WYSD Inter Polytechnic Programming Contest 2021

Schedule

The contest will run for **3h0m0s**.

Rules

This contest is formatted as per the official rules of ICPC Regional Programming Contests.

You can use Bash 5.0, Brainf*ck, C# Mono 6.0, C++11 GCC 7.4, C++14 GCC 8.3, C++17 GCC 9.2, C11 GCC 9.2, Common Lisp SBCL 2.0, Erlang 22.3, Free Pascal 3.0, Go 1.13, Haskell 8.6, Java 1.8, Kotlin 1.1, Lua 5.4, Node.js 10.16, Perl 5.30, PHP 7.2, PyPy 7.1 (2.7), PyPy 7.1 (3.6), Python 2.7, Python 3.7, Python 3.8, Ruby 2.6, Swift 5.3, and Whitespace in this contest.

Be fair, be honest. Plagiarism will result in disqualification. Judges' decisions will be final.

Notes

There are 6 challenges in this contest.

Please make sure this booklet contains all of the pages.

If you find any discrepencies between the printed copy and the problem statements in Toph Arena, please rely on the later.

Disclaimer

The contents of this contest, as prepared by its organizer, may not have been reviewed by Toph and does not necessarily represent Toph's views.

A. KickShot Game

Limits 1s, 512 MB

Adnan invented a new game named KickShot. He is training N groups of player. Each group consists M players. After training each payer gained some points. The player of ith $(1 \le i \le M)$ position of the jth $(1 \le j \le N)$ group gained $R_{j,i}$ points. Now Adnan wants to choose some players from the groups such that:

1. he cannot choose two adjacent player of the same group *i.e.* if he choose i^{th} $(1 \le i < M)$ player of the jth group, he cannot choose $(i+1)^{th}$ player of the jth group.

2. he cannot choose player of the same position from different groups *i.e.* if he choose i^{th} $(1 \le i < M)$ player of the jth $(1 \le j \le N)$ group, he cannot choose a player of ith position from any other group.

3. Total points of the selected player is maximum possible.

Calculate the maximum possible total points.

Input

First line of the input contains two space separated integers N $(1 \le N \le 2000)$ and M $(1 \le M \le 500)$—the number of groups and the number of players in each group.

Each of next N lines contains M space separated integers $R_{j,1}, R_{j,2}, \ldots\ldots\ldots\ldots\ldots, R_{j,M} (1 \le R_{j,i} \le 10^9)$— the points gained by the ith $(1 \le i < M)$ player of the jth $(1 \le j \le N)$ group.

Output

Print the maximum total points in a single line.

Samples

Input	Output
2 5 2 5 7 9 10 9 1 5 4 12	40

| Input	Output
2 5 2 3 40 5 10 20 9 7 20 42	102

B. Mahir's Wedding Gift

Limits 1s, 512 MB

Today is Mahir's wedding ceremony. He arranges some big boxes. Every big box contains some small boxes inside of it. He will give his bride a jar with many tickets. Every ticket has written a number on it. She will blindly choose two tickets from the jar. Let's call the number from these two tickets X and Y. Mahir can get small boxes from bigger boxes whose values are greater than X also smaller boxes whose values are greater than Y inside of selected bigger boxes. How many smaller boxes can he have? You have to answer Q queries.

Let's consider this example:
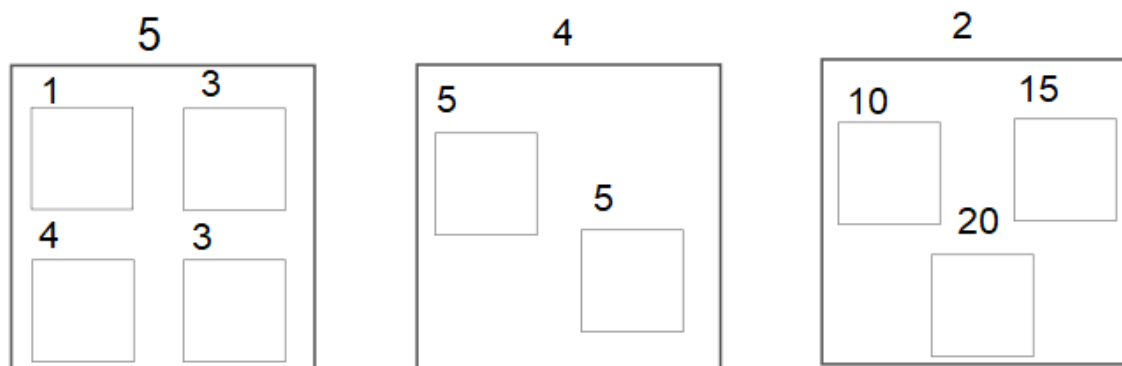
Here are 3 big boxes and 9 small boxes. And all boxes are numbered.

If Mahir's chosen values are $X = 2$ and $Y = 3$ then he can get 1 small box (numbered $4 > Y$) from the first big box (numbered $5 > X$) and 2 small boxes (numbered $5 > Y$ and $5 > Y$) from the second big box (numbered $4 > X$). So, Drogo can get $1 + 2 = 3$ small boxes.

Input

First-line contains an integer number N $(1 \leq N \leq 10^5)$(number of small boxes)

Next N lines contains two space-separated value $A[i], B[i]$ $(1 \leq A[i] \leq B[i] \leq 10^9)$. ($i^{th}$ line means $A[i]$ numbered big box contains a $B[i]$ numbered small box inside of it).

The next line contains an integer number Q $(1 \leq Q \leq 10^5)$(number of queries.)

The next Q line each contains two integer numbers X, Y $(1 \leq X \leq Y \leq 10^9)$.

constraints:

Output

You have to print Q line. Each line with an integer number. The answer to each query.

Samples

Input	Output
9 5 4 4 5 5 3 2 15 2 10 5 2 4 5 2 20 5 3 3 1 1 2 3 4 3	9 3 1

Input	Output
5 16 11 11 9 10 2 20 2 18 4 5 3 20 4 5 9 1 4 6 8 4	0 2 5 2 2

C. Ema and Her Garden

Limits 1s, 512 MB

In Bangladesh, there is a popular TV show on its national TV channel BTV named "Ityadi". In this show, trees are given as award to the participants which directly inspires gardening. Inspired from the TV show **Ema** shows interest in gardening. While planting trees for her garden, Ema wants to make sure that she gets a garden full of different trees in every row. Trees are tagged by a different ID with A to Z. You've given different types of row-based layout of the garden, help Ema to make the garden as she wants to be.

Input

Input contains a string layout **L** $(1 < |L| < 50)$ of ID of trees **A** to **Z**.

Output

Print "YES" without quotes if the layout fulfills Ema's requirement. Otherwise, print "NO" without the quotes.

Samples

Input	Output
ABCDE	YES

D. Nur's Case

Limits 1s, 512 MB

Ashikuzzaman Nur has a multi-national company. He has heard some allegations against the fake websites of his companies. So he wants to know the fake websites of his companies from a list and take a strong case against those websites. The list contains N websites names. Nur is too busy to find out the fake websites. You need to write a code to find those websites' names.

Consider this example:

"Alif.com"

"Al1f.com"

These two looks like the same, but here is a small difference first string has a 3rd character "i" and the second string has a 3rd character "1". As "i" and "1" are similar those websites are typosquat.

all similar character sets are given below:

{l,j,!}

{a,@,O,o,D,0,e}

{s,S,5,2}

{1,i,?}

Your task is to find websites those are fake and typosquat with Nur's website.

Input

first-line will contain a string S $(1 \le |S| \le 10^3)$, Nur's website name. Here $|S|$ means the length of string S. S doesn't contain any space.

second-line will contain an integer number N $(1 \le N \le 10^3)$, the number of website names will be given.

then N line of each will contain a string A_i $(1 \le |A_i| \le 10^3)$ fake website names. A_i doesn't contain any space.

Output

On the first line print an integer number C, the number of websites those are fake and typosquat with Nur's website.

Next line print C integers separated by space, the position of the fake website in the list (in ascending order).

Samples

Input	Output
alif.com 5 @lif.com al1f.com Alif.com aj1f.com D!?f.com	4 1 2 4 5

Input	Output
Ashik17@bdmail.com 6 ASHik17@bdmail.com Ashik17@BDmail.com Ashik?7obdmail.com AShik17@bdmail.com Ash!k@17bdmail.com Ashik17@xyzmail.bd	2 3 4

E. Unique String

Limits 1s, 512 MB

You may heard the name of vowels and consonants in English Alphabets. Well ! You may write words combining them in your school days. Now You've to identify a unique string. A unique string is a string that contains more than two vowels. See sample I/O for more clarifications.

Input

Input contains a sting of lowercase Latin letters S which has 10 letters at most.

Output

Print "YES" without quotes if the string is unique or print "NO" if it is not a unique string.

Samples

Input	Output
camelia	YES

F. Kodu's Average Number

Limits 1s, 512 MB

Kodu's friend Modhu gave him the following formula to generate a series. Modhu asked him if Kodu could find the $Average$ of first P numbers of the series.

$$N^{th} number = N^3 \left(\frac{9N - 3}{6N^2} \right)$$

Input

First line of input contains an integer number T $(1 \le T \le 10^5)$ (number of queries).

Each of the next T lines contains an integer $P(1 \le P \le 10^5)$.

Output

Print T lines of answer. The ith line contains the answer of the ith query.

Samples

Input	Output
1 3	6

For **P=3**, first 3 numbers of the series are 1, 5, 12. Their sum is 18 and hence their average is 18/3 = **6**.

Input	Output
2 5 3	15 6

For **P=5,** first 5 numbers of the series are 1, 5, 12, 22, 35. Their sum is 75. So their average is 75/5=**15**.

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