History and Rules of Chess Report

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# Abstract

In this report, I will be researching and reporting my findings on the history of the game Chess as well as the rules and facts relating to the game. The reason for creating a report on the history and rules of Chess is because it will contribute to giving me a better insight into the game when programming the validation and different manoeuvres as part of my final project.

Not only will my report aid my own programming, but by researching different facts, moves, and the history of the game, it will give any reader of this report an interesting insight and potentially provide them with new knowledge relating to the game.

# Introduction

The main motivation of the topic being researched is to give myself and readers a better insight into the game, its history, and rules. This is because although Chess is a widely popular game which has existed for a very long time in history, it means there is plenty of history to talk about and several different rules, manoeuvres and facts, which most people may be unaware of and will find interesting to read about in my report below.

Another motivation for the topic of ‘The History and Rules of Chess’ being researched is due to the link/relation that Chess has in the Computer Science industry. Such examples include the development of the Deep Blue chess computer by IBM, which became the first computer chess-playing system to win a chess game against a world champion, whilst being under regular time controls. [[1]](#_Bibliography)

This was one of the first signs of Artificial Intelligence being effective and showing progress in the industry. It is my interest in this that led to my decision on what I am doing for my final year project, which is creating a Chess game and implementing Artificial Intelligence. Therefore, my research into the game is going to help with my objectives for my project. I will be researching and creating another report solely focused on Artificial Intelligence in games in the near future.

# History

Chess goes back roughly 1500 years, with the game first dating back to Northern India in the 6th century. In its earliest form in the 6th century, the game was known as Chaturanga. There were four different divisions known as the infantry, the cavalry, elephants, and chariotry. Through time, these divisions became the modern pawn, knight, bishop, and rook that we use in today’s game. [[2]](#_Bibliography)

It then spread to Persia, and subsequently Southern Europe. At roughly 1475-1500AD was the birth of the modern game that we still know at present day, with the difference being new moves for the queen and bishop compared to earlier versions of the game. Pawns gained the ability to move two squares in their first move. These modern rules were adopted by Italy and Spain. [[3]](#_Bibliography) The queen had become the most powerful piece by this time, it was decided that the player on the white side would make the starting move, and the ‘Castling’ manoeuvre was first introduced. These were the rules that were known in Western Europe when the game had spread/reached there.

During the early 19th century, the rules concerning a stalemate situation were finalised, so that a stalemate is widely recognised as a draw in the modern game. In the earlier versions, such as in chaturanga, the side who caused a stalemate would have been the winner. [[4]](#_Bibliography)Although castling was introduced in the 1500s, the rules when castling a rook and king were also finalised and become standardised. As these rules were standardised in Western Europe, this version of the game was sometimes known as Western Chess.

In terms of chess organisations and media, there were the first appearances of chess clubs, books, and journals surrounding the game. For example, in 1824, the London Chess Club played a match against the Edinburgh Chess Club. [[5]](#_Bibliography) In the mid-19th century, the game was progressing into a sport with the first chess tournament taking place in the US in 1849, and the first world championships of the game was acknowledged in 1886.

In the 20th century, there were lots of tournaments and world championships taking place. The 1948 tournament winner, Mikhail Botvinnik, was the first of many Soviet winners in competitive chess. Until the Soviet Union ended in 1991, there was only one non-Soviet winner, American Bobby Fischer, who reigned as champion for 3 years between 1972 and 1975.

In both the 20th and 21st century, there have been lots of advances in the theory of chess, leading to the development of Artificial Intelligence within chess engines (a program with the ability to play the game against a human player), as well as the development of chess databases. As briefly mentioned above, in 1996, Deep Blue was the first computer system to use Artificial Intelligence to successfully beat a world championship player in the game.

Despite computers having the ability to beat world championship chess players, modern computers cannot “solve” chess due the very large number of possible ways to play the game (see fact 9 below, regarding the amount of possible moves there are in just the first four turns in the game, let alone the whole game). A breakthrough in Quantum computing would be needed to even start attempting to solve Chess. [[6]](#_Bibliography)

# Facts About the Game and Its History

1. The most amount of moves you can make in the longest game of chess is 5,949 moves. [[7][8]](#_Bibliography)
2. The word “Checkmate” comes from the Arabic word “shah mat”, meaning “The king is dead” in English. [[7][8]](#_Bibliography)
3. The pawn’s ability to move two steps instead of one in its first go was first introduced in Spain in 1280. [[7][8]](#_Bibliography)
4. The longest time the World Chess Champion title was held for was 26 years and 337 days by a German man named Dr Emanuel Lasker. [[7][8]](#_Bibliography)
5. The chess board we know today first appeared in Europe in 1090. [[7][8]](#_Bibliography)
6. The second book which was ever printed in the English Language was about how to play Chess. [[7][8]](#_Bibliography)
7. Alan Turing developed the first computer program which was able to play chess in 1951. No computers were powerful enough to process the program, so Turing could only test it by doing calculations himself and playing in accordance to the results of each move. Each move took about several minutes. [[7][8]](#_Bibliography)
8. The first time a computer beat an international expert in the game was in November 1988, in Long Beach, California. The computer was named Deep Thought (This is not to be confused with Deep Blue which was the first computer system to beat a world champion in the game). [[7][8]](#_Bibliography)
9. The number of possible moves when playing the first four moves (for both sides) in the game is 318,979,564,000. [[7]](#_Bibliography)
10. Approximately 600,000,000 people know how to play chess across the world. [[8]](#_Bibliography)

# Basic Rules of Each Chess Piece

Pawns:

* Can move forward one square if the square is unoccupied.
* A pawn can move forwards two squares if that pawn has not moved before and both squares in front are unoccupied.
* If the squares diagonally in front of the pawn contain an opponent piece, the pawn can move one square diagonally to capture that piece.

Rooks:

* Can move any number of squares vertically or horizontally, as long as the squares are vacant.

Bishops:

* Can move any number of squares diagonally, as long as the squares are vacant.

Knights:

* Can move in an L shape in any direction. It can move two squares forwards, backwards, left or right, then one square to the left or right. Alternatively, it can move one square forwards, backwards, left or right, then two squares to the left or right.
* Knights can jump over pieces in its intended path, so the squares in its path do not have to be vacant.

Queen:

* Can move in any number of squares in all directions (horizontally, vertically, or diagonally), as long as the squares are vacant.

King:

* Can move one square at a time in all directions (horizontally, vertically, or diagonally), as long as the square is vacant. [[9]](#_Bibliography)

# Chess Manoeuvres

Castling: Castling is the only move where more than one piece can move in a single turn. When castling, the king will move two squares in the direction of the rook the king wants to castle with, the rook then moves over the king into the square the king passed.

There are two conditions which must be met before castling:

* Both the king and rook must not have moved from their original positions
* There cannot be any pieces between the king and rook when castling

En Passant: This is a move which occurs straight after a pawn (which is going to be captured) moves two squares from its starting position. To make an En Passant capture, it must be made in the next turn as you cannot do so afterwards/later on.

These are the conditions for En Passant:

* The capturing pawn must be on the 5th row/rank
* The pawn being captured must be on the same row and has just moved two squares in one move
* The capture must be made in the move after the opponent pawn moves two squares, otherwise the player cannot capture the opponent’s pawn en passant.

Pawn Promotion: This is when a pawn reaches the end of the board on the opponent’s side. The pawn can be promoted to a queen, rook, bishop or knight, and is entirely down to the player’s choice. The piece the pawn is being promoted to does not need to be a previously captured piece. [[9]](#_Bibliography)

# Check

Check is when it is possible for the opponent to attack/capture the player’s king in their next turn. Sometimes a player cannot move one of their pieces as it would put their own king into check for the opponent player, and it is illegal for the player to make a move that would put their king in check.

In informal games, it is known as common practice for the opponent to announce when they’ve put the player’s king in check. In competitive/formal games, however, the opponent does not have to announce that the player’s king is in check.

There are a few possible ways to get the king out of check:

* Moving the king to a square that cannot be moved into from an opponent player’s piece in the opponent’s next turn.
* Capture the opponent’s piece (either with the king itself or another piece).
* Block the opponent’s path to the king by placing another piece in its way.

If it is not possible for the player to get their king out of check, the king is checkmated, which means the game is now over (see ‘Winning Conditions’). [[10]](#_Bibliography)

# Winning Conditions

**Checkmate**

If a player’s king is in check and they cannot legally get their king out of check, the king is “checkmated”, meaning the opponent can capture their king and the game ends. The king is not actually removed or captured because a situation where the king is checkmated is sufficient to end the game without making a further move.

**Resigning**

A player can resign at any point during the game, which means their opponent would win. A player would usually resign when they think that they are highly likely to lose the game and would be pointless continuing. They can indicate their resignation by simply saying they resign from the game.

**Draw**

A draw means there is no conclusive winner or loser in a game. It can occur in the following conditions:

1. In a stalemate, which is when the player is not in check but cannot make a legal move.
2. When it is not possible to checkmate for both the player and their opposition with any legal move. This can happen when there are insufficient pieces, or the existing pieces are unable to make a move to put a king in checkmate. These scenarios can occur with the following combination of pieces:
   * King against King
   * King against King and Bishop
   * King against King and Knight
   * King and Bishop against King and Bishop (where both Bishops are squares of the same colour)
3. When both players agree to draw when one of the players offers to draw.

**Time Control**

This can happen in a competitive game where a player under time control can run out of their allocated/specified time limit to make a move, thus ending in a loss for the player and win for their opponent. [[11]](#_Bibliography)

# Bibliography

1. ***Deep Blue Chess Computer - Wikipedia***

<https://en.wikipedia.org/wiki/Deep_Blue_(chess_computer)>

This resource contained information in the chess-playing computer named “Deep Blue”, which beat the first Chess world championship under time controls.

1. ***History of Chess - Wikipedia***

<https://simple.wikipedia.org/wiki/History_of_chess>

This article on the history of chess was very useful in researching the origins of the game, as well as where the game has spread to throughout the world and the advancements of the game throughout its history.

1. ***Calvo, Ricardo (1998) “Valencia Spain: The Cradle of European Chess”***

<http://history.chess.free.fr/papers/Calvo%201998.pdf>

This report was useful in establishing the progression of Chess through time. It covered new rules adopted in Europe during the 15th century, where the research from this has featured in my “History” section of my report above.

1. ***History of the Stalemate Rule – Wikipedia***

<https://en.wikipedia.org/wiki/Stalemate#History_of_the_stalemate_rule>

This web resource provided information on the Stalemate rule, as the rule has changed from the game in its early days to how we know the game today and depending on the version of the game you play.

1. ***The Chess Games of the London Chess Club – London Chess Club***

<https://www.chessgames.com/perl/chessplayer?pid=80740>

Information from this website contained the results from the earliest examples of competitive chess play in the game’s history, where the London Chess Club played against the Edinburgh Chess Club.

1. ***“Is Chess a Solved Game?” – Chess Stack Exchange***

<https://chess.stackexchange.com/questions/13522/is-chess-a-solved-game>

This forum post was interesting as it gave insight into different answers as to whether Chess is a solved game or not. This helped to conclude, based on the extreme number of possible moves in the game, that it would be difficult to “solve” Chess unless we had a breakthrough in Quantum computing which would be needed to even attempt to solve the game.

1. ***“Chess Facts” – OhFact!***

<https://ohfact.com/chess-facts/>

See reference 8.

1. ***“40 Facts About Chess Most People Don’t Know” - TheChessWorld***

<https://thechessworld.com/articles/general-information/40-facts-about-chess-most-people-dont-know/>

Resources 7 and 8 provided an interesting insight into facts about chess and its history which most people are unaware of. The two websites have enabled me to gain a higher level of understanding of the game during my research of the game.

1. ***Chess Setup and Rules***

<http://www.chesscoachonline.com/chess-articles/chess-rules>

By researching the rules on this website, I have gained a much better understanding of all the rules and conditions for each piece and move, which will be useful for programming these into my chess game. Furthermore, it taught me about the ‘En Passant’ move, which is a move I wasn’t aware of until now and means I can implement this into my game now I have researched and am aware of this type of manoeuvre.

1. ***Rules of Chess – Check***

<https://en.wikipedia.org/wiki/Rules_of_chess#Check>

This resource helped to determine situations when a king is in check, and when a king is checkmated. This will be helpful when programming my king class.

1. ***Rules of Chess – End of the Game***

<https://en.wikipedia.org/wiki/Rules_of_chess#End_of_the_game>

This final reference included different circumstances when the game has ended or could end. Whilst I knew about checkmate and stalemate situations, by researching the circumstances on the link above I have learnt about time control and resignation as two other ways the game can end, and can now program these into the game.