Problem L: Looking for Waldo

You may know the game *Where is Waldo?*. In this game you need to find a person named Waldo in a crowd of people. This problem is kind of similar. You need to find an axis-aligned rectangle of minimal area which contains the letters `W`, `A`, `L`, `D` and `O` and those letters are hidden in a crowd of other letters.

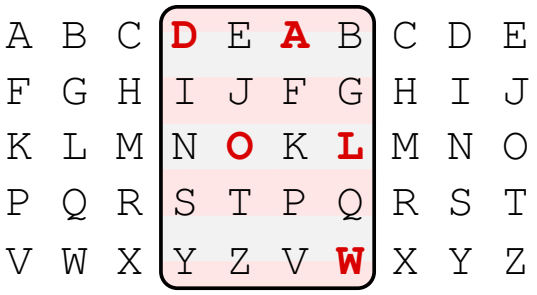


Figure L.1: Illustration of the second sample case.

Input

The input consists of:

- One line with two integers h and w ($1 \leq h, w \leq 10^5$, $h \cdot w \leq 10^5$), the height and width of the grid of letters.
- h lines, each with w upper case letters `A`-`Z`, the grid of letters.

Output

Output the area of the smallest axis-aligned rectangle which contains at least one of each of the letters `W`, `A`, `L`, `D` and `O`. If there is no rectangle containing those letters, output `impossible`.

Sample Input 1	Sample Output 1
5 5 ABCDE FGHIJ KLMNO PQRST VWXYZ	25

Sample Input 2	Sample Output 2
5 10 ABCDEABCDE FGHIJFGHIJ KLMNOKLMNO PQRSTPQRST VWXYZVWXYZ	20

Sample Input 3

```
5 10
WAALDLODOW
AWWLAOODOW
LOLADOWALO
ADALLLWWOL
WWOOAAAALO
```

Sample Output 3

```
5
```

Sample Input 4

```
2 3
WAL
TER
```

Sample Output 4

```
impossible
```