2056. Number of Valid Move Combinations On Chessboard

Description

There is an `8 x 8` chessboard containing `n` pieces (rooks, queens, or bishops). You are given a string array `pieces` of length `n`, where `pieces[i]` describes the type (rook, queen, or bishop) of the `i th` piece. In addition, you are given a 2D integer array `positions` also of length `n`, where `positions[i] = [r i , c i ]` indicates that the `i th` piece is currently at the **1-based** coordinate `(r i , c i )` on the chessboard.

When making a **move** for a piece, you choose a **destination** square that the piece will travel toward and stop on.

- A rook can only travel **horizontally or vertically** from `(r, c)` to the direction of `(r+1, c)`, `(r-1, c)`, `(r, c+1)`, or `(r, c-1)`.
- A queen can only travel **horizontally, vertically, or diagonally** from `(r, c)` to the direction of `(r+1, c)`, `(r-1, c)`, `(r, c+1)`, `(r, c-1)`, `(r+1, c+1)`, `(r+1, c-1)`, `(r-1, c+1)`, `(r-1, c-1)`.
- A bishop can only travel **diagonally** from `(r, c)` to the direction of `(r+1, c+1)`, `(r+1, c-1)`, `(r-1, c+1)`, `(r-1, c-1)`.

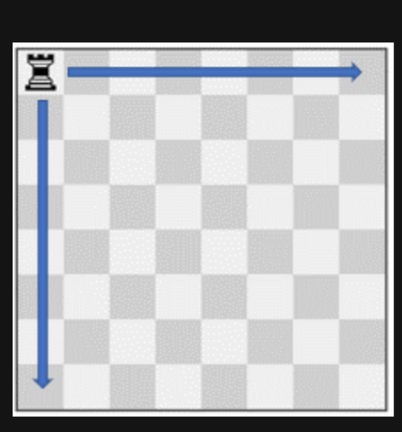
You must make a **move** for every piece on the board simultaneously. A **move combination** consists of all the **moves** performed on all the given pieces. Every second, each piece will instantaneously travel **one square** towards their destination if they are not already at it. All pieces start traveling at the `0 th` second. A move combination is **invalid** if, at a given time, **two or more** pieces occupy the same square.

Return *the number of **valid** move combinations*.

Notes:

- **No two pieces** will start in the **same** square.
- You may choose the square a piece is already on as its **destination**.
- If two pieces are **directly adjacent** to each other, it is valid for them to **move past each other** and swap positions in one second.

Example 1:



```
Input: pieces = ["rook"], positions = [[1,1]]
Output: 15
Explanation: The image above shows the possible squares the piece can move to.
```

Example 2:

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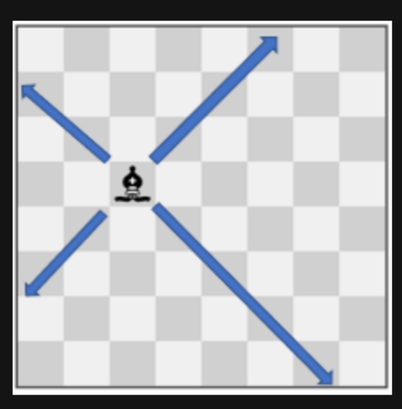
Input: pieces = ["queen"], positions = [[1,1]]
Output: 22
Explanation: The image above shows the possible squares the piece can move to.
```

Example 3:



```
Input: pieces = ["bishop"], positions = [[4,3]]
Output: 12
Explanation: The image above shows the possible squares the piece can move to.
```

Constraints:

- `n == pieces.length`
- `n == positions.length`
- `1 <= n <= 4`
- `pieces` only contains the strings `"rook"`, `"queen"`, and `"bishop"`.
- There will be at most one queen on the chessboard.
- `1 <= x i , y i <= 8`
- Each `positions[i]` is distinct.