Assignment 1

APRG TAs

January 2023

§1 Problem 1

You are given an an array $\mathbf{A}$ and a number $\mathbf{N}$, determine if there exist indices $\mathbf{i} \neq \mathbf{j}$ such that $\mathbf{A[i]} \times \mathbf{A[j]} = \mathbf{N}$

Input:
The first line contains an array $\mathbf{A}$ in the form of space separated integers.
The second line contains a number $\mathbf{N}$.

Output:
Print **"YES"** if such indices as mentioned above exist, otherwise print **"NO"**.

Examples:

Input:
9 8 2 4 2 1 7 3
32

Output:
YES

Input:
9 18 2 5 2 1 37 3
31

Output:
NO

§2 Problem 2

Given 2 strings $\mathbf{A}$ and $\mathbf{B}$, determine whether $\mathbf{B}$ is a substring of $\mathbf{A}$.

Input:
The first line contains a string $\mathbf{A}$.
The second line contains a string $\mathbf{B}$.

Output:
If $\mathbf{B}$ is a substring of $\mathbf{A}$, print the indices i, j separated by a space such that $\mathbf{A[i:j]} = \mathbf{B}$, otherwise print -1.

Examples:

Input:
MathEmatiCAl
emAt

Output:
4 8

Input:
OxIdeCopPer
OprE

Output:
-1

§3 Problem 3

Given 2 arrays **A** and **B** of decimal numbers, both of same length n, print an array **C** with $C[i] = A[i] \times B[i]$ in binary.

Input:
The first line contains an array **A** in the form of space separated integers.
The second line contains an array **B** in the form of space separated integers.

Output:
Print the array **C** in the form of space separated binary numbers.

Examples:

Input:
2 4 2 1 5 3 2 9
7 6 4 0 8 1 8 3

Output:
1110 11000 1000 0 101000 11 10000 11011

§4 Problem 4

Given a number **N**, print its prime factors without multiplicity in decreasing order.

Input:
The first line contains **N**.

Output:
Print its prime factors separated by space in decreasing order.

Examples:

Input:
180

Output:
5 3 2

Input:
29

Output:
29