

SARRAY - Suffix Array

Given a string of length at most 100,000 consist of alphabets and numbers. Output the suffix array of the string.

A suffix array (http://en.wikipedia.org/wiki/Suffix_array) is an array of integers giving the starting positions (0-based) of suffixes of a string in lexicographical order. Consider a string "abracadabra0AbRa4Cad14abra". The size of the suffix array is equal to the length of the string. Below is the list of 26 suffixes of the string along with its starting position sorted in lexicographical order:

POS	SUFFIX
11	0AbRa4Cad14abra
20	14abra
16	4Cad14abra
21	4abra
12	AbRa4Cad14abra
17	Cad14abra
14	Ra4Cad14abra
25	a
10	a0AbRa4Cad14abra
15	a4Cad14abra
22	abra
7	abra0AbRa4Cad14abra
0	abracadabra0AbRa4Cad14abra
3	acadabra0AbRa4Cad14abra
18	ad14abra
5	adabra0AbRa4Cad14abra
13	bRa4Cad14abra
23	bra
8	bra0AbRa4Cad14abra
1	bracadabra0AbRa4Cad14abra
4	cadabra0AbRa4Cad14abra
19	d14abra
6	dabra0AbRa4Cad14abra
24	ra
9	ra0AbRa4Cad14abra
2	racadabra0AbRa4Cad14abra

Note: this is a partial score problem.

$O(n^2 \log(n))$ is expected to score about 20-30. (Naive sorting all suffixes)

$O(n \log^2(n))$ is expected to score about 40. (OK for most programming contest problems)

$O(n \log n)$ is expected to score about 60-70. (Use counting sort for small alphabet size)

$O(n)$ without tweaks is expected to score about 80-90.

$O(n)$ with tweaks is expected to score 100. (This is meant for fun only :)

Input

A single line containing the string.

Output

The suffix array of the string.

Example

Input:

abracadabra0AbRa4Cad14abra

Output:

11
20
16
21
12
17
14
25
10
15
22
7
0
3
18
5
13
23
8
1
4
19
6
24
9
2