Using Reinforcement Learning to Train a Tetris Agent

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I.   Motivation

Reinforced Learning is a powerful tool of solving complex problems. In this project we are interested in using this method to find the best answer to a problem that is not too grand for a course project but is difficult enough for an agent to learn and improve upon. Our idea is to teach an agent to play a game of Tetris.

II.   Method

We plan to either create a basic version of tetris ourselves in Python or use an open source version of the game if it exists to simplify the process. By using the game score as the reward for the agent, we will be able to motivate it to play as long as possible by taking into account immediate and future rewards. We will also be able to save previous attempts at the game to help the agent learn from past mistakes.

III.   Intended Experiments

We intend to optimize our reinforcement learning algorithm so that the agent can play Tetris as long as possible. We also will experiment with aiming to get the highest achievable score at each state given the environment and previous states. Evaluation will be done through how many lines the agent can clear and how low it can keep the height of the playfield to avoid game over.

IV. Planning and Milestones

1. Setting up a Github repository (February 11th - Luc)
2. Getting a playable version of Tetris working (February 18th - Jonathan).
3. Modify Tetris if needed to work with an agent (February 25th Alfred).
4. Training the agent (April 1st - Everyone)
5. Documenting results and adjusting values as needed to further improve the results (April 8th - Everyone)
6. Presentation (Videos/Slides) (April 13th - Luc)
7. Writing the report (April 19th - Everyone)
8. Submit report (April 19th)