

# Introduction to chess analytics

This document is to get you started with learning the rules of chess, and how to evaluate chess games on a computer.

## Rules of chess

1. Find out how all chess pieces move. What is the goal of chess? When does a game end? I think the best way to learn chess is not with a textbook, but by watching videos (Douyin/Youtube), or an online chess website like [chess.com](https://chess.com).
2. There are different rule sets in chess: classical, rapid, blitz. Read about what these mean.
3. Chess players are ranked by a system called ELO. What is ELO? Who is the top chess player in the world?
4. A game of chess can be divided into three phases: the opening, middlegame and endgame. What are these? What is a chess opening?
5. In chess, each chess piece (pawn, bishop, knight, etc) has a value. What are the values of each piece?
6. Learn about chess notation. What does “1. e4 e5” mean?
7. Sometimes, chess moves are marked with symbols e.g. “!” , “!!” , “!?” , “??” What do these mean?

## Evaluating chess games on a computer

8. Learn about the Stockfish software. You can play a game against Stockfish on [chess.com](https://chess.com).
9. How is Stockfish able to tell the quality of a player's chess moves? How can you tell which player is winning during a chess game?
10. Chess games are often stored on files with formats such as .pgn. What are some other common file formats for chess games?
11. There are some Python packages to open .pgn files, display the chess moves, and also calculate the move accuracy with Stockfish. Search for them and follow the tutorials.

# Project

For this task, you need to evaluate the World Championship match between GM Ian Nepomniachtchi and GM Ding Liren. The match was won by GM Ding, who became China's first world chess champion. The match has multiple rounds. Your task is to find PGN files of the whole match, and use Stockfish to evaluate every move of every round.

For each round, show the Stockfish score for each move (i.e. the x-axis is the move number and the y-axis is the score).

Once you have the score graphs for all the games, I would like you to do some analysis of the entire Ding vs. Nepomniachtchi World Championship match. What are some of the important moments of the match? These mistakes should be clearly visible in the Stockfish score graphs.

Note: there are news reports (Chinese media, or [chess.com](https://chess.com)), and posts on social media (Twitter or Weibo) about the World Championship match made by fans and professionals. There is a lot of information out there. Use these to aid your understanding.

Once you have finished this, prepare a 10 slide presentation to introduce the game of chess and to show your findings.