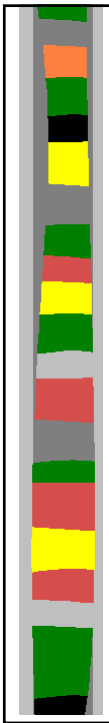
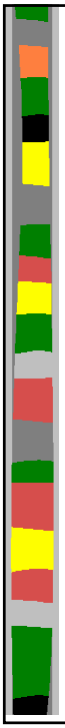


Shallow Blue

Project 2

Due date: April 5th



Introduction

- Second in series of three projects
- This project focuses on getting AI opponent
- Subsequent project will develop Networking

- You will work individually for this project!
  - No groups
  - Encouraged to talk about solutions with class mates
  - Can help each other debug code
  - Cutting and pasting or mailing code → too much

Details (1 of 2)

- Make a computer-controlled chess opponent (Shallow Blue) for your chess game
  - Build upon project 1
- The game should support:
  - Legal chess moves (as in Project 1) taken in turn, by Blue.
  - "Smart" moves by Blue
    - Blue should try to win and not just move pieces randomly
  - Levels of difficulty. Blue should have settings, making it an easier or harder opponent
    - You choice: Depth/Time, Evaluation, Random
    - GUI front end allow player to change

Details (2 of 2)

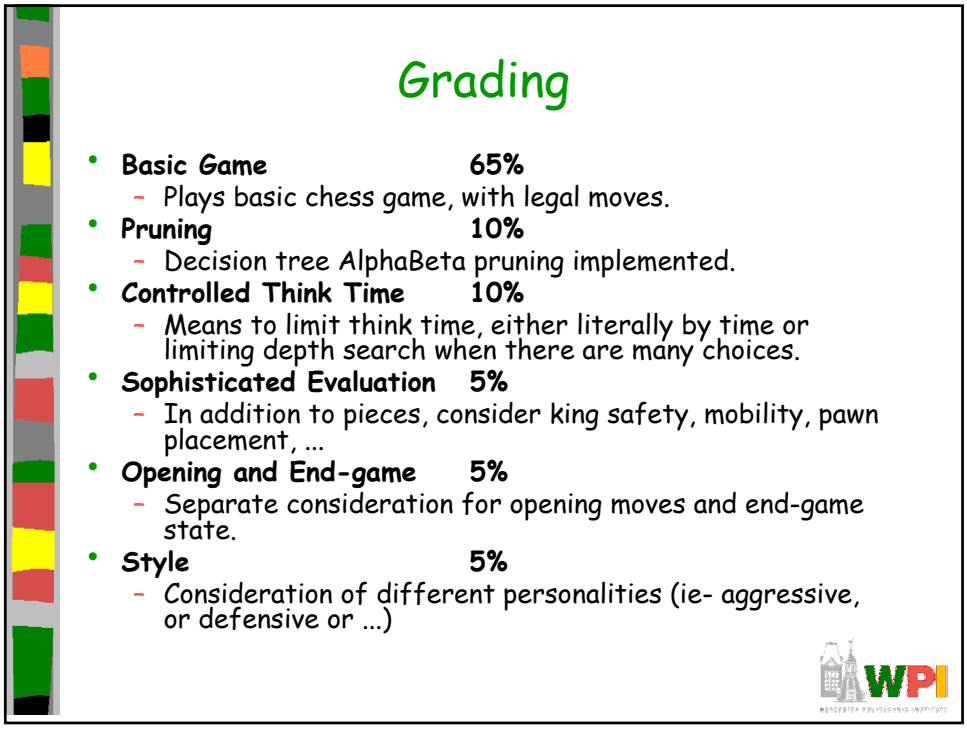
- Advanced:
  - "Think" time: does not have to spend same amount of time per move, but make sure doesn't think too long
  - Sophisticated Evaluation function: Basic count of material (ie- pieces) good, but a lot of additional enhancements that might be added
  - Opening vs. Mid-Game vs. End-Game: Evaluation of opening moves or end-game state may proceed differently than mid-game state.
  - Personality: Different versions of Blue (selected randomly, is fine) may be more aggressive or defensive or ...
    - Can change with Evaluation
- You will use:
  - MinMax search algorithm
    - with AlphaBeta pruning
  - A board evaluation (lecture notes coming up have details)
- Implement in your choice of language (C, C++, Java, ...)
  - Use a language you are familiar with!

Links

- See project Web page:
- MinMax tree links
- Evaluation strategies for Chess
- Chess links from project 1
- Note, may have tournament!
  - May the best Blue win
  - Prize!

Submission

- Will use command line (Unix) turnin
- Submit all source files necessary to compile and run program
  - Any Makefiles, etc.
  - All art (as appropriate)
- README
  - Saying how to build, platform, etc.


Grading
Basic Game 65%
Plays basic chess game, with legal moves.
Pruning 10%
Decision tree AlphaBeta pruning implemented.
Controlled Think Time 10%
Means to limit think time, either literally by time or limiting depth search when there are many choices.
Sophisticated Evaluation 5%
In addition to pieces, consider king safety, mobility, pawn placement, ...
Opening and End-game 5%
Separate consideration for opening moves and end-game state.
Style 5%
Consideration of different personalities (ie- aggressive, or defensive or ...)
WPI