

# Final Project Manual

## Final Project Manual: Reinforcement Learning for Tic Tac Toe

### Phase 1: 2D Tic Tac Toe (3x3 Grid) - Value Iteration Implementation

- **Objective:** Build an AI agent using value iteration to play 2D Tic Tac Toe on a 3x3 grid.
- **Deadline:** November 14th, 2023.

### Phase 2: 2D Tic Tac Toe (4x4 Grid) - Q Learning Implementation

- **Objective:** Construct an AI agent using Q learning to play 2D Tic Tac Toe on a 4x4 grid.
- **Deadline:** November 21st, 2023.

### Phase 3: 3D Tic Tac Toe (4x4x4 Grid) - Open-Ended AI Design Competition

- **Objective:** Develop an AI model for 3D Tic Tac Toe on a 4x4x4 grid, employing various approaches to create an optimal policy.
- **Deadline:** December 8th, 2023.
- You can play the game here: <https://www.mathsisfun.com/games/foursight-3d-tic-tac-toe.html>

### Grade Distribution:

- **Final Project Demo:** 50% weightage.
- **Final Report:** 10% - Comprehensive documentation detailing the strategies employed for each phase.
- **Phase 1 and Phase 2:** 10% each. Sufficient guidance will be provided.
- **Competition Performance:** 20% - Round-robin format with 10 games per round; scoring: +1 for a win, 0 for a draw, -1 for a loss. Tiebreakers will be resolved through

additional matches.

Throughout the project, instructional support from the instructor and TAs will be available to ensure a comprehensive understanding of the concepts and techniques involved in reinforcement learning for Tic Tac Toe.

For any queries or clarifications, please feel free to reach out to the instructor or the teaching assistants.

Best of luck for a successful project journey!

## Plagiarism Policy

Plagiarism in any form will not be tolerated and will result in severe consequences, including but not limited to academic penalties and disciplinary action. Students are expected to adhere to the following guidelines:

- Refrain from directly copying code or solutions from external sources, including online platforms, forums, or previous projects.
- Understand and implement the concepts and algorithms independently, utilizing external resources for reference purposes only.
- Provide proper citations and attributions for any external resources, code snippets, or research findings used in the project.

Any instances of plagiarism or academic dishonesty will be thoroughly investigated, and appropriate actions will be taken in accordance with the institute's academic integrity policy.

It is the responsibility of each student to uphold academic honesty and integrity throughout the duration of the project.