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Project 3 - Adversarial Search

Option #2 - Opening Book

Submission includes a table or chart with data from an experiment to evaluate the performance of their agent. The experiment should include an appropriate performance baseline. (Suggested baselines shown below.)

1. **Baseline: #my_moves - #opponent_moves heuristic from lecture (should use fair_matches flag in run_match.py)**
   Opening book
2. **Baseline: randomly choosing an opening move (should *not* use fair_matches flag in run_match.py)**
   Advanced Search Techniques
3. **Baseline: student must specify an appropriate baseline for comparison (student must decide whether or not fair_matches flag should be used)**

Opponent	# Matches	Win Percentage	Fair_matches
MinMax	**20**	**60%**	**False**
MinMax	**20**	**40%**	**True**
Greedy	**20**	**100%**	**False**
Greedy	**20**	**50%**	**True**
Self	**20**	**50%**	**False**
Self	**20**	**50%**	**True**

Using Alpha_beta_prunning algorithm seems to be very consistent on predicting winning moves and it's really fast when a good opening_book is entered.

Describe your process for collecting statistics to build your opening book. How did you choose states to sample? And how did you perform rollouts to determine a winner?

I mostly did alpha_beta_pruning to depth 4 then randomly selected actions from the available actions and returned a score of best available moves for current player

What opening moves does your book suggest are most effective on an empty board for player 1 and what is player 2's best reply?

The most frequent opening move by the opening_book is the top left corner and the player 2’s reply is a square adjacent to it.