Use Case: Play Match

## **Brief Description**

The goal of this use case is to play a chess match. The player tells the system what type of match they wish to play. The system finds them an opponent if necessary. The system starts the match. Each participant takes turns making moves until a match ending condition occurs. The result of the match is shown to the participants and the use case ends.

# **Included Use Cases**

N/A

# **Preconditions**

N/A

# **Flow of Events**

## **Basic Flow –** **A chess match is played.**

1. This use case begins when the player tells the system they want to start a match with a selected mode of play. See Appendix A for data definition.
2. The system matches up the player with an opponent based on the mode of play selected.
3. The system randomly determines the color of the participants so that one is white and the other is black.
4. The system presents the chessboard with pieces in starting position. See Appendix B to learn more about chessboard, chess pieces, and starting positions.
5. The participant who’s turn it is[[1]](#footnote-2) inputs a turn. See Appendix A for the data definitions.
6. The system validates the turn, moves the pieces, and updates the match clock. See Appendix D for a decision table for checking the validity of a turn.
7. The system shows the user the changes that took place during the turn.
8. Steps 5 to 7 (inclusive) repeats until a game ending condition occurs. See Appendix C for a decision table for game ending condition detection.
9. The match result is presented to the participants.
10. The use case ends.

## **Alternative Flows**

None

## **Exception Flows**

E1: A play mode that requires being logged in is selected when logged out

1. This flow begins when the system determines that the play mode is not allowed. Reference: basic flow step 1.
2. The system presents a message telling the user that the selected mode of play is not allowed while logged out and offers to start the login process.
3. The use case ends.

E2: A play mode that requires internet access is selected when the internet cannot be reached

1. This flow begins when the system determines that the play mode is not allowed. Reference: basic flow step 1.
2. The system presents a message telling the user that the selected mode of play is not allowed while offline.
3. The use case ends.

E3: Invalid turn received.

1. This flow begins when the system determines that an invalid move was received from a remote opponent. Reference: basic flow step 7.
2. The system will generate a report of the invalid move and send it to the server if the match was an online match. See Data Definition.
3. The system will notify the user about the invalid move and end the match.
4. The use case ends.

# **Requirements**

## Playability

### The match must observe all basic rules of chess as outlined in the FIDE Handbook’s Laws of Chess taking effect from 1 January 2018 available at <https://handbook.fide.com/chapter/E012018>.

### Captured pieces must be observable to the player(s)

### The player must be able to pick their pawn promotion choice, or default to queening based on a preference value.

### The player must be able to review and modify their move before deciding to commit in case of accidental input or have move inputs automatically commit based on a preference value.

### The player must be able to resign from a match regardless of who’s move it is.

### The player must be able to request a draw when it is their move.

### The player(s) must be able to observe the result of a match upon its conclusion.

## Usability

### The UI must be intuitive enough that an untrained individual should be able to interact effectively with the system without any external documentation or assistance.

### The UI must be responsive with no UI unresponsiveness greater than 500 milliseconds.

## Interoperability

### Any information that will be sent to other clients or the server must be convertible to and from JSON.

## Speed

### The time it takes for a turn to be sent by a player and received and processed by the opponent must not exceed 1 second.

### The time it takes for an AI opponent to make a move must not exceed a configurable max time.

### The time it takes for the system to be in a state capable of accepting the turn of the white participant after an opponent is decided must be under 5 seconds.

## Security

### The system must require authentication to play online matches.

### The system must verify the authenticity of each request to the server.

### All data transmitted will be encrypted.

# **Post-conditions**

N/A

# **Notes & Open Issues**

## List of things to add, remove, or modify in this document

* Additional information about match clocks needs to be added.
* Decision table for legality of castle moves is missing
* A table showing the correlation between match mode, available match clocks, and other related information could be useful.

## Dead State Detection Concerns

I expect that the resource complexity of true dead-state detection will make it infeasible to implement. We can just have our system assume that dead-states never happen and rely on players agreeing to draw in the event of a dead-state. If all else fails, the 50/75-move rules and repetition draw rules should force a draw eventually if a dead-state occurs. -JZ.

## Discrepancies between the use case and the current implementation of the system.

### 50/75 move rule and repetition draws are not implemented yet.

### Turn validation is not implemented yet.

### Match clock sync tolerance not correctly configured yet.

### Online matches don’t work correctly yet.

### AI matches crash.

# **Out of Scope (Future Functionality)**

## Suspending Matches

### When resigning from or agreeing to draw matches, the player will be given the option to save the match to be resumed later.

### Matches that have been saved in this manner must be resumable with AI and Local Multiplayer.

## Saving Historical Matches

### When a match ends, the system will give the player the option to save a match as a historical match to be reviewed later.

## Progression

### When the player completes a match, points should be awarded to the player based on the result of the match and the type of match played.

# **Appendix A – Data Definitions**

# Mode of Play Data Definition.

| **Field Name** | **Description** | **Type** | **Valid Values** | **Default** | **Business Rules** |
| --- | --- | --- | --- | --- | --- |
| Mode of Play | The way the match is played | Choice | Single player,  Local Multiplayer,  Online Multiplayer | N/A | Online modes require being logged in to an account and having internet access. |
| AI difficulty | The difficulty of the artificial intelligence opponent of a single player match | Choice | Easy,  Hard. | N/A |  |

# Turn Data Definition

| **Field Name** | **Description** | **Type** | **Valid Values** | **Default** | **Business Rules** |
| --- | --- | --- | --- | --- | --- |
| Elapsed Time | The amount of time in milliseconds that it takes for the participant to make the turn. | Number | Any Non-Negative Number | N/A | The reported elapsed time must be withing tolerance[[2]](#footnote-3) of what is recorded by the other client in online matches, but if within tolerance, the reported elapsed time will be used to adjust the match clock. |
| Move | The move that is made during the turn. | Move (see Data Definition 3) | Any valid Move | N/A |  |
| Color | The color of the piece that moves during the turn. | Color | White,  Black | N/A |  |
| Promotion Choice | The promotion choice made during the turn | Choice | Promote to Rook,  Promote to Knight,  Promote to Bishop,  Promote to Queen | Promote to Queen | When a Move during this turn will result in a pawn getting moved to rank 1 or 8, the participant who is making the move must pick a promotion choice (or use the default choice). A turn can and should otherwise have no promotion choice. |

# Move Data Definition

| **Field Name** | **Description** | **Type** | **Valid Values** | **Default** | **Business Rules** |
| --- | --- | --- | --- | --- | --- |
| movements | A collection of piece movements that make up the move. | Collection of Piece Movements | A collection of 1 or 2 valid Piece Movements | N/A | The only valid Move that has 2 movements is a castle move in chess. |

# Piece-Movement Data Definition

| **Field Name** | **Description** | **Type** | **Valid Values** | **Default** | **Business Rules** |
| --- | --- | --- | --- | --- | --- |
| Origin | The position of the moving chess piece before the move is made. | Chess Coordinate | Any Valid Chess Coordinate | N/A |  |
| Destination | The position that the moving chess piece will be after the move is made | Chess Coordinate | Any Valid Chess Coordinate not equal to the Origin | N/A |  |

# Chess Coordinate Data Definition

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Field Name** | **Description** | **Type** | **Valid Values** | **Default** | **Business Rules** |
| File | The file of the coordinate. See Appendix B – Chess Primer for a definition of a file in chess. | Letter | a,  b,  c,  d,  e,  f,  g,  h | N/A |  |
| Rank | The rank of the coordinate. See Appendix B – Chess Primer for a definition of a rank in chess. | Number | 1,  2,  3,  4,  5,  6,  7,  8 | N/A |  |

# **Appendix B – Chess Primer**

# Our default source of rules knowledge

When guidance is required regarding rules knowledge, our default source is the [FIDE Laws of Chess Taking Effect from 1 January 2018](https://handbook.fide.com/chapter/E012018).

# Goal of the game

To put the opponent’s king into checkmate, a condition where the opponent’s king is threatened to be captured if no action is taken, but no legal move could prevent the king from being taken on the next turn.

# Winning Conditions

* Place the opponent in checkmate.

# Losing Conditions

* Run out of time on the match clock.
* Resign from a match

# Draw Conditions

* Both participants agree to end the match in a draw
* A stalemate occurs.
* It is determined that neither participant can possibly checkmate the opponent’s king with any series of legal moves.
* 50 moves have been made by each player since the last movement of a pawn or capturing of any piece and a draw is requested, or 75 moves have been made by each player since that last movement of a pawn or capturing of a piece.
* Repeated positions occur 5 times, or the 3 times and a draw is requested.

# Overview of a chessboard

A chess board is a square divided into an 8x8 grid. The colors of the squares that make up the grid alternate between white (light colored) and black (dark colored).

In chess, a coordinate system is used to describe the position on the board. Each coordinate has a letter representing the file (corresponding to columns) and a rank (corresponding to rows). The following diagrams show the coordinates of each square on a chessboard where the white pieces’ starting position is at the bottom (rank 1 and 2). The first diagram shows the coordinates as files and ranks, while the second shows the column and row value of each square.

Chessboard Coordinates given as file and rank

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ↑ Black Stating Side ↑ | | | | | | | |
| a8 | b8 | c8 | d8 | e8 | f8 | g8 | h8 |
| a7 | b7 | c7 | d7 | e7 | f7 | g7 | h7 |
| a6 | b6 | c6 | d6 | e6 | f6 | g6 | h6 |
| a5 | b5 | c5 | d5 | e5 | f5 | g5 | h5 |
| a4 | b4 | c4 | d4 | e4 | f4 | g4 | h4 |
| a3 | b3 | c3 | d3 | e3 | f3 | g3 | h3 |
| a2 | b2 | c2 | d2 | e2 | f2 | g2 | h2 |
| a1 | b1 | c1 | d1 | e1 | f1 | g1 | h1 |
| ↓ White Stating Side ↓ | | | | | | | |

Chessboard Coordinates given as column and row

|  |  |  |  |  |  |  |  |
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| ↑ Black Stating Side ↑ | | | | | | | |
| 0,0 | 1,0 | 2,0 | 3,0 | 4,0 | 5,0 | 6,0 | 7,0 |
| 0,1 | 1,1 | 2,1 | 3,1 | 4,1 | 5,1 | 6,1 | 7,1 |
| 0,2 | 1,2 | 2,2 | 3,2 | 4,2 | 5,2 | 6,2 | 7,2 |
| 0,3 | 1,3 | 2,3 | 3,3 | 4,3 | 5,3 | 6,3 | 7,3 |
| 0,4 | 1,4 | 2,4 | 3,4 | 4,4 | 5,4 | 6,4 | 7,4 |
| 0,5 | 1,5 | 2,5 | 3,5 | 4,5 | 5,5 | 6,5 | 7,5 |
| 0,6 | 1,6 | 2,6 | 3,6 | 4,6 | 5,6 | 6,6 | 7,6 |
| 0,7 | 1,7 | 2,7 | 3,7 | 4,7 | 5,7 | 6,7 | 7,7 |
| ↓ White Stating Side ↓ | | | | | | | |

# Overview of Chess Pieces and Their Movements

* There are 6 types of chess pieces: king, queen, rook, bishop, night, pawn.
* Each piece has a color of black or white

The following diagram shows the starting positions on the chessboard:

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| ↑ Black Stating Side ↑ | | | | | | | |
| RB | NB | BB | QB | KB | BB | NB | RB |
| PB | PB | PB | PB | PB | PB | PB | PB |
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|  |  |  |  |  |  |  |  |
| PW | PW | PW | PW | PW | PW | PW | PW |
| RW | NW | BW | QW | KW | BW | NW | RW |
| ↓ White Stating Side ↓ | | | | | | | |

Key

|  |  |  |
| --- | --- | --- |
|  | Black | White |
| King | KB | KW |
| Queen | QB | QW |
| Bishop | BB | BW |
| Knight | NB | NW |
| Rook | RB | RW |
| Pawn | PB | PW |

Each type of piece has at least one movement pattern that describes legal movements of the piece. It is illegal to move a piece to a destination that is occupied by a piece of the same color. The normal movement of a knight, and the second movement in the castle move are jumps[[3]](#footnote-4), and all other movements are slides[[4]](#footnote-5). A movement is capable of but does not require the capturing of a piece unless noted otherwise. Normal capturing occurs when a move is made where the destination of a movement is occupied by a piece of non-moving color. Before the moving piece is moved, the captured piece is taken off the board and placed with other captured pieces.

The diagrams that follow show these movement patterns where forward movement is represented with upward movement on the diagram. S represents the starting position of the moving piece, and D represents possible destination positions.

Pawn Normal Movement:

* This movement is incapable of capturing

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Pawn Doble Movement:

* This movement is incapable of capturing
* This movement can only be made by a piece that has not moved and is in starting position.
* When this movement is used, the piece has a special vulnerability at the square marked with a v. This vulnerability allows the capturing of the pawn at location D by another pawn of the opposite color on the following move if that attacking pawn uses a capture movement to position itself in the location marked with v. See 3.7.4 in the FIDE [Laws of Chess taking effect from 1 January 2018](https://handbook.fide.com/chapter/E012018).

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|  |  |  |  |  |  |  | D |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  | v |  |  |  |  |  |  |  |
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Pawn Capture Movement:

* This movement can only be made when capturing.

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Rook Normal movement:

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Knight Normal movement:

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Bishop Normal movement:

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King Normal Movement:

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|  |  |  |  |  |  | D | S | D |  |  |  |  |  |  |
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Queen Normal movement:

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Castle Move:

* This is only move that has more than one piece-movement. The king slides two spaces towards one of the rooks, and the rook that the king moved towards jumps over the king to the square on the opposite side of the king from where the rook was.
* Prerequisites:
  + The king must not be in check before, during, or after the move. That is to say that the starting position, ending position, and all squares between them must not be threatened by an opponent’s piece.
  + The king and moving rook must be in starting position and unmoved.
  + There must be no pieces between the king and the moving rook.
* The first movement is a movement by the king, and since the king’s only movement pattern that would place the king in the resulting position is part of a particular castle movement, once this movement is made, the player must complete that castle move unless they resign or draw before competition of the move.

On the following page, there are diagrams showing the movement patterns of the king and moving rook for the 4 possible castle moves where SK is the starting position of the king, DK is the destination location of the king, SR is the starting position of the moving rook, and DR is the destination location of the rook.

Black Queenside:

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| SR |  | DK | DR | SK |  |  |  |
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| ↓ White Stating Side ↓ | | | | | | | |

White Queenside:

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| ↑ Black Stating Side ↑ | | | | | | | |
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|  |  |  |  |  |  |  |  |
| SR |  | DK | DR | SK |  |  |  |
| ↓ White Stating Side ↓ | | | | | | | |

Black Kingside:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ↑ Black Stating Side ↑ | | | | | | | |
|  |  |  |  | SK | DR | DK | SR |
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|  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
| ↓ White Stating Side ↓ | | | | | | | |

White Kingside:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| ↑ Black Stating Side ↑ | | | | | | | |
|  |  |  |  |  |  |  |  |
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|  |  |  |  |  |  |  |  |
|  |  |  |  | SK | DR | DK | SR |
| ↓ White Stating Side ↓ | | | | | | | |

# Overview of the Match Clock:

## Increment Clocks

### Main thinking time

The main thinking time is the total amount of time that the player starts with for thinking time.

### Increment Time

The increment time is an amount to time that is added to the main thinking time each turn. This time is not added if flag fall occurs before the turn ends.

### Classic FIDE Clock

* 90 minutes main thinking time for the first 40 moves
* 30 minutes main thinking time for the rest of the game after the first 40 moves
* Increment of 30 seconds starting on the first turn.

## Casual Clock

This is a simple clock that just tracks a participant’s total thinking time. Players should never run out of time with this clock.

# **Appendix C: Game Ending Conditions Decision Table**

This table shows the match result required when game ending conditions are checked. For conditions, X indicates that a condition is detected, \* indicates the condition need not be checked, and nothing in the cell indicates that the condition is not detected. Note: dead-state detection has been removed. See note 7.2 in the Notes & Open Issues section for details.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Game Ending Condition** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Invalid turn received | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A participant resigns | \* | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| The positions have repeated[[5]](#footnote-6) 5 or more times | \* | \* | X |  |  |  |  |  |  |  |  |  |  |  |  |  |
| The positions will be repeated 5 or more times if a legal move is made this turn | \* | \* | \* | X |  |  |  |  |  |  |  |  |  |  |  |  |
| The moving participant starts turn in check | \* | \* | \* | \* | X |  | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* |
| The moving participant starts turn with no legal moves | \* | \* | \* | \* | X | X |  |  |  |  |  |  |  |  |  |  |
| 75 moves by each player have been made without the movement of a pawn | \* | \* | \* | \* | \* | \* | X |  |  |  |  |  |  |  |  |  |
| 75 moves by each player have been made without the capturing of a piece | \* | \* | \* | \* | \* | \* | \* | X |  |  |  |  |  |  |  |  |
| The moving player runs out of time | \* | \* | \* | \* | \* | \* | \* | \* | X |  |  |  |  |  |  |  |
| The positions have repeated 3 or more times | \* | \* | \* | \* | \* | \* | \* | \* | \* | X |  |  |  |  |  | \* |
| The positions will be repeated 3 or more times if a legal move is made this turn | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | X |  |  |  |  | \* |
| 50 moves by each player have been made without the movement of a pawn | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | X |  |  |  | \* |
| 50 moves by each player have been made without the capturing of a piece | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | X |  |  | \* |
| The moving player requests a draw | \* | \* | \* | \* | \* | \* | \* | \* | \* | X | X | X | X | X | X |  |
| Non-moving participant agrees to draw. | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | X |  | \* |
| **Match Result** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| << no result, match continues>> |  |  |  |  |  |  |  |  |  |  |  |  |  |  | X | X |
| Invalid Turn Result | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Checkmate Result |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |  |
| Resignation Result |  | X |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Timeout Result |  |  |  |  |  |  |  |  | X |  |  |  |  |  |  |  |
| Stalemate Result |  |  |  |  |  | X |  |  |  |  |  |  |  |  |  |  |
| Agreed Draw Result |  |  |  |  |  |  |  |  |  |  |  |  |  | X |  |  |
| Repetition Draw |  |  | X | X |  |  |  |  |  | X | X |  |  |  |  |  |
| Fifty Move Rule Draw |  |  |  |  |  |  |  |  |  |  |  | X | X |  |  |  |
| Seventy-five Move Rule Draw |  |  |  |  |  |  | X | X |  |  |  |  |  |  |  |  |
| **Result Type** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Win-Loss |  | X |  |  | X |  |  |  |  |  |  |  |  |  |  |  |
| Draw |  |  | X | X |  | X | X | X | X | X | X | X | X | X |  |  |

# **Appendix D: Turn Validity Decision Table**

This table shows the validity of the turn given various conditions. For conditions, X indicates that a condition is checked and true, \* indicates the condition need not be checked, and nothing in the cell indicates that the condition is checked and not true.

|  |  |  |  |
| --- | --- | --- | --- |
| **Validity Condition** |  |  |  |
| The move is legal (see Appendix E) |  | X | X |
| The reported elapsed time is withing 1 second of what was expected. | \* |  | X |
| **Validity Results** |  |  |  |
| Turn is Valid |  |  | X |
| Turn is Invalid | X | X |  |

# **Appendix E: Move Legality Decision Tables**

These tables show the legality of a move given various conditions. For conditions, X indicates that a condition is checked and true, \* indicates the condition need not be checked, and nothing in the cell indicates that the condition is checked and not true.

Legality of Non-Castle Moves Decision Table:

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Legality Condition** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| A piece of the mover’s color is not located at the origin coordinate on the chessboard before move is made | X |  |  |  |  |  |  |  |  |  |  |  |  |  |
| There is no movement pattern for the piece that is located at the origin coordinate before the move is made that would result in that piece being moved to the destination coordinate after the move was made. | \* | X |  |  |  |  |  |  |  |  |  |  |  |  |
| The movement pattern is only valid for pieces that are in starting position and have not been moved, and the piece at the origin location has moved or is not in starting position. | \* | \* | X |  |  |  |  |  |  |  |  |  |  |  |
| The movement pattern is a slide and there are pieces blocking the slide path to the destination | \* | \* | \* | X |  |  |  |  |  |  |  |  |  |  |
| There is a piece of the moving color at the destination coordinate before the move is made | \* | \* | \* | \* | X |  |  |  |  |  |  |  |  |  |
| There is a piece of the non-moving color at the destination coordinate before the move is made | \* | \* | \* | \* | \* | X | X | X |  |  |  |  |  |  |
| The movement pattern[[6]](#footnote-7) is invalid if capturing | \* | \* | \* | \* | \* | X |  |  | \* | \* | \* | \* | \* | \* |
| The movement pattern is only valid if capturing | \* | \* | \* | \* | \* | \* | \* | \* |  |  | X | X | X | X |
| A pawn is located at the origin coordinate before a move is made | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* |  | X | X | X |
| The destination coordinate is vulnerable to en passant capture | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* | \* |  | X | X |
| The mover’s king would be in check after move is made. | \* | \* | \* | \* | \* | \* | X |  | X |  | \* | \* |  | X |
| **Legality Results** |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Move is Legal |  |  |  |  |  |  |  | X |  | X |  |  | X |  |
| Move is Illegal | X | X | X | X | X | X | X |  | X |  | X | X |  | X |

Legality of Castle Moves Decision Table:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Legality Condition** |  |  |  |  |  |  |  |
| The moving king has moved or is not in stating position | X |  |  |  |  |  |  |
| The moving rook has moved or is not in starting position | \* | X |  |  |  |  |  |
| The moving player is in check before the move | \* | \* | X |  |  |  |  |
| The moving player would be in check after the move | \* | \* | \* | X |  |  |  |
| If the moving king moved only one space in the direction of the moving rook, the moving player would be in check after that move. | \* | \* | \* | \* | X |  |  |
| There is any piece between the moving king and the moving rook | \* | \* | \* | \* | \* | X |  |
| **Legality Results** |  |  |  |  |  |  |  |
| Move is Legal |  |  |  |  |  |  | X |
| Move is Illegal | X | X | X | X | X | X |  |

1. The participant playing white moves first, and each turn after that the moving color alternates between black and white. [↑](#footnote-ref-2)
2. The tolerated difference in reported and recorded elapsed time is 1second. [↑](#footnote-ref-3)
3. Jumps are not blocked if a piece is between the origin and the destination of the movement. [↑](#footnote-ref-4)
4. Slides are movements that take a direct path (diagonal or straight) from the origin to the destination of the movement. Slides can be blocked by any piece located along the slide path. [↑](#footnote-ref-5)
5. See 9.2.2 in the FIDE [Laws of Chess taking effect from 1 January 20018](https://handbook.fide.com/chapter/E012018). [↑](#footnote-ref-6)
6. The movement pattern that would allow the piece located at the origin before the move to end up located at the destination after the move. [↑](#footnote-ref-7)