

# Problem G

## Palindromic Word Search

Time limit: 6 seconds

Given a rectangular grid of uppercase letters, find a rectangular region of the grid of maximum possible area such that there is a horizontal palindrome spanning some row of the rectangular region and a vertical palindrome spanning some column of the rectangular region. Recall a palindrome is a string that equals its own reversal.

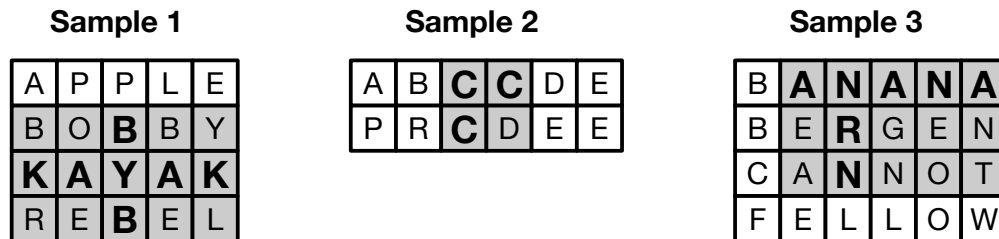


Figure G.1: Illustration of optimal solutions to the sample inputs. In the shaded subregions, a palindrome spanning an entire row of the region and a palindrome spanning an entire column of the region are highlighted.

### Input

The first line contains two integers  $R$  and  $C$  ( $1 \leq R, C \leq 500$ ). Then next  $R$  lines describe the grid, each containing exactly  $C$  uppercase letters.

### Output

Output a single integer  $A$  indicating the largest area of a rectangular region of the grid such that there is a horizontal palindrome spanning some row and a vertical palindrome spanning some column of the rectangular region.

Sample Input 1	Sample Output 1
<pre>4 5 APPLE BOBBY KAYAK REBEL</pre>	<pre>15</pre>

### Sample Input 2

```
2 6  
ABCCDE  
PRCDEE
```

### Sample Output 2

```
4
```

### Sample Input 3

```
4 6  
BANANA  
BERGEN  
CANNOT  
FELLOW
```

### Sample Output 3

```
15
```