



# Forsyth-Edwards Notation FEN in Chess

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# Chapter 1

## Forsyth-Edwards Notation FEN in Chess

### 1.1 Chess notation

Two chess notations are primarily available. They are [Forsyth-Edwards Notation \(FEN\)](#) and [Portable Game Notation \(PGN\)](#). Fen is used to define a status of a chess game and PGN is used to define the entire game from beginning. FEN is explained here. Detailed explanation of [pgn](#) is given [here](#).

### 1.2 Forsyth-Edwards Notation (FEN)

FEN is characterised by a single line of ascii characters. FEN has [six fields](#) separated by a space as shown in the Fig. [fen infographics](#).

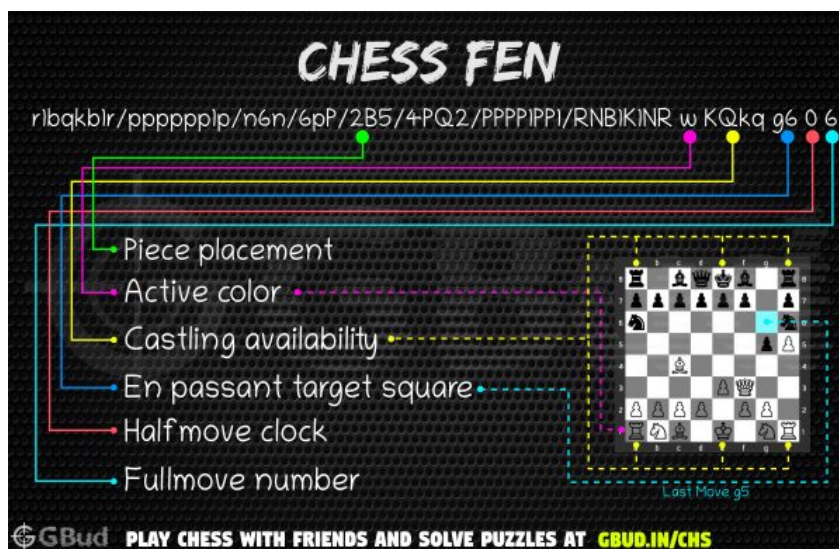


Figure 1.1: Infographics of Forsyth-Edwards Notation (FEN)

[Download](#) the large size pdf file of this infographics on FEN at the [chess FEN chart](#) page.

## 1.2.1 Fields of FEN

1. Piece placement
2. Active color
3. Castling availability
4. En passant target square
5. Halfmove clock
6. Fullmove number

## 1.2.2 Piece placement

FEN starts from the h1 square from white players perspective. Each set of blank squares are clubbed to a number which indicates the number of continuous empty squares. For example sixth rank at the initial board setup is defined as `/8/` (FEN : `rnbqkbnr/pppppppp/8/8/8/8/PPPPPPPP/RNBQKBNR w KQkq - 0 1`) and four empty squares followed by four pawns on second rank is defined as `/4PPPP/` (FEN : `r1bqkb1r/pp1pppp1/n1p2n1p/8/P1PP4/1P6/4PPP w KQkq - 0 1`).

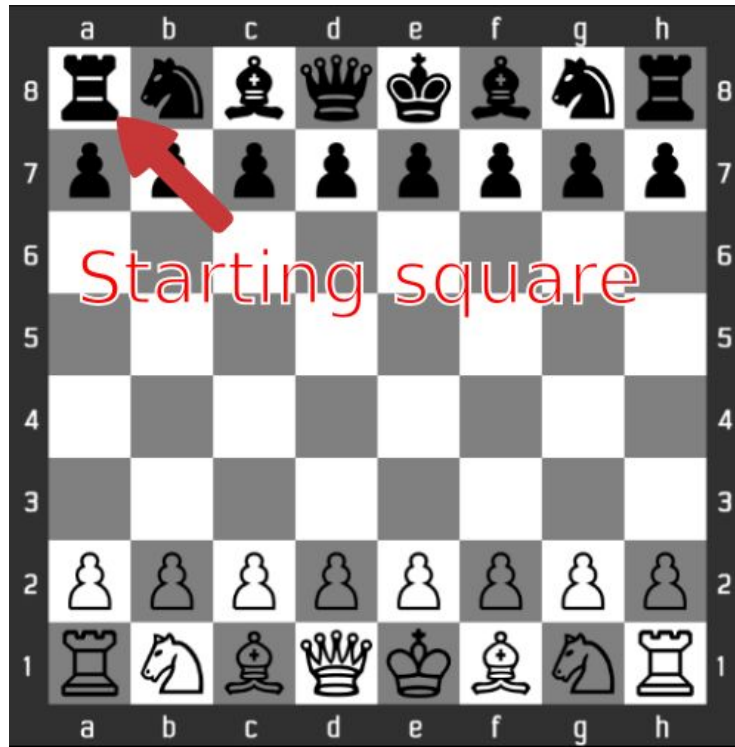


Figure 1.2: Starting square of fen



Figure 1.3: Continuous empty squares at fen



Figure 1.4: Continuous four empty squares at fen

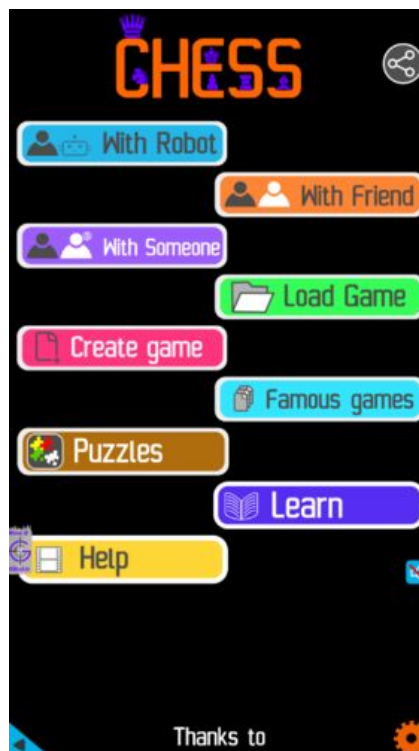


Figure 1.5: Play chess online for free. Solve puzzles and play with friends

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We present you a platform to [play chess online with friends for free](#). No need to install any app or no login is required. Simple. You can [solve puzzles](#), [learn about chess](#), [play with computer](#), [play with friend](#), [create your own chess games](#), use it as a [fen viewer](#), [fen editor](#), [fen generator](#), [pgn viewer](#), [chess board editor](#) or [view famous chess games](#).

### 1.2.3 Piece identification in FEN

Each [piece](#) id identified by a letter as given below

- K - [King](#)
- Q - [Queen](#)
- R - [Rook](#)
- N - [Knight](#)
- B - [Bishop](#)
- P - [Pawn](#)

Lower case letters are for black pieces and upper case letters are for white pieces. Each [rank](#) is separated by a backward slash /.

Example : r3k2r/ p1pppppp/ n7/ 8/ 8/ 8/ P2PPPpP/ R3K2R w KQkq - 0 5

### 1.2.4 Active color

Second field indicates who will [move](#) next. w is for white player and b is for black player.

Example :

- r1b1k2r/pp3ppp/5b2/K2p1n2/2N5/4nN2/Pp4qP/8 w kq - 8 21 -  
White to move next
- 1k1r3r/pp4pp/8/2pp1pq1/8/P7/PRP2P1P/1Q3R1K b - - 0 18 -  
Black to move next

### 1.2.5 Castling availability

Third field indicates the availability of [castling](#) for white player followed by the availability of castling for black player. A total of [sixteen possibilities](#) exist for castling availability

King side castling is identified by the letter K for white and k for black. Queen side castling is identified by Q for white and q for black.



### 1.2.5.1 Possibilities of castling availability in FEN

1. **KQkq** - Both King side and Queen side castling are possible are both white and black players
2. **KQk** - King side and Queen side castling for white and King side castling for black
3. **KQq** - King side and Queen side castling for white and Queen side castling for black
4. **KQ** - Only King side and Queen side castling for white
5. **Kkq** - King side castling for white and King side and Queen side castling for black
6. **Kk** - Only King side castling for both white and black
7. **Kq** - King side castling for white and Queen side castling for black
8. **K** - Only King side castling for white
9. **Qkq** - Queen side castling for white and King side and Queen side castling for black
10. **Qk** - Queen side castling for white and King side castling for black
11. **Qq** - Only Queen side castling for both white and black
12. **Q** - Only Queen side castling for white
13. **kq** - Only King side and Queen side castling for black
14. **k** - Only King side castling for black
15. **q** - Only Queen side castling for black
16. **-** - No castling for both white and black



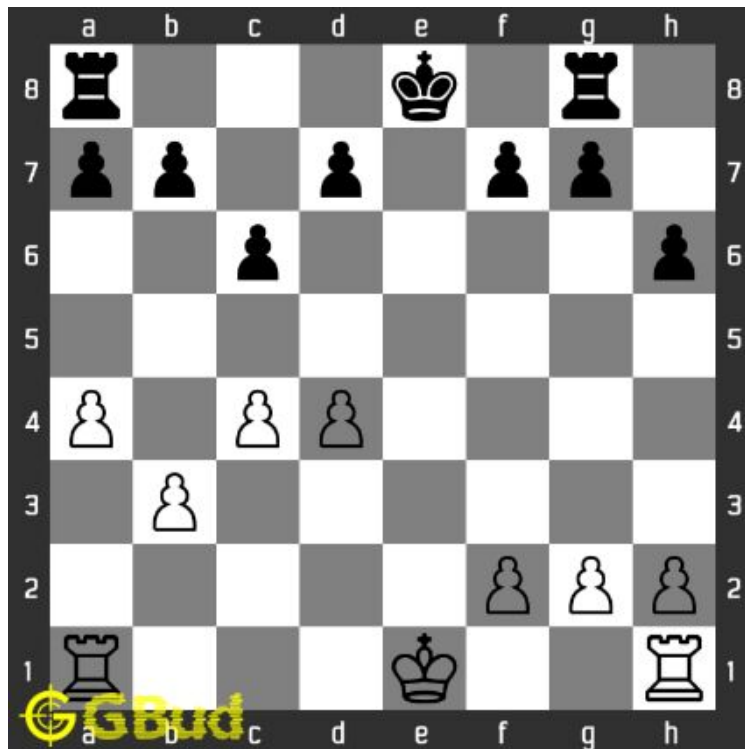


Figure 1.8: Chess fen castling availability KQq

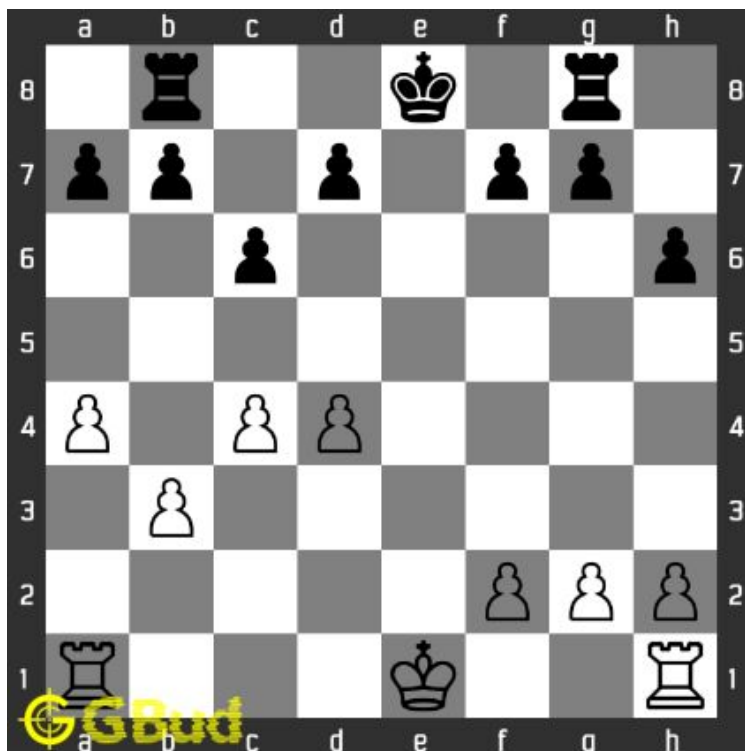


Figure 1.9: Chess fen castling availability KQ

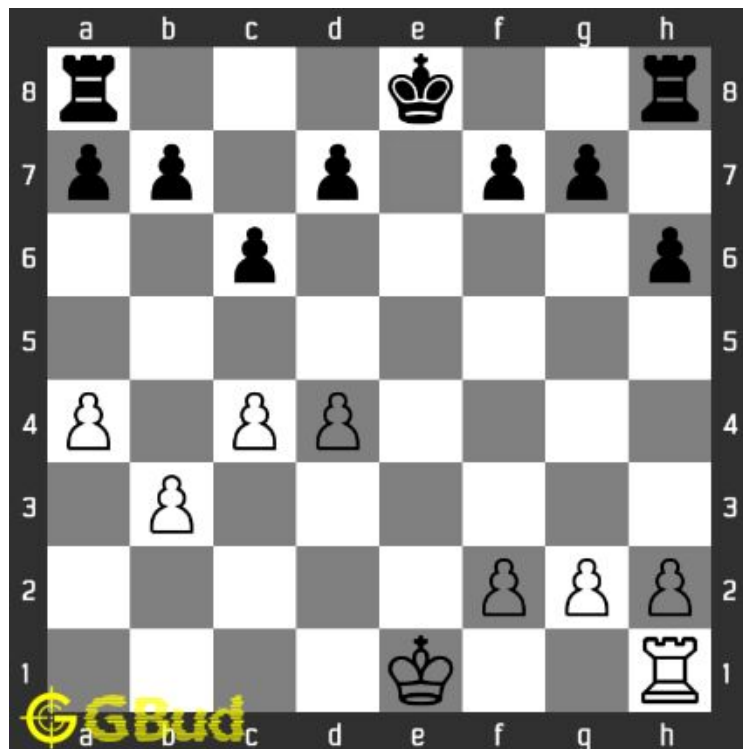


Figure 1.10: Chess fen castling availability Kkq

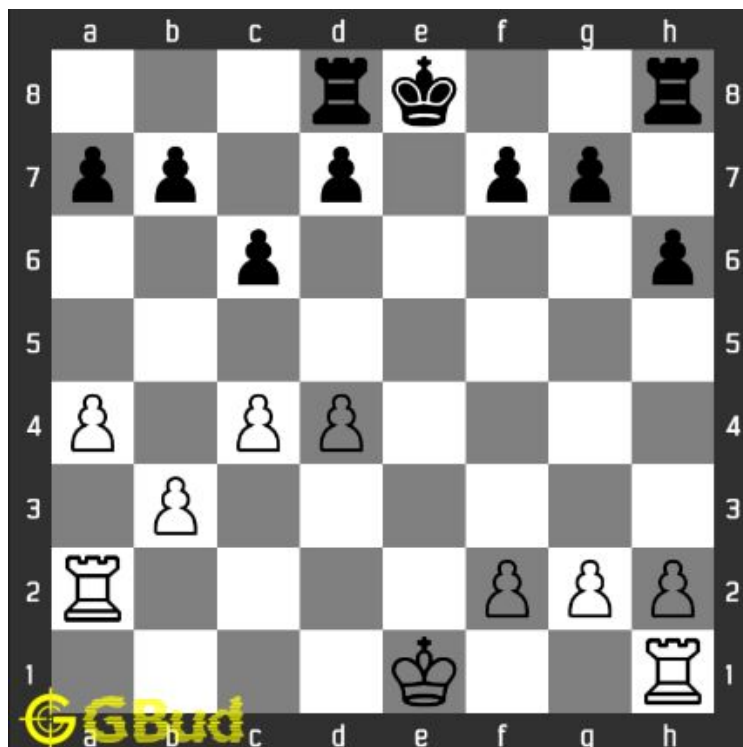


Figure 1.11: Chess fen castling availability Kk

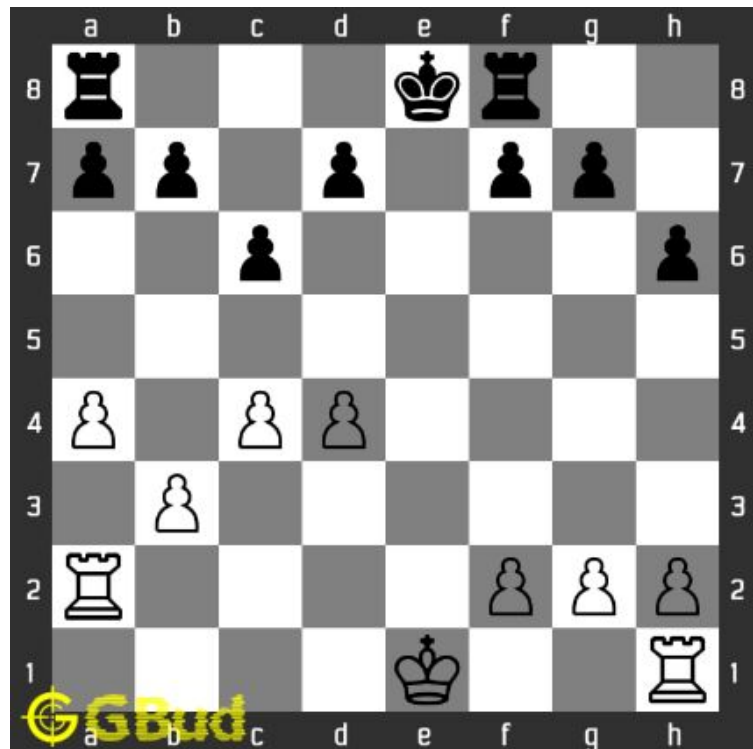


Figure 1.12: Chess fen castling availability Kq

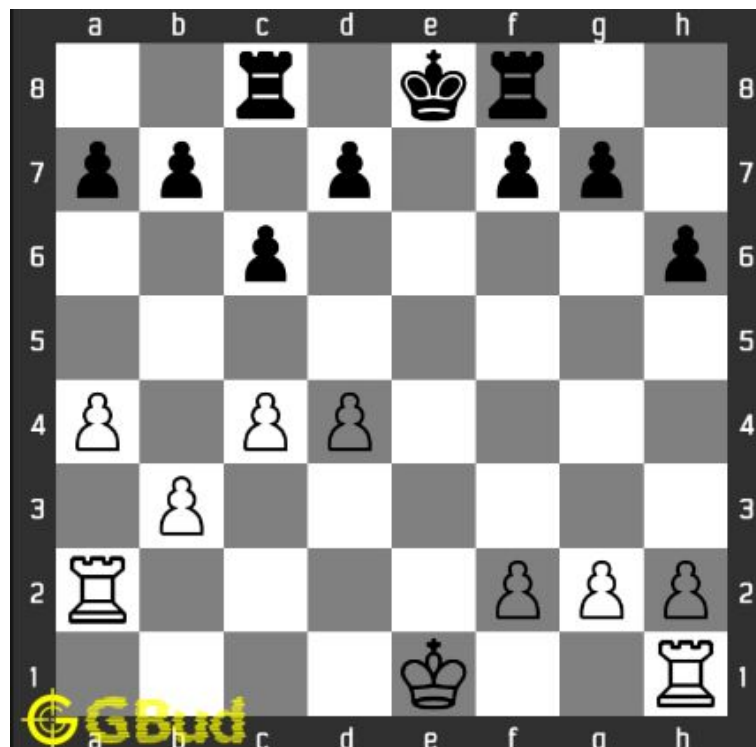


Figure 1.13: Chess fen castling availability K

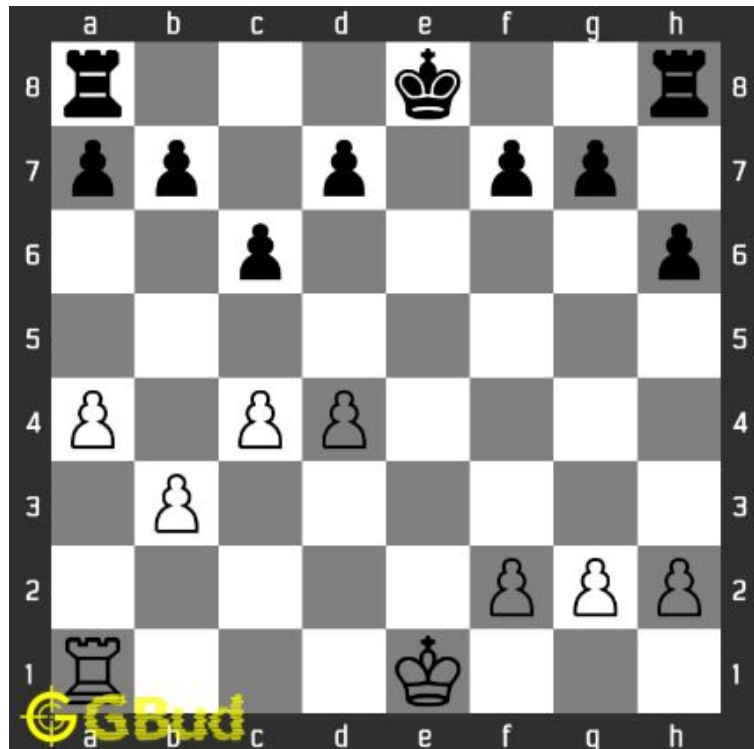


Figure 1.14: Chess fen castling availability Qkq

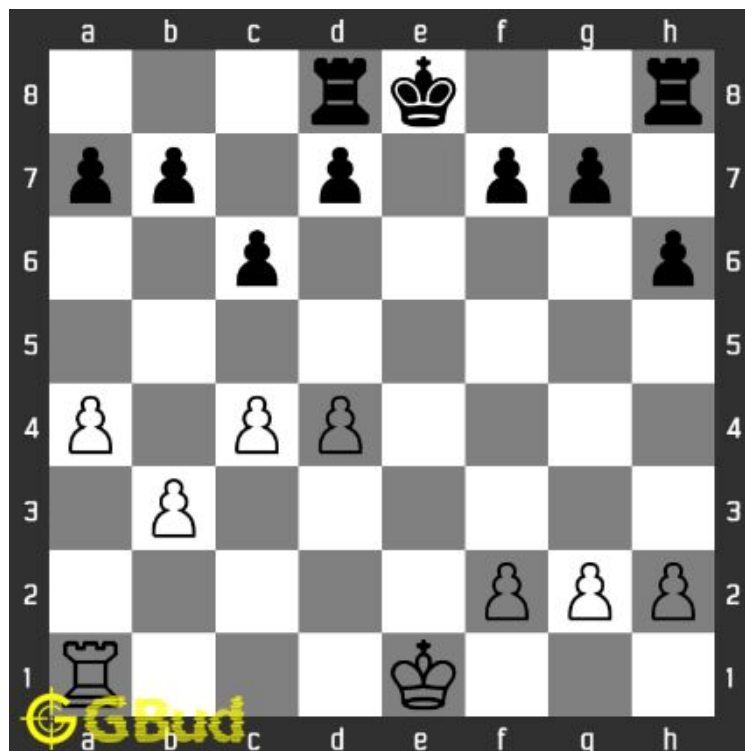


Figure 1.15: Chess fen castling availability Qk

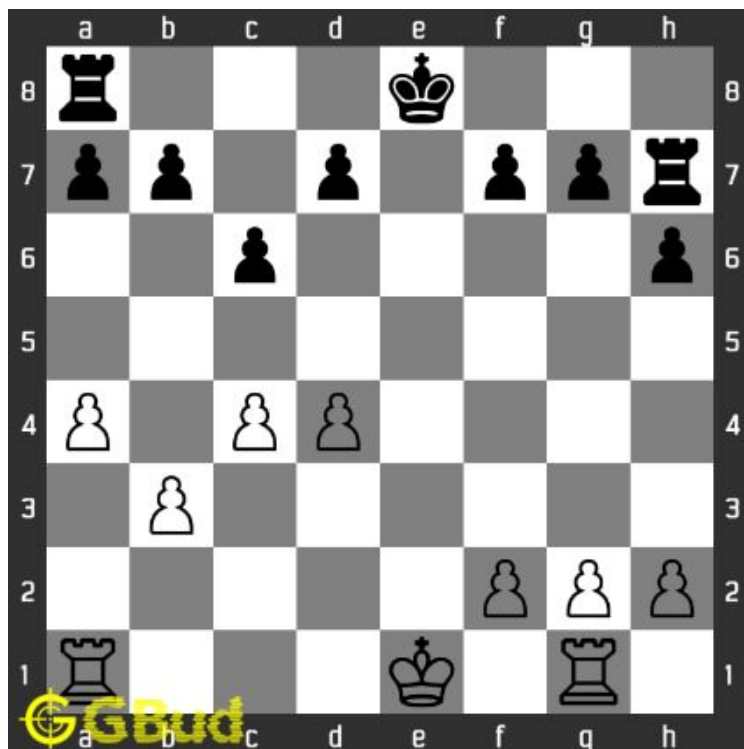


Figure 1.16: Chess fen castling availability Qq

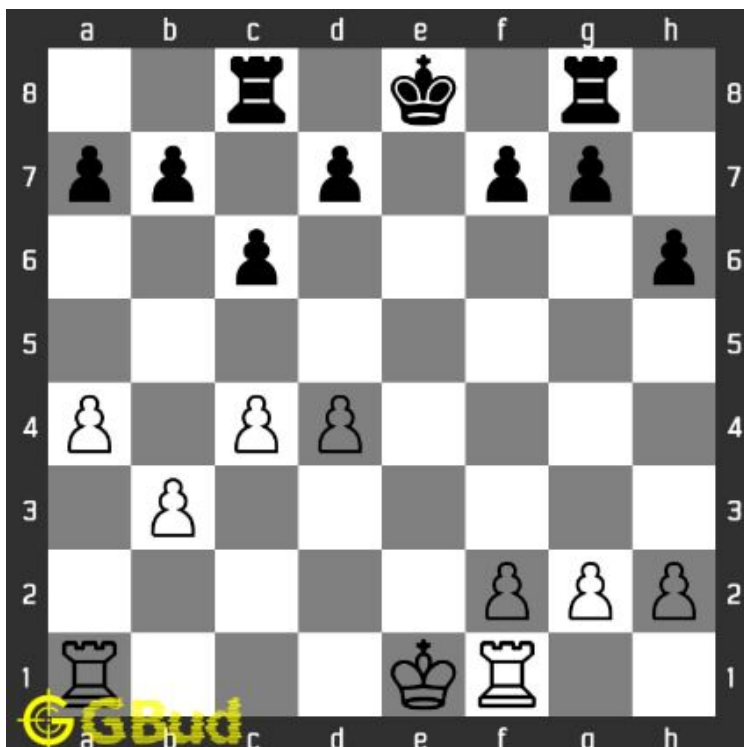


Figure 1.17: Chess fen castling availability Q

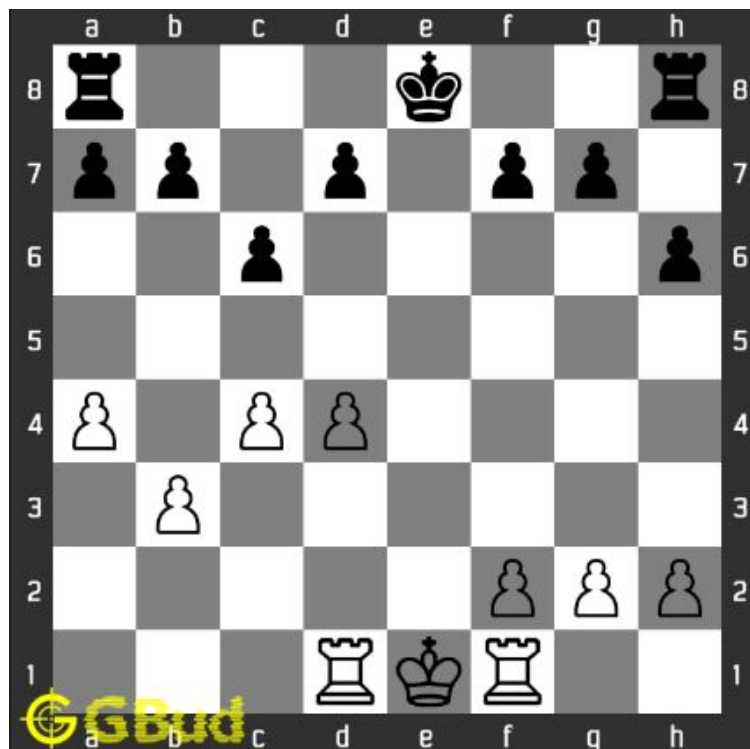


Figure 1.18: Chess fen castling availability kq

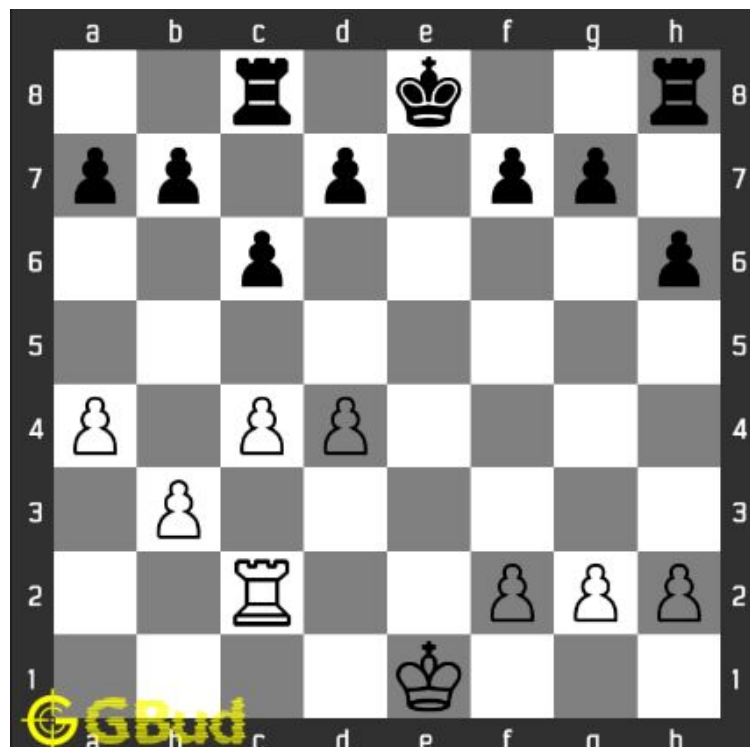


Figure 1.19: Chess fen castling availability k



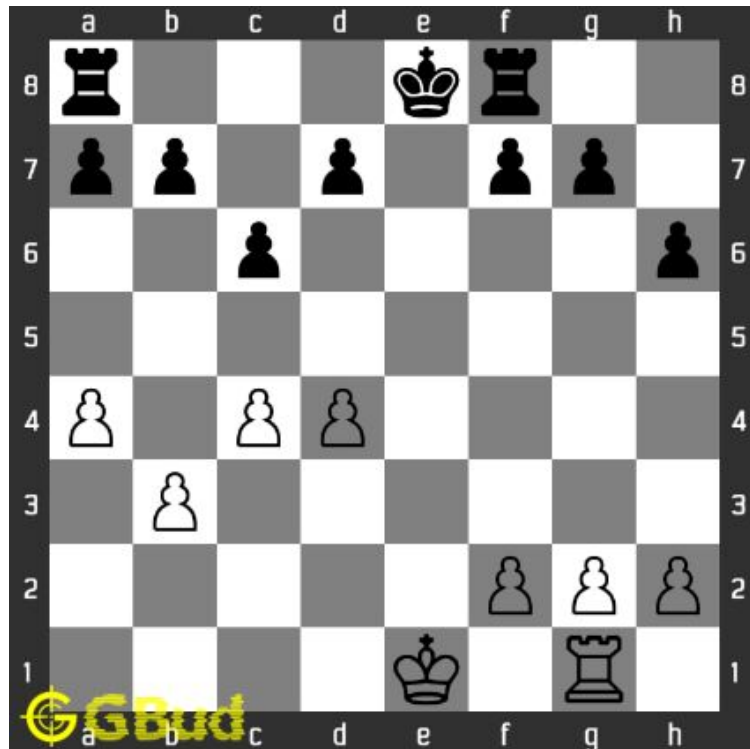


Figure 1.20: Chess fen castling availability q

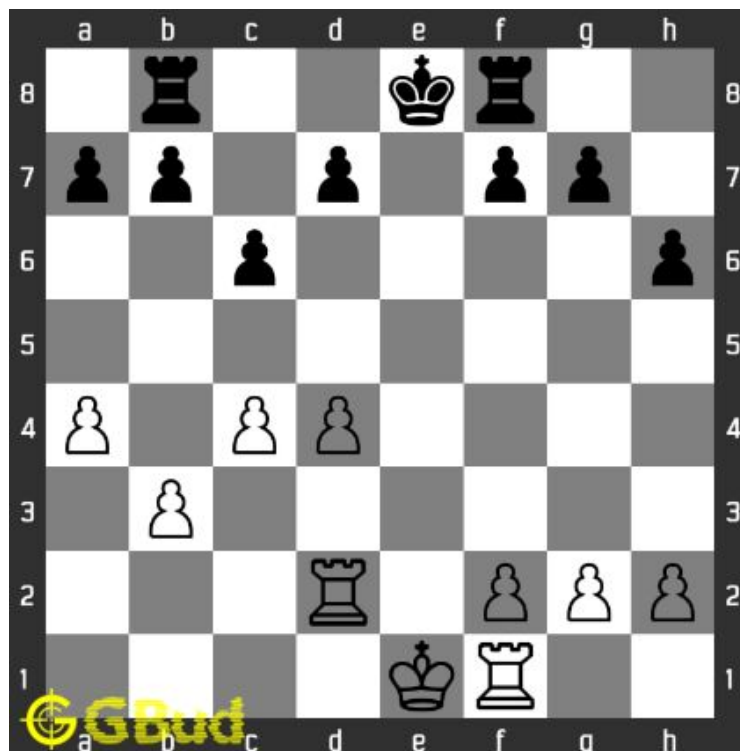


Figure 1.21: Chess fen castling availability -

## 1.2.6 En passant target square

Fourth field is En passant target square and this field represent the target square in case of a possibility of an [en passant capture](#) in the next move. The target [square](#) is specified irrespective of availability of opponent [piece](#) for the en passant capture to occur. The field is represented by a symbol - if no en passant capture target square is available. For example, for the fen [1r2kr2/pp1p1pp1/2p4p/7P/P1PP4/1P6/5PP1/R3K2R b KQ - 0 20](#), g6 is the [en passant target square](#) if the last move is the black pawn from g7 to g5. Latest fen is [1r2kr2/pp1p1p2/2p4p/6pP/P1PP4/1P6/5PP1/R3K2R w KQ g6 0 21](#) .

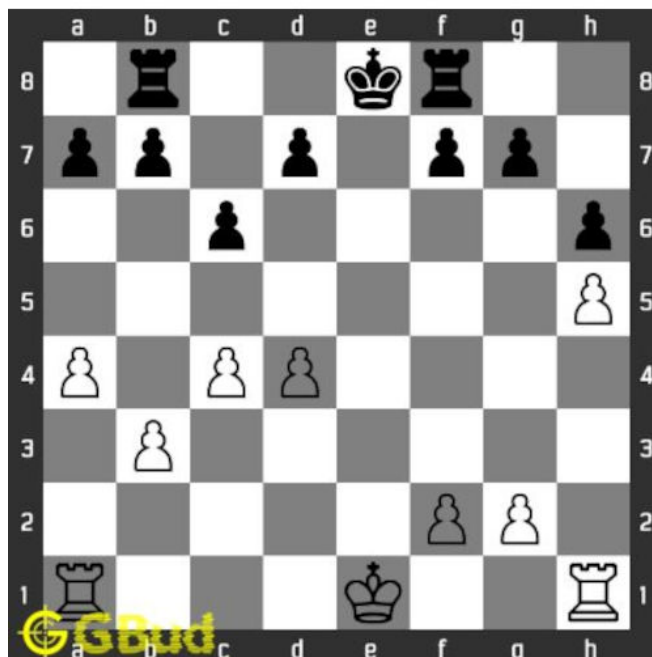


Figure 1.22: Board position before last position

## En passant target square

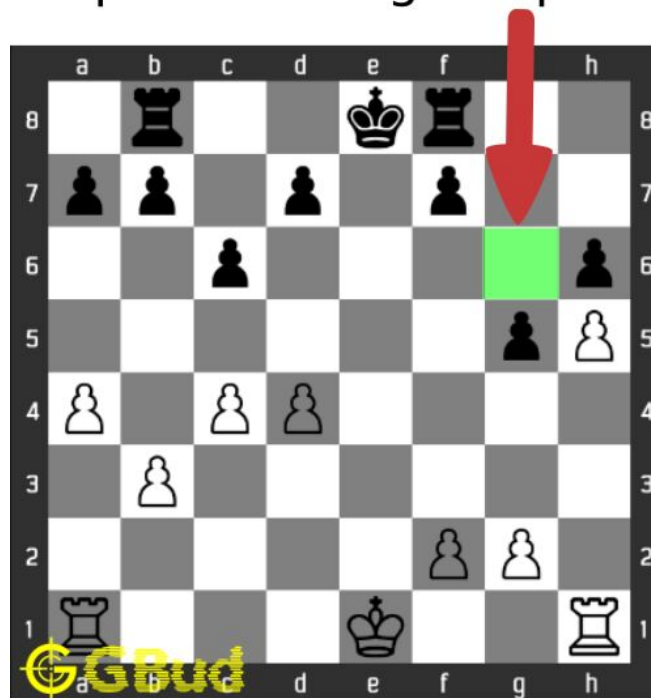


Figure 1.23: En passant target square

### 1.2.7 Halfmove clock

Fifth field represents the half move clock. The number of half moves since the last [capture](#) or [pawn advance](#) is notified in this field. When a capture occurs or a pawn advances, this field will be reset to zero. This number is also used in the [draw](#) of match based on [fifty move rule](#)

### 1.2.8 Fullmove number

Sixth field in fen is [full move](#) number. This number is incremented by 1 after every move by the black piece.

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