UNITED INTERNATIONAL UNIVERSITY
Department of Computer Science and Engineering (CSE)

Course Title: Data Structure & Algorithm Lab II **Course Code: CSE2218**

Trimester & Year: Fall 2021 **Section: D** **Credit Hours: 1.0** **AZ**

FINAL EVALUATION

Total Time: 90 minutes **Total Marks: 30**

You can use any materials available in the internet, class lecture or books. Viva will be conducted on your written codes and logics. Thus, be Self-Sufficient!!

Q1: The Perfectionist

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Alif is a perfectionist about numbers. He loves to arrange things in order and sticks to his "Golden rule" that every set of numbers must be in ascending order. Unfortunately, that is not always the case. Alif defines that when a smaller number comes after a larger number in the set then number of violations are required to fix the order.

Given a set of integers, Alif needs to find out the total number of such violations.

Input:

- The first line contains **n**, the number of integers.
- The second line contains n space separated integers $\mathbf{a_0 \ldots a_{n-1}}$

Output:

The output is an integer indicating the total number of violations.

Example:

Sample Input	Sample Output	Explanation
5 4 5 6 7 1	4	1 violates which requires 4 violation to be fixed as 1 4 5 6 7.
5 5 4 3 2 1	10	4 violates which requires 1 violation to be fixed as 4 5 3 2 1. Then again 3 violates which requires 2 violation to be fixed as 3 4 5 2 1. Then again 2 violates which requires 3 violation to be fixed as 2 3 4 5 1. Then again 1 violates which requires 4 violation to be fixed as 1 2 3 4 5. Total violations required = 1+2+3+4 =10

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Q2: Taking Class Lecture!! **20**

You have a new instructor of DS and Algo Laboratory II named Mr. Akib Zaman. He speaks very quickly and keeps on moving faster with lots of lectures. It is very important to take class lectures for keeping up with him. Thus, you come up an innovative idea to keep up with his lecture and make notes.

You know two languages, Mr. Akib is giving the lecture in the first one. The words in both languages consist of lowercase English characters; each language consists of several words. For each language, all words are distinct, i.e. they are spelled differently. Moreover, the words of these languages have a one-to-one correspondence, that is, for each word in each language, there exists exactly one word in the other language having has the same meaning.

You can write down every word the instructor says in either the first language or the second language. **Of course, during the lecture you write down each word in the language in which the word is shorter. In case of equal lengths of the corresponding words you prefer the word of the first language.**

You are given the text of the exact lecture of Mr. Akib. Find out how the lecture will be recorded in your notes according to your innovative idea.

Input

- The first line contains two integers, **n** : the number of words in the instructor's lecture and **m** : the number of words in each of these languages where $1 \le n \le 3000$, $1 \le m \le 3000$ $1 \le n \le 3000$ and $1 \le m \le 3000$
- The following **m** lines contain the words. The $i-th$ line contains two strings a_i and b_i where the word a_i belongs to the first language, the word b_i belongs to the second language, and these two words have the same meaning. It is guaranteed that no word occurs in both languages, and each word occurs in its language exactly once.
- The next line contains **n** space-separated strings $c_1, c_2, \ldots, c_n$ which are the text of the lecture. It is guaranteed that each of the strings c_i belongs to the set of strings $a_1, a_2, \ldots, a_m$ i.e. belongs to the first language.
- All the strings in the input are non-empty, each consisting of no more than 10 lowercase English letters.

Output

Output exactly **n** words: how you will record the lecture in your notebook. Output the words of the lecture in the same order as in the input.

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Sample Examples:

Sample Input	Sample Output	Explanation
5 4 hello hi student class happy round visiting meeting hello student happy visiting student	hi class happy meeting class	➢ hello and hi → hi smaller ➢ student and class → class smaller ➢ happy and round same length → 1st language priority thus happy ➢ visiting and meeting → meeting smaller ➢ student and class → class smaller
5 3 joll wuqrd euzf un hbnyiyc rsoqqveh hbnyiyc joll joll euzf joll	hbnyiyc joll joll un joll	