

ECS 170 Programming Assignment 2: Code Structure & Requirements

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Overview of modules (Java classes)

- Main: program entry; check out options (especially, -text)
- GameStateModule: generic representation of a game; e.g. board state, whose turn, makeMove, etc
- GameController: controller coordinating a game; e.g. calling each player to move
- Display: a graphical interface for the game board
- AIModule: base (abstract) class defining the method you need to implement
- RandomAI, MonteCarloAI, StupidAI: sample implementations of base AIModule

Design evaluation function: given a board state, assign a numerical value to the board.

- motivation: consistent with human expectation in obvious cases?
- a precise definition; what the variables are? e.g. # of red pieces in a row — ...
- one worked example

Implement basic minimax

- name your file "minimax_[team name].java"
- extend AIModule
- one single method to implement: getNextMove(); feel free to define private helper methods

Note about chosenMove and while(!terminate) loop

- play your minimax from Part 2 **five** times against each of RandomAI and StupidAI.
- play your minimax from Part 2 **ten** times against MonteCarloAI
- submit the results (-t option, **final board states only** and the number of games your minimax wins against each other AI player) for total 20 games
- use the seeds 1-10 for MonteCarloAI (-seed?? I'll check out later)

Successor function: move ordering

- motivation, intuition, ...
- examples with your evaluation function together??

Convince us!

Implement alpha-beta pruning with your evaluation function and move ordering

- name your file "alphabeta_[team-name].java"
- feel free to play against other teams on your own (make sure to play as both player 1 and player 2)
- we grade by playing each team against every other team
- bonus for the top four teams (20, 15, 10, 5)

Good luck!