

C. You Are Given a WASD-string...

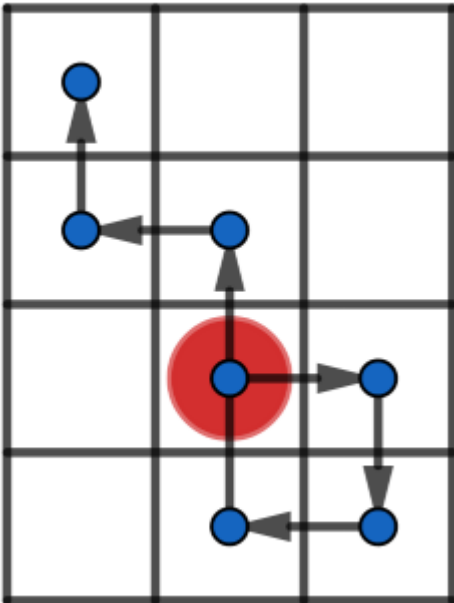
time limit per test: 2 seconds  
memory limit per test: 256 megabytes  
input: standard input  
output: standard output

You have a string  $s$  — a sequence of commands for your toy robot. The robot is placed in some cell of a **rectangular** grid. He can perform four commands:

- 'W' — move one cell up;
- 'S' — move one cell down;
- 'A' — move one cell left;
- 'D' — move one cell right.

Let  $Grid(s)$  be the grid of minimum possible area such that there is a position in the grid where you can place the robot in such a way that it will not fall from the grid while running the sequence of commands  $s$ . For example, if  $s = \text{DSAWWAW}$  then  $Grid(s)$  is the  $4 \times 3$  grid:

- you can place the robot in the cell  $(3, 2)$ ;
- the robot performs the command 'D' and moves to  $(3, 3)$ ;
- the robot performs the command 'S' and moves to  $(4, 3)$ ;
- the robot performs the command 'A' and moves to  $(4, 2)$ ;
- the robot performs the command 'W' and moves to  $(3, 2)$ ;
- the robot performs the command 'W' and moves to  $(2, 2)$ ;
- the robot performs the command 'A' and moves to  $(2, 1)$ ;
- the robot performs the command 'W' and moves to  $(1, 1)$ .



You have 4 extra letters: one 'W', one 'A', one 'S', one 'D'. You'd like to insert **at most one of these letters** in any position of sequence  $s$  to minimize the area of  $Grid(s)$ .

What is the minimum area of  $Grid(s)$  you can achieve?

Input

The first line contains one integer  $T$  ( $1 \leq T \leq 1000$ ) — the number of queries.

Next  $T$  lines contain queries: one per line. This line contains single string  $s$  ( $1 \leq |s| \leq 2 \cdot 10^5$ ,  $s_i \in \{\text{W, A, S, D}\}$ ) — the sequence of commands.

It's guaranteed that the total length of  $s$  over all queries doesn't exceed  $2 \cdot 10^5$ .

Output

Print  $T$  integers: one per query. For each query print the minimum area of  $Grid(s)$  you can achieve.

Example

input	Copy
3 DSAWWAW D WA	
output	Copy
8 2 4	

Note

In the first query you have to get string DSAWWDAW.

In second and third queries you can not decrease the area of  $Grid(s)$ .

Educational Codeforces Round 70  
(Rated for Div. 2)

Finished

Practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Practice

You are registered for practice. You can solve problems unofficially. Results can be found in the contest status and in the bottom of standings.

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++11 5.1.0

Choose file: 选择文件 未选择任何文件

Submit

→ Problem tags

brute force data structures dp greedy implementation math strings \*2100

No tag edit access

→ Contest materials

Announcement #1 (en)

Announcement #2 (ru)

Tutorial (en)