Area code (`prefix`)

Time limit:	1.0 seconds
Memory limit:	16 MiB

Donald Duck has n friends in the city of Duckburg. He has all their phone numbers, each represented as a string s_i, $i = 1 \ldots, n$. The phone numbers are all of the same length and contain digits from 0 to 9 only. Donald Duck wants to find out the phone prefix of the city.

Assuming that the city phone prefix is the longest common prefix of all the numbers of his friends, s_i $(1 \leq i \leq n)$. H help Donald Duck find the LENGTH of the prefix of Duckburg.

Scoring

Your program will be tested on several test cases, gathered in subtasks. To obtain the full score in a subtask, your program has to solve correctly all tests in that subtask.

- **Subtask 1** [**0 points**]: the example tests shown below.
- **Subtask 2** [**40 points**]: $n \leq 100$.
- **Subtask 3** [**30 points**]: $n \leq 30\,000$.
- **Subtask 4** [**30 points**]: no limits.

Input/output's Format

Your program will have to read the following data from standard console input:

- Row 1: contains the integer n, the number of friends of Donald Duck
- The next n rows contain the strings $s_1, s_2, \ldots, s_n$, the phone numbers of his friends.

Your program will have to print on the console the following:

- An integer: the length of the longest prefix in all n strings.

Constraints

- $2 \leq n \leq 300\,000$.
- All phone numbers are of the same length and include digits from 0 to 9 only.
- The length of the phone numbers is at most 20.
- All phone numbers are different from each other.

Examples

stdin	stdout
4 12345 12395 12349 12312	3
7 919239144321 919239143321 919239124891 919239144311 919239144621 919239142027 919239146352	7

Explanation

- In **the first example test case** the prefix is `123`, of length 3.
- In **the second example test case** the prefix is `9192391`, of length 7.