1. My goal for this project was to create a chess engine with artificial intelligence and a GUI for the engine. I expected to be able to use alpha beta tree pruning to do this, as well as produce a fast, yet effective algorithm for ranking the board. I also really wanted to program special moves such as castling and en passant.
2. I was able to implement alpha beta tree pruning for the AI part of the project. I had some difficulty implementing the algorithm because I was not that familiar with the algorithm and it was kind of confusing. Eventually, after hours of debugging, I was able to get it to work. For the alpha beta tree pruning, I had to figure out how to score each board. I went with a basic approach of rating the material, based on their point value, and found some boards online that ranked the position of each piece. Using that and giving a point value to how many spaces a piece could move multiplied by an arbitrary value I assigned to the piece. I only implemented the white side of the board and then “flipped” the board for the black side. Basically, I just switched the sides the pieces were on and changed black to white and vice versa.
3. I ended up creating a killer chess engine, although I was unable to implement the special moves. I also think my rating algorithm is a bit simple, which I hope I can improve on in the near future. The more depth the pruning algorithm needs to check, the slower it is. This speed is almost unbearable at a depth of five (hard). Overall, I did meet my expectations to create a good AI.
4. If I were given more time, I would definitely implement the special moves and make it a two-player game as well. I would also try to improve my algorithm so the chess engine is better. I would also want to figure out how I could improve the speed of my alpha beta pruning algorithm as well as use dynamic programming in some sort of way. One of my stretch goals would be to implement neuro-networks to have the chess engine make itself better.
5. - Implemented chess AI using alpha beta tree pruning

- Created Graphical User Interface for chess engine

- Implemented a rating system that evaluates a board

- Implemented moves only using white side of the board

- Used knowledge of algorithms to implement the rating system and tree pruning



