Dystopian Scenarios: take away jobs, take over world, make humans obsolete
  - Utopian Scenarios: optimize efficiency, make the world a safer place, make more leisure time
- Whichever scenario you subscribe to, there are challenging ethical dilemmas that go beyond technology.
- We need AI experts that are well-versed in ethics and policy makers that are educated in AI to start having intelligent conversations

# Asilimar AI Principles: Research

- 1) Research Goal: The goal of AI research should be to create not undirected intelligence, but beneficial intelligence.
- 2) Research Funding: Investments in AI should be accompanied by funding for research on ensuring its beneficial use, including thorny questions in computer science, economics, law, ethics, and social studies.
- 3) Science-Policy Link: There should be constructive and healthy exchange between AI researchers and policy-makers.
- 4) Research Culture: A culture of cooperation, trust, and transparency should be fostered among researchers and developers of AI.
- 5) Race Avoidance: Teams developing AI systems should actively cooperate to avoid corner-cutting on safety standards.

# Ethics and Values

- 6) Safety: AI systems should be safe and secure throughout their operational lifetime, and verifiably so where applicable and feasible.
- 7) Failure Transparency: If an AI system causes harm, it should be possible to ascertain why.
- 8) Judicial Transparency: Any involvement by an autonomous system in judicial decision-making should provide a satisfactory explanation auditable by a competent human authority
- 9) Responsibility: Designers and builders of advanced AI systems are stakeholders in the moral implications of their use, misuse, and actions, with a responsibility and opportunity to shape those implications.
- 10) Value Alignment: Highly autonomous AI systems should be designed so that their goals and behaviors can be assured to align with human values throughout their operation.
- 11) Human Values: AI systems should be designed and operated so as to be compatible with ideals of human dignity, rights, freedoms, and cultural diversity.

# Ethics and Values

- 12) Personal Privacy: People should have the right to access, manage and control the data they generate, given AI systems' power to analyze and utilize that data.
- 13) Liberty and Privacy: The application of AI to personal data must not unreasonably curtail people's real or perceived liberty.
- 14) Shared Benefit: AI technologies should benefit and empower as many people as possible.
- 15) Shared Prosperity: The economic prosperity created by AI should be shared broadly, to benefit all of humanity.
- 16) Human Control: Humans should choose how and whether to delegate decisions to AI systems, to accomplish human-chosen objectives.
- 17) Non-subversion: The power conferred by control of highly advanced AI systems should respect and improve, rather than subvert, the social and civic processes on which the health of society depends.
- 18) AI Arms Race: An arms race in lethal autonomous weapons should be avoided.

# Longer-term Issues

19) Capability Caution: There being no consensus, we should avoid strong assumptions regarding upper limits on future AI capabilities.

20) Importance: Advanced AI could represent a profound change in the history of life on Earth, and should be planned for and managed with commensurate care and resources.

21) Risks: Risks posed by AI systems, especially catastrophic or existential risks, must be subject to planning and mitigation efforts commensurate with their expected impact.

22) Recursive Self-Improvement: AI systems designed to recursively self-improve or self-replicate in a manner that could lead to rapidly increasing quality or quantity must be subject to strict safety and control measures.

23) Common Good: Superintelligence should only be developed in the service of widely shared ethical ideals, and for the benefit of all humanity rather than one state or organization.

# You Have the Power!

- You now have the basic tools
- We all have the responsibility...



**"I got laid off, I wonder  
who they replaced me with"**  
**AI robots:**



# Summary

- AI Pillars:
  - Representation
  - Reasoning
  - Learning

# AI Toolkit

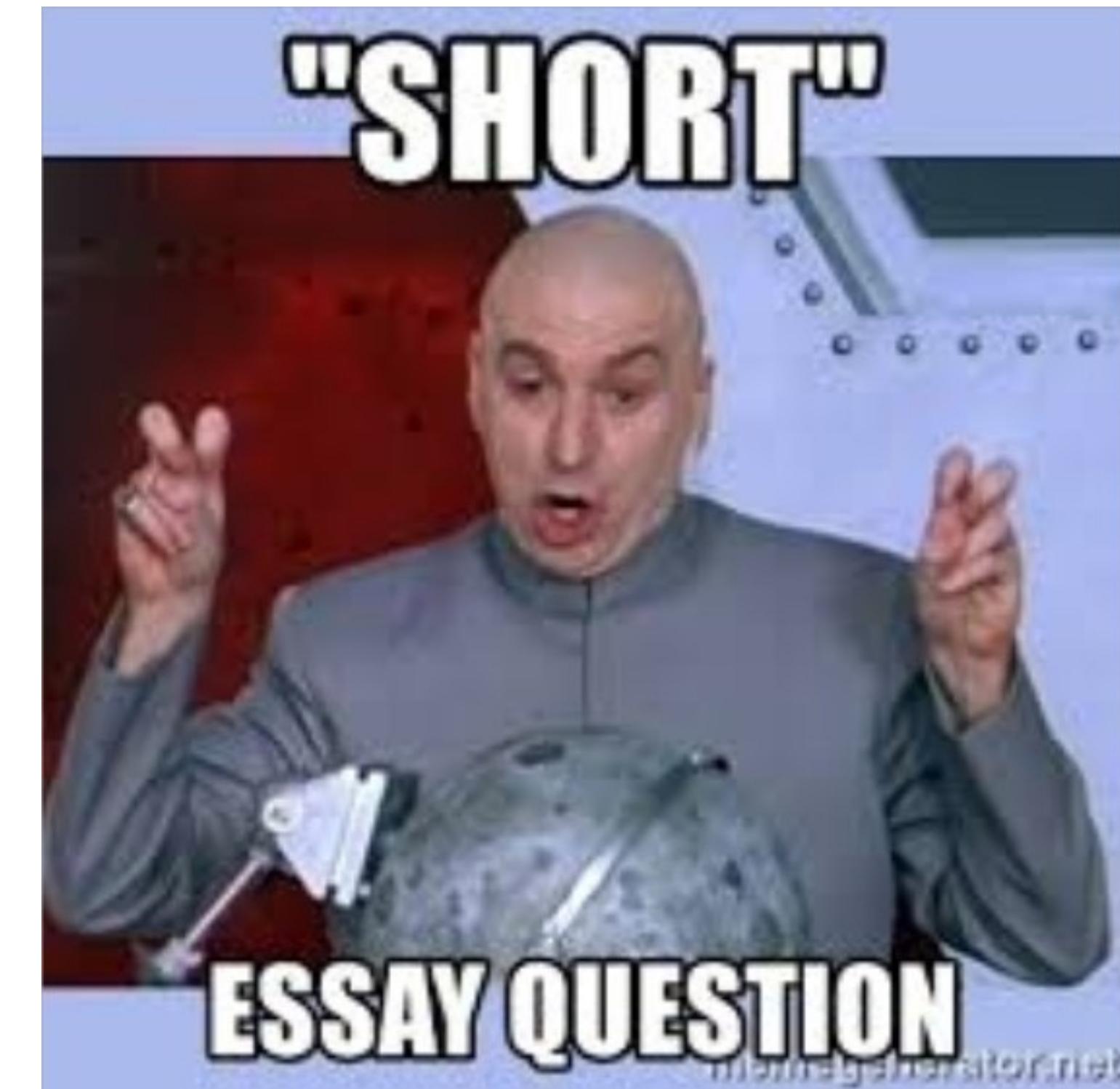
- You have learned a collection of tools:
  - Search
  - Constraint Satisfaction
  - Adversarial Search
  - Markov Decision Processes
  - First-order Logic
  - Probabilistic Reasoning
  - Learning
- I hope that when you encounter a new problem, you can pull out this toolkit, and see what method(s) are applicable!

# Final

- Monday June 6th 8am-11am
- Cumulative
  - A\*
  - Minimax
  - AlphaBeta pruning
  - Expectimax
  - Resolution Refutation
  - CSP
  - MDP
  - Bayesian Network + Independence
  - Variable Elimination
  - AI Problem Solving
- Should take ~2 Hours (we give you 3!)

# Topics

- General ideas from all 6 modules
- Know when to apply what kind of algorithm
- In particular:
  - Search
  - CSP
  - Adversarial ML
  - MDPs & RL
  - FOL & Theorem proving
  - BNs

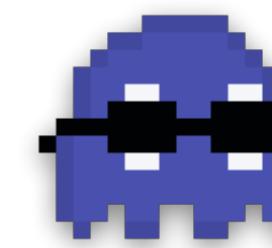


**TIME TO ASK**

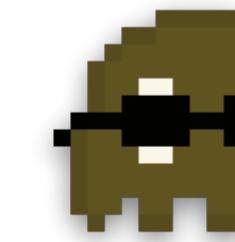
**QUESTIONS!**

[memegenerator.net](http://memegenerator.net)

# **THANK YOU to AWESOME TAs!!!!**



TA: Gabe Hinojoza

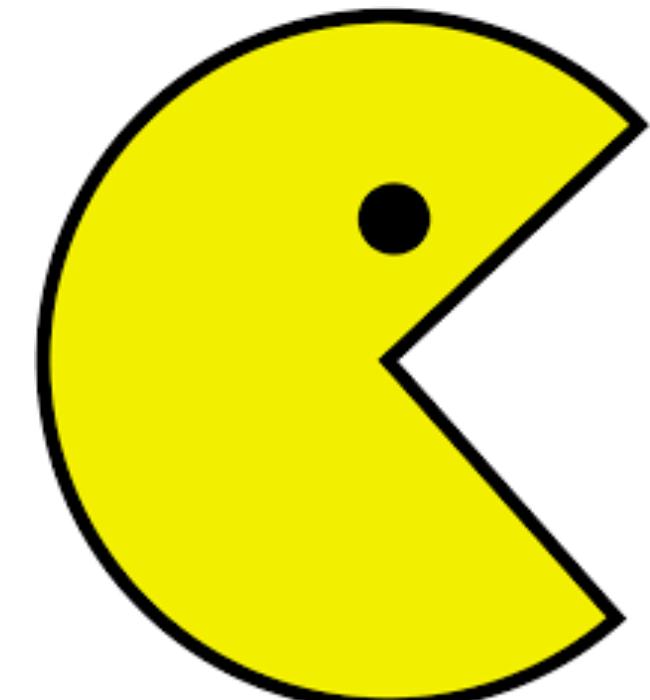


TA: Brian Schwarzman

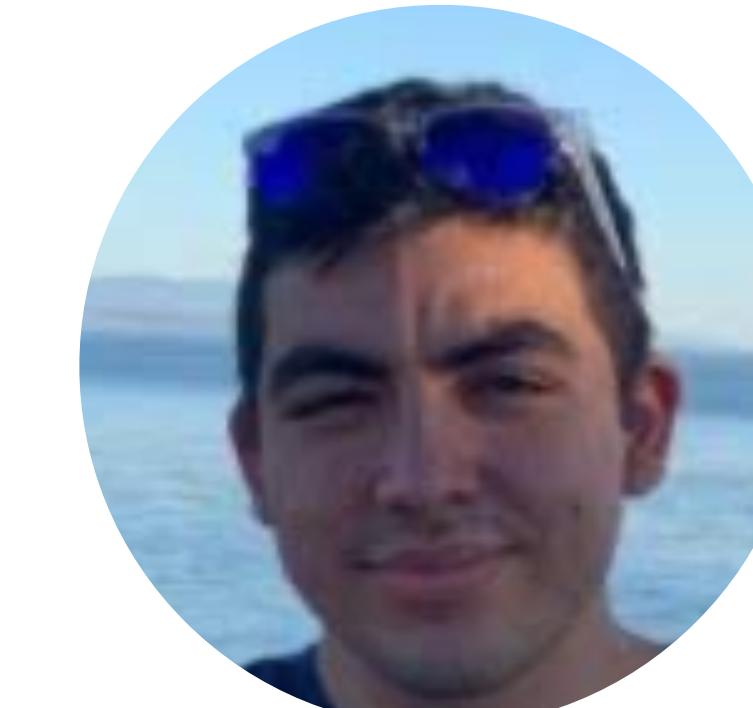
# **THANK YOU to AWESOME Tutors and Zoom Corps!!!!**



Tutor: Aylin Akkus



Tutor: Batu Salih



Tutor: Bryan Rodriguez



Zoom Corps: Allison Dean



C R A Z Y   T I M E S

**Thank \*You\* For Being  
An Awesome Class!!  
Good Luck!!!!**

# Congrats to the graduates!



PLEASE FILL OUT YOUR SETS!!!!

