

CS 101 PROJECT

The Best Of

Shatranj

PRESENTED BY:

LAB BATCH 15

MONDAY

The Teams

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Introduction To The Game Chess

Chess is a two-player board game played on a chessboard, a square-checkered board with 64 squares arranged in an eight-by-eight grid. Each player begins the game with sixteen pieces: one king, one queen, two rooks, two knights, two bishops, and eight pawns. The object of the game is to checkmate the opponent's king, whereby the king is under immediate attack (in "check") and there is no way to remove or defend it from attack on the next move. The game's present form emerged in Europe during the second half of the 15th century, an evolution of an older Indian game, Shatranj. Theoreticians have developed extensive chess strategies and tactics since the game's inception. Computers have been used for many years to create chess-playing programs, and their abilities and insights have contributed significantly to modern chess theory. One, Deep Blue, was the first machine to beat a reigning World Chess Champion when it defeated Garry Kasparov in 1997.

The tradition of organized competitive chess started during the 16th century. The first official World Chess Champion, Wilhelm Steinitz, claimed his title in 1886; the current World Champion is Viswanathan Anand from India. In addition to the World Championship, there is also the Women's World Championship, the Junior World Championship, the World Senior Championship, the Correspondence Chess World Championship, the World Computer Chess Championship, and Blitz and Rapid World Championships. The Chess Olympiad is a popular competition among teams from different nations. Online chess has opened amateur and professional competition to a wide and varied group of players. Chess is a recognized sport of the International Olympic Committee and international chess competition is sanctioned by the FIDE. Today, chess is one of the world's most popular games, played by millions of people worldwide at home, in clubs, online, by correspondence, and in tournaments.

Rules Of The Game

Chess is played on a square board of eight rows. The colours of the sixty-four squares alternate and are referred to as "light squares" and "dark squares". The chessboard is placed with a light square at the right hand end of the rank nearest to each player, and the pieces are set out as shown in the diagram, with each queen on its own colour.

The pieces are divided, by convention, into white and black sets. The players are referred to as "White" and, "Black" and each begins the game with sixteen pieces of the specified colour. These consist of one king, one queen, two rooks, two bishops, two knights, and eight pawns.

Movement

White always moves first. After the initial move, the players alternately move one piece at a time. Pieces are moved to either an unoccupied square or one occupied by an opponent's piece, capturing it and removing it from play. All pieces capture opponent's pieces by moving to the square that the opponent's piece occupies. If the player to move has no legal moves, the game is over; it is a checkmate —if the king is under attack.

Each chess piece has its own style of moving.

The king moves *one* square in any direction,

The rook can move any number of squares along any rank or file, but may not leap over other pieces.

The bishop can move any number of squares diagonally, but may not leap over other pieces.

The queen combines the power of the rook and bishop and can move any number of squares along rank, file, or diagonal, but it may not leap over other pieces.

The knight moves to any of the closest squares that are *not* on the same rank, file, or diagonal, thus the move forms an "L"-shape two squares long and one square wide. The knight is the only piece that *can* leap over other pieces.

The pawn may move forward to the unoccupied square immediately in front of it on the same file, or on its first move it may advance two squares along the same file provided both squares are unoccupied, or it may move to a square occupied by an opponent's piece, which is diagonally in front of it on an adjacent file, capturing that piece.

User Manual To The Game

The game is simple to handle. One needs to have a general idea of playing chess. The user needs to click the piece he/she wants to move and then the user needs to click on the position he/she wants the piece to move.

If the move is invalid then the computer doesn't allow that move. If the move is valid the piece will automatically move to that position.

Remember there is no undo allowed in the game of chess. So once the move has been done you cannot take it back. Think well before making the move. Also there is one touch move rule that is if you touch a piece you need to move that piece. You cannot select another one.

Have fun and enjoy.

Disclaimer: The game does not contain all the rules of chess. It doesn't have en passant and castling rule.

Making Of The Best Of Shatranj

On coming to know that we need to make a project for CS101 we decided to pursue Pocket Tanks as our project. But on giving second thoughts we decided to do something different. Hence we decided to take chess as our project.

Hence we started our work on chess.

Allotted work:

Algorithm & Coding for King: Kartikeya Datt, Kanad Daganokar

Algorithm & Coding for Knight & SRS Documentation: Rishi Agrawal

Algorithm & Coding for Pawn: Karunesh Jigyasu , Manoj Kumar

Algorithm & Coding for Rook: Rohit Mulchandani , Nitish Agarwal

Algorithm & Coding for Bishop: Prateek Agney , Shah Jainik Chetan

Algorithm & Coding for Queen: Suryakanth Agarwal,

Aeshala Vamshi Krishna

Function to return the centre of the square on which the player has Clicked the mouse: Mohammed Abdul Rawoof Shaik

SRS Documentation & Piece of Code to

Write for The Chessboard: Vallurupalli Kavya

Limitations of the project

The major limitations of our projects are as follows:

1. Our game does not include en passant rule. The rule was becoming very difficult to be encoded. Our time limitation restricted us from doing the same.
2. It does not include castling. Time limitation restricted us from doing the same.
3. It does not include pawn promotion. The reason being the same.
4. Also we were not able to add the check for king's check move i.e. a player can move his piece only if because of his movement the king does not face any threat from the opponent's piece.

Important NOTE: Our project is still not in working condition because of some logical errors in our program due to which the pieces are not being able to move. Also due to limitation of time we are not in a position to rectify the same.

Concepts Used

The main concepts used in our programming were that of the classes, inheritance, constructors and constructor overloading, EzWindows.

Like we created a class ***newpos*** which was publically inherited from the class **Position**. This included a data member ***checkstatus*** for checking whether the positions are occupied by a friend a foe or is empty

We formed different classes for the movement of different pieces in which we made many member functions and also many data members.

The common data members and functions to all the classes are as follows:

1. Data member ***life***. This was made to know whether the white knight is alive or if it is dead.

2. We created two arrays namely ***validmoves*** and ***possiblemov*** using the class ***newpos***.

Possiblemov was made to store all the possible moves of a piece.

The array ***validmoves*** was created to store the valid moves of a piece at a given condition. This made the use of ***checkstatus***.

3. We created the function ***void initilaise*** so as to initialise all the possible movements of a piece.

4. The function ***checkposition*** was made to check if the possible movements of the piece are valid or not.
5. Function ***validate*** was made to store the valid moves in the array valid moves.
6. Function ***compare*** was made to check if the click made lies in the valid moves or not.

We created global arrays ***whitepiececentre*** & ***blackpiececentre*** to store the centres of the pieces.

We created a global function ***chessboard*** that created the board and initialised the pieces.

We created a global function ***assigncentres*** that assigned the centres of all the pieces to the arrays.

We also created a function ***givepiece*** that returns the value of the click made and if the move is possible.

Bibliography

- 1. Cohoon And Davidson**
- 2. Tutorial Programs provided by CS101 course instructor Dr. Deepak Phatak**
- 3. Sample Programs of EzWindows**