CSE 631: Course Project Guidelines

Weight: 25% of final grade

Overview

Each student (or pair of students) will complete a course project applying methods from class to a small research or implementation problem. The project is intended to give you hands-on experience with game-solving methods in a setting of your choice.

Deliverables

- **Proposal (1 page)**: problem statement, plan, and resources.
- **Code/Notebook**: implementation and/or experiments.
- **Written Report (approx. 4 pages)**: motivation, methods, results, and discussion.
- **Presentation (5–7 minutes)**: concise summary of the project.

Timeline

- Proposal due: Week 6.
- Project Progress Report: Week 11
- Final presentations: Week 14.
- Final report and code due: Last day of class.

Evaluation

Projects will be graded on:
- **Proposal and Progress Report (10%)**: clarity, feasibility.
- **Code/Notebook (20%)**: correctness, readability, and experimentation.
- **Final Report (50%)**: motivation, methodology, analysis, clarity of writing.
- **Presentation (20%)**: clarity, conciseness, and ability to explain to peers.

Possible Project Directions

Your project may take one of several forms:
- **Implementation-focused:** implement an algorithm from class and test on benchmark games.
- **Experimental:** compare multiple algorithms or variations in practice.
- **Theoretical:** analyze a property of an equilibrium concept or algorithm.
- **Application:** model a real-world strategic scenario as a game and explore solution methods.

Example Ideas

- Implement Counterfactual Regret Minimization (CFR) and evaluate it on Kuhn Poker, comparing different update rules.

- Compare the performance of Follow-the-Leader, Hedge, and Multiplicative Weights Update on repeated Rock–Paper–Scissors.
- Analyze correlated equilibria in a small congestion game and interpret results.
- Model a simple resource-allocation or auction scenario as an extensive-form game and compute approximate equilibria.