

C2. Message Transmission Error (hard version)

time limit per test: 2 seconds

memory limit per test: 256 megabytes

This is a more difficult version of the problem. It differs from the easy one only by the constraints.

At the Berland State University, the local network between servers does not always operate without errors. When transmitting two **identical** messages consecutively, an error may occur, resulting in the two messages merging into one. In this merging, the end of the first message coincides with the beginning of the second. Of course, the merging can only occur at identical characters. The length of the merging must be a positive number less than the length of the message text.

For example, when transmitting two messages "abrakadabra" consecutively, it is possible that it will be transmitted with the described type of error, resulting in a message like "abrakadabrabrakadabra" or "abrakadabrakadabra" (in the first case, the merging occurred at one character, and in the second case, at four).

Given the received message t , determine if it is possible that this is the result of an error of the described type in the operation of the local network, and if so, determine a possible value of s .

A situation where two messages completely overlap each other should not be considered an error. For example, if the received message is "abcd", it should be considered that there is no error in it. Similarly, simply appending one message after another is not a sign of an error. For instance, if the received message is "abcabc", it should also be considered that there is no error in it.

Input

The input consists of a single non-empty string t , consisting of lowercase letters of the Latin alphabet. The length of the string t does not exceed $4\cdot 10^5$ characters.

Output

If the message t cannot contain an error, output "NO" (without quotes) in a single line of output.

Otherwise, in the first line, output "YES" (without quotes), and in the next line, output the string s — a possible message that could have led to the error. If there are multiple possible answers, any of them is acceptable.

Examples

input	Copy
abrakadabrabrakadabra	
output	Copy
YES abrakadabra	

input	Copy
acacacaca	
output	Copy
YES acacaca	

input	Copy
abcabc	
output	Copy
NO	

input	Copy
abababab	
output	Copy
YES ababab	

input	Copy
tatbt	
output	Copy
NO	

Note

In the second example, a suitable answer could also be the string "acacaca".

Testing Round 19 (Div. 3)

Finished

Practice



→ Virtual participation

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Start virtual contest

→ Clone Contest to Mashup

You can clone this contest to a mashup.

Clone Contest

→ Submit?

Language: GNU G++20 13.2 (64 bit, win

Choose file: Choose File No file chosen

Submit

→ Last submissions

Submission	Time	Verdict
280115421	Sep/06/2024 22:15	Accepted
280105941	Sep/06/2024 20:41	Accepted
280105785	Sep/06/2024 20:40	Accepted
278698148	Aug/30/2024 00:56	Accepted
278698108	Aug/30/2024 00:55	Runtime error on test 127

→ Problem tags

hashing string suffix structures strings

two pointers *1700

No tag edit access