

Lab 4 B

Problem 1: Rearranging Student Marks

Imagine you are helping a teacher organize the marks of students in different subjects. The marks are stored in a table where each row represents a student and each column represents a subject. Now, the teacher asks you to rearrange the table so that each row shows marks of one subject across all students. Your task is to write a C program that takes this table as input and prints its transpose, where the rows become columns and the columns become rows.

Input Format:

- The first line contains two integers n and m — the number of students and the number of subjects respectively.
- The next n lines contain m integers each, representing the marks of a student in each subject.

Constraints:

- $1 \leq n, m \leq 10^3$
- Marks are non-negative integers.

Output Format:

- Print the transposed matrix, with each row showing the marks of one subject for all students.

Example:

[Copy](#)**Input:**

```
3 2
1 2
3 4
5 6
```

Output:

```
1 3 5
2 4 6
```

Input:

```
3 3
91 93 95
82 84 86
73 75 77
```

Output:

```
91 82 73
93 84 75
95 86 77
```

Problem 2: The Treasure Hunter's XOR Challenge

Imagine you're a treasure hunter exploring an ancient pyramid. Inside, you find a row of mysterious stones, each with a hidden number. These numbers represent an ancient code that must be deciphered to unlock the next chamber. Each stone has a unique number, and the key to cracking the code is to "transform" each number.

The transformation involves finding the next number that is a power of 2, greater than or equal to the number on the stone. You must then perform a special operation — XOR — between the number on the stone and this power of 2.

Your task is to decipher the code by applying this transformation to each stone and outputting the new numbers in order. The new numbers will reveal the final path to the treasure.

Input:

- The first line contains an integer N representing the number of stones.
- The second line contains N space-separated integers representing the values on the stones.

Output:

- Print the transformed array where each element is the result of XORing the stone's value with the next greater or equal power of 2.

Constraints:

- $1 \leq N \leq 3000000$
- $1 \leq \text{value of stone} \leq 10^6$

Example:

```
3
3 5 7
```

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Output:

```
7 13 15
```

Explanation:

For the input values [3, 5, 7], the next greater or equal powers of 2 are [4, 8, 8]. The XOR results are:

- $3 \text{ XOR } 4 = 7$
- $5 \text{ XOR } 8 = 13$
- $7 \text{ XOR } 8 = 15$

Therefore, the output is [7, 13, 15].

Problem 3: Hidden Word

Yash and his friend are communicating via a secret code. His friend sends him a true string and a hidden string. The true string is a subsequence of the hidden string. Yash needs to find if the true string is in the hidden string. Yash needs your help for it. Output "YES" if the true string is in the hidden string, otherwise output "NO".

Formally, given two strings `hidden` and `true`, determine if `true` is a subsequence of `hidden`. A subsequence of a string is a new string that is formed from the original string by deleting some (can be none) of the characters without disturbing the relative positions of the remaining characters.

Input:

- First line containing two space separated integers n m , size of the true string and the size of the hidden string

- Second line contains the `true` string
- Third line contains the `hidden` string

Output:

- YES or NO if the true string is present or is not present in the hidden string respectively

Constraints:

- $1 \leq n \leq 1e5$
- $1 \leq m \leq 1e5$

Input:

3 6

acf
abcdef

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Output:

YES

Input:

2 2

ab
cd

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Output:

NO

Submission Guidelines

- Do not rename any files given in the handout. Only write the code in the specified C files in the respective directories.