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Capstone Title: MiniBot: Adversarial Search Bot for Two-Player Grid Game

Capstone Abstract: In this project, I developed an AI bot to play a two-player zero sum game involving a grid. In this game, there are two players who each try to claim as much area on the grid as possible, without having the head of a player hit the tail left by an unenclosed region of the other player. This AI bot uses adversarial search, specifically the mini-max algorithm. However, because this game has many states and a large game tree, I additionally used alpha-beta pruning to evaluate non-terminal states. This method used a heuristic function, which was very important for game playing performance and winning games. This heuristic function considered the most important aspects of the game, such as how much space a player has claimed on the grid, and integrates them into the calculations made by my AI bot for what move to make next. In terms of future work, this AI bot could improve by keeping track of prior moves in a list, and making sure that it does not move back and forth between the same two spaces over and over again, which was an issue that sometimes occurred. My AI bot ended up defeating RandBot (makes random moves) 95% of the time, SafeBot (makes safe moves) 81% of the time, AttackBot (makes aggressive moves) 66% of the time, and the TA bots 50% of the time. Overall, this project contributed an efficient but accurate way for solving a complex two-player grid game.