K   Looking for Waldo

Time limit: 1s

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.
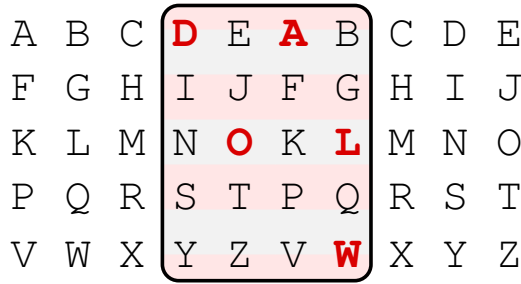

Figure K.1: Illustration of the second sample case.

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

```
5 10
ABCDEABCDE
FGHIJFGHIJ
KLMNOKLMNO
PQRSTPQRST
VWXYZVWXYZ
```

Sample Output 2

```
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
```