A. Suffix Array - 1

time limit per test: 2 seconds
memory limit per test: 512 megabytes

Now try to implement the algorithm that was discussed in the lecture.

Write a program that reads the string s and prints the suffix array p for it.

Input
Input contains a single string s of length n ($1 \le n \le 100\,000$). String consists of small english letters.

Output
Print $n + 1$ distinct integers, indices of first characters of suffixes of s, ordered in lexicographical order.

Examples

input	Copy
ababba	
output	**Copy**
6 5 0 2 4 1 3	

input	Copy
aaaa	
output	**Copy**
4 3 2 1 0	

input	Copy
ppppplppp	
output	**Copy**
9 5 8 4 7 3 6 2 1 0	

input	Copy
nn	
output	**Copy**
2 1 0	