Sidharth Daga
Ethan Honey

"Assignment 3 for CSE 415, Autumn 2022, University of Washington"

**Deterministic Simplified Backgammon Agent**

- We partner coded this file, working through our solution and debugging errors together.
- The static eval function accounts for the pieces off, pieces on the bar, the pip count, and solo pieces.
    - The largest factor weighted is pieces off by a factor of a 1000, with white off minus red
    - All the other factors are red minus white, because having a piece on the bar, a higher pip count, and solo pieces, are all bad indicators.
        - Pieces on the bar are weighted by 500, pip count and solo pieces by 10
- We were unsure how to implement a successors best-first version of pruning, however we still coded a recursive Alpha-Beta function that checks for cut-offs and returns the relevant alpha or beta values depending on whether we are maximizing or minimizing

**Stochastic Simplified Backgammon Agent**

- Again we partner coded this together
- We adapted our move_helper function to run a recursive version of expectiminimax, weighting each possible outcome by 36
- We attempted to implement Zobrist hashing to improve performance, however, due to no hash or equal methods being implemented in the state object class this currently does not get used

**Partnership retrospective (required for the partnership bonus)**.
What issues you faced or didn't face related to the partnership.

- Collaborating on code simultaneously was a challenge but we made effective use of GitHub to make changes to our code in turn
- We also attended office hours together to gain a deeper understanding of how to solve the problems at hand

Lessons you learned as a result of working in this partnership -- Ethan Honey. (Give Partner 1's name and 2 to 10 lines describing AT LEAST ONE lesson.)

- I learned that once you break problems down together into their individual parts it reduces the difficulty of solving them by a lot - this is particularly true when coding recursive functions as once you get a correct function it works instantly.

Lessons you learned as a result of working in this partnership -- Sidharth Daga. (Give Partner 2's name and 2 to 10 lines describing AT LEAST ONE lesson.)

- I learned that when working with a partner, both people figure things out and come to an understanding at a different rate, so before getting started it is important to conceptualize

things on your own and then with having a partner you can clarify doubts. Helping explain concepts to someone else in turn helps you understand them better

**Optional additional comments**

- In future if we had more time we would play around with different agents with different static evaluation functions and run them multiple times to work out which one is the ‘best’
- We would also investigate ways of speeding up the process via dynamic programming, Zobrist hashing or pre-determining some of the states’ static evaluations