Problem C. Ambar and Strings

Input file:	`standard input`
Output file:	`standard output`
Time limit:	4 seconds
Memory limit:	256 megabytes

Ambar has been gifted N strings $S_1, S_2, \ldots S_N$ by Billu, so he is quite happy. In a cruel twist, Billu asks him to find the number of unordered pairs i, j such that $\texttt{LCP}(S_i, S_j) = k$, where `LCP` of two strings is the length of longest common prefix. Billu wants to know this number for all k from 0 to L, where L is the length of longest string among $S_1, \ldots S_N$.

Ambar is completely distraught and algorithmically disabled, so you must help.

Input

First line contains the integer N ($1 \leq N \leq 10^5$). Each of the next N lines contain a string, the $i - \texttt{th}$ is S_i ($N \leq \sum_{i=1}^{N} \mid S_i \mid \leq 10^6$). Each string is from alphabet $\texttt{a}, \texttt{b}, \ldots \texttt{z}$.

Output

Print $L + 1$ integers, the $k - \texttt{th}$ is the number of unordered pairs i, j such that $\texttt{LCP}(S_i, S_j) = k$ (where $k = 0 \ldots L$)

Example

standard input	standard output
3 abc acb abcd	0 2 0 1 0