

Alliance's Signal

Time Limit: 1 Second
Memory Limit: 2048 MB

In wartime, a critical signal is passed repeatedly from our allies. However, the signal observed is created by repeating an unknown minimum substring at least twice.

Assuming that you captured a recorded a segment of signal from your allies and it should be a substring of some repeated critical signal. Your mission is to decode the shortest possible critical signal string s_2 such that the observed sequence s_1 should be a segment of repetition of the critical signal. **And it is guaranteed that s_2 is repeated at least twice in the segment you captured.**

Given a captured string s_1 consisting of lowercase English letters, determine the one of the shortest possible length of the repeated critical signal s_2 .

Input

The input consists of:

- The captured string s_1 .

The length of the captured string is smaller than or equal to 10^6

Output

Output one of the shortest signal string

Sample Inputs

caacaaca

Sample Outputs

caa

The length of the shortest string is 3.