

# C++ Fundamentals – Regular Exam – 10 February 2024

Please submit your source code to all below-described problem in [Judge](#).

## 2. Chess

You will read and analyze a **chess board**.

### Input

The chess board is a **8 x 8 matrix of char**. Each character represents a type of figurine, as follows:

- Type of the figurine:
  - **K** for King
  - **Q** for Queen
  - **R** for Rook
  - **B** for Bishop
  - **N** for kNight
  - **P** for Pawn
  - **.** for empty space in the board
- Color of the figure:
  - if it's a **small letter**, it's Black
  - if it's a **capital letter**, it's White. In the description above the figurines are all white.
  - For example: an input row "**P . k . . K . p**" represents one row of the chessboard, with the following figurines:
    - on position 1 it has a **white pawn**;
    - then there's an **empty square**;
    - on position 3 there's the **black King**;
    - then there're two **empty squares**
    - then there's the **white King**
    - then there's an **empty square**
    - then there's a **black pawn**;

### Output

After you read the chessboard, analyze the data and print the following:

- A list of all while figures on the board. If there are no white figures, print "<no white figures>"
- A list of all black figures on the board. If there are no black figures, print "<no black figures>"
- **Note:** if you have more than one figure, it must appear in the list twice!

After you print these lists, change the color of all figurines to the other color (white to black and black to white), and print the chess board.

### Hints:

You do not need to check for the correctness of the board! It's perfectly OK to have two white kings or no black king, but three black queens instead.

## Example 1

Input	Output	Explanation
<pre>...b..PP .pp...N ....Q... ....K... ...R.... ..... ...r..k. B.....n</pre>	<pre>PPNQKRB bpprkn ...B..pp .PP...n ....q... ....k... ...r.... ..... ...R..K. b.....N</pre>	<p>The chess board rows:</p> <ol style="list-style-type: none"> <li>1. Three empty spaces, then a black bishop, then two empty spaces, then two white pawns</li> <li>2. One empty space, then two black pawns, then four empty spaces, then a white knight</li> <li>3. Four empty spaces, then a white queen, then three empty spaces</li> <li>4. Four empty spaces, then a white king, then three empty spaces</li> <li>5. Three empty spaces, then a white rock, then four empty spaces</li> <li>6. Eight empty spaces</li> <li>7. Three empty spaces, then black rock, then two empty spaces, then black king, then one empty space</li> <li>8. White bishop, then six empty spaces, then black knight.</li> </ol> <p>The analysis shows and prints:</p> <p>White figures: "PPNQKRB "</p> <p>Black figures: "bpprkn "</p> <p>The board after reversal.</p>

## Example 2

Input	Output
<pre>p..QQ..P ..KKK... ..... ..kkk... ..pp.... ..nnn... ..... p.....P</pre>	<pre>QQPKKKP pkkkppnnp P..qq..p ..kkk... ..... ..KKK... ..PP.... ..NNN... ..... P.....p</pre>

## Example 3

Input	Output
<pre>RNBQKBNR PPPPPPPP ..... ..... ..... ..... PPPPPPPP</pre>	<pre>RNBQKBNRPPPPPPPPPPPPPPPPPPRNBQKBNR &lt;no black figures&gt; rnbqkbnr pppppppp ..... ..... .....</pre>

RNBQKBNR	..... pppppppp rnbqkbnr
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