

Problem D

Substring Permutation

Given two strings S and P , there are several ways to find whether P appears as a substring of S . The simplest one would be directly checking whether P is equal to any substring of S . As there can be $O(|S|)$ substring of S of length $|P|$, this approach has $O(|S| \times |P|)$ time complexity. There is also a more sophisticated way by using *knuth-morris-pratt* (KMP) algorithm to solve this problem in $O(|S| + |P|)$.

In this problem, you are challenged to a similar problem.

Given two strings S and P . Let $\Pi(S)$ be the set containing all strings which are permutations of S , and $\Pi(P)$ be the set containing all strings which are permutations of P . Determine whether there exists a string $p \in \Pi(P)$ and a string $s \in \Pi(S)$, such that p appears as a substring of s .

For example, let $S = \text{guru}$ and $P = \text{rug}$. Then, $\Pi(S) = \{\text{gruu}, \text{guru}, \text{guur}, \text{rguu}, \text{rugu}, \text{ruug}, \text{ugru}, \text{ugur}, \text{urgu}, \text{urug}, \text{uugr}, \text{uurg}\}$, and $\Pi(P) = \{\text{gru}, \text{gur}, \text{rgu}, \text{rug}, \text{ugr}, \text{urg}\}$. Observe that the string rug in $\Pi(P)$ appears as a substring of the string rugu in $\Pi(S)$, i.e. $[\text{rug}]u$. In this example, you can also find another $\langle p, s \rangle$ which satisfies the requirement, e.g., $\langle \text{gru}, \text{gruu} \rangle$, $\langle \text{gru}, \text{ugru} \rangle$, $\langle \text{urg}, \text{uurg} \rangle$, $\langle \text{gur}, \text{guru} \rangle$, etc.

Input

Input contains two lines. The first line contains a string S ($1 \leq |S| \leq 100000$). The second line contains a string P ($1 \leq |P| \leq |S| \leq 100000$). Both S and P contains only lowercase alphabetical character (a-z).

Output

Output in a line "YES" (without quotes) if there exists a string $p \in \Pi(P)$ and a string $s \in \Pi(S)$, such that p appears as a substring of s ; otherwise, output "NO" (without quotes).

Sample Input #1

```
guru
rug
```

Sample Output #1

```
YES
```

Sample Input #2

```
icpc
inc
```

Sample Output #2

```
NO
```



Sample Input #3

```
yesorno  
sore
```

Sample Output #3

```
YES
```

Sample Input #4

```
indonesia  
icpcasia
```

Sample Output #4

```
NO
```