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AI Project Proposal

**Goal:** To create an engine that runs the game of Go, and an AI that can play against a human player.

<http://en.wikipedia.org/wiki/Go_(game)>

**Part 1: The engine**

The engine must accurately maintain the state of the game, carry out necessary computations and make sure that the moves are legal. This involves but is not limited to keeping track of where the pieces are and the groups that they form, which groups are dead and alive, the ko’s, and carrying out capture operations.

This will be implementedusing algorithms such as union-find and object oriented programming to efficiently represent the board. There will be a board class, piece class, player class and group class that will be used to represent the state of the board.

**Part 2: The AI**The minimax algorithm with alpha-beta pruning will be performed on the game tree in order to find the best possible move for the AI. The evaluation function will be based off of heuristics such as group liberties, group density, shape, etc since humans make moves largely based on heuristics. This is because the game tree is several magnitudes larger than the game tree for chess so looking ahead using brute force is not an option.

Making a strong AI can be extremely complicated since even the best Go AI’s today using a wide variety of algorithms in combination and running on massive computing power still cannot defeat the top players. Thus, the AI will probably only be strong enough to beat novices on small boards (9x9).