Name the Puppy

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	512 megabytes

Yuan bought a cute puppy for Chinese Valentine's Day. But before telling his lover, he needs to name the puppy.

Let $\overline{s}$ denote the reverse of string s. Given a string s of length n, we call s' of length $n'(n' < n)$ an **anti-border** of s if s' is a prefix of s and $\overline{s'}$ is also a suffix of s.

His lover loves **anti-border** so much that Yuan decides to choose a name which has the longest **anti-border** for the puppy. However, Yuan can only choose a name that he can spell.

Formally speaking, the set of words Yuan can spell is $\{s_1, s_2, s_3, \cdots, s_n\}$. The set of all possible names S is defined as follows:

- $s_i \in S (1 \le i \le n)$.
- If $x, y \in S$, then $x + y \in S$. The $+$ here means simple string concatenation.

Let $f(s)$ denote the length of the longest **anti-border** of s. Please help Yuan calculate $\max\limits_{x \in S}\{f(x)\}$ or tell him the result is infinity.

Input

The first line contains an integer n, denoting the number of strings.

The $(i+1)$-th line $(1 \le i \le n)$ contains a string s_i.

It is guaranteed that $1 \le n \le 5000, 1 \le \sum\limits_{i=1}^{n} |s_i| \le 5000$ and words only consist of lowercase letters.

Output

Output `INF` if the result is infinity, output an integer indicating the result otherwise.

Examples

standard input	standard output
4 ab cbba bccd eddc	6
3 abcdefg gfe dcba	INF

Note

In the first test case, $f(x) = 6$ when $x = s_1 + s_3 + s_4 + s_2$. It can be proved that there is no x such that $x \in S, f(x) > 6$. So the result is 6.