

ICT Hunger Games 2018

A. Let The Games Begin

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Let the Games Begin, and this is your very first task.

You are given two integers X and Y , you are required to write a program to compute their summation.

Please remember that you are required to exactly follow the input/output format, which means any additional printing than the required will gives you a *Wrong Answer* verdict.

Input

The first the only line of the input contains two integers X and Y , ($-10^6 \leq X, Y \leq 10^6$).

Output

Print in the only line of output one integer, The value of $X + Y$.

Examples

input	Copy
1 2	
output	
3	

input	Copy
4 7	
output	
11	

input	Copy
5 -6	
output	
-1	

B. The Secret Message

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Ehab has sent a secret message to his friend Omar. Now after Omar has received the message, he "As a security freak" wonders if it is really Ehab who sent the message or there is some man in the middle who hacked the network and pretend to be Ehab. To check whether it is Ehab or not, he has to search for the secret word that he and Ehab had agreed on to include in every message they send to each other.

The secret word they agreed upon is the word "*game*". Given the text message Ehab has sent to Omar, you are required to help Omar find if this message originates from Ehab or not. In other words does the message contain or does not contain the word "*game*" as a substring in the message.

Input

The first and only line of input contains a string S . The string consists of lowercase Latin letters and the length will be from 1 to 100 characters

Output

Print in the only line of output the word *Yes*, if the message came from Ehab and *No* otherwise.

Examples

input	Copy
letthegamesbegin	
output	
Yes	

input	Copy
maytheoddsbeeverinyourfavor	
output	
No	

C. The Driver

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Amer is a Microbus driver, but he is a very conservative man. He doesn't like males sitting next to females in his vehicle.



Amer's Microbus consists of three seats. The first one, the nearest to the driver's seat, consists of three spots for the passengers. The second one got three spots also. And the last one consists of four spots.

The passengers get into the microbus in order. Each passenger chooses a seat with at least one available spot and sits on the leftmost available spot in this seat.

Amer wants to know if it is possible for the microbus not to have any males sitting next to females.

Input

The first line of input will contain T ($1 \leq T \leq 1024$), the number of test cases. Each test case consists of string S of length 10, contains only F and M (Female and Male respectively), the leftmost character indicates the first to enter and the rightmost indicates the last to enter

Output

For each test case, print *Yes* if there's a way that satisfies Amer's requirement, *No* otherwise.

Example

input	Copy
3 FFFFMMMMM MMMMMMMMM MMMMMMMMM	
output	
Yes Yes No	

D. Mathematics for Computing I

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Sohieb is joining the *CSC1707* Mathematics for Computing class. In his first lecture he learned about the Factorial. In mathematics, the factorial of a non-negative integer n , denoted by $n!$, is the product of all positive integers less than or equal to n . For example,

$5! = 5 * 4 * 3 * 2 * 1 = 120$

Now Sohieb has to do some homework, and of course the homework is to compute the factorial of some number. However his teacher is a kind man so he only asked him to write how many trilling zeros this factorial contains. For example, $5! = 120$ so it contains only one trilling zero but $14! = 87178291200$ which contains two trilling zeros.

And of course as you all know, Sohieb is a super lazy student, so he asked you to help him solving this homework.

Input

The first the only line of the input contains a single integer number n , ($1 \leq n \leq 1000$).

Output

Print in the only line of output an integer, which is the number of trilling zeros for $n!$.

Examples

input	<div>Copy</div>
5	
output	
1	

input	<div>Copy</div>
1	
output	
0	

input	<div>Copy</div>
14	
output	
2	

input	<div>Copy</div>
26	
output	
6	

E. Abdelkarim and Sister

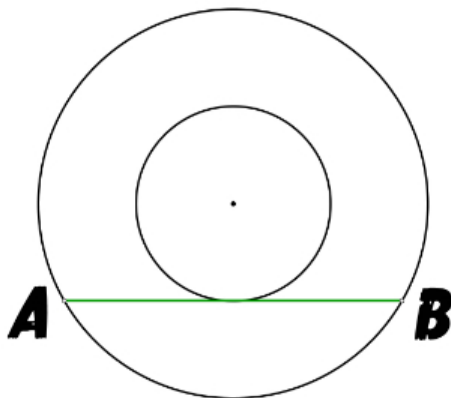
time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Abdelkarim was finally home after a long day. He was really tired and wanted to sleep when his little sister asked him this question. Given the area between 2 circles centered at the same point, find the length of the line segment that is a tangent of the inner circle and touches the perimeter of the outer circle. (i.e. the green line segment AB in the following picture).



Help him answer the question so that he could sleep.

Input

The first and only line of input contains a real number with 9 digits after the decimal point A ($0 \leq A \leq 10^9$) — the area between the two circles.

Output

Print a real number — the length of the line segment described above. The answer will be considered correct if the absolute or relative error does not exceed 10^{-9} .

Examples

input	Copy
1.000000000	
output	
1.128379167096	

input	Copy
100.000000000	
output	
11.283791670955	

F. Reducing Salary

time limit per test: 2 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Sohieb started working at `Hogwarts School of Witchcraft and Wizardry`. Ibrahim The school headmaster told him that he will get a positive integer salary equals X , then Ibrahim made a spell that erase the right most digit of X every month.

For example if he gets $X = 1234$ in the first month, the second month he will get $X = 123$ and in the third month $X = 12$, and so on.

After a few months Sohieb realized that he didn't get a salary because X became *Zero*.

Sohieb now has a total money equals Y which is his salary for all the previous months, but he can't remember what was the value of X . Could you help him by telling him what value of X makes his total money equals Y .

Input

The only line of the input contains a single integer Y ($1 \leq Y \leq 10^{18}$)

Output

Print single integer — the value of X which makes the total money equals Y .

If there is many values of X holds print "*ManySolutions*" (without the quotes).

If there is no X makes the total money equal Y print -1.

Examples

input	Copy
1	
output	
1	

input	Copy
3000	
output	
2701	

input	Copy
565	
output	
-1	

Note

In the second sample, the value of X is 2701 which means Sohieb gets 2701 in the first month, 270 in the second month, 27 in the third month and 2 in the forth month. So he now has $Y = 2701 + 270 + 27 + 2 = 3000$.

G. Valentine Present

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Yousef wants to buy a valentine present for his girlfriend. So he went to the Number Shop to buy some number as a present for her. The shop owner offered him the Number X to buy, but Yousef wants the number to be pretty, and as everyone knows the Number is pretty if and only if it has exactly two divisors. So now yousef wants to know if the number X is pretty for not. Please help Yousef and tell him if he should buy the number or not.

Input

The first and the only line of input contains the integer X ($1 \leq X \leq 10^6$)

Output

In the only line of output print *Yes* if Yousef should buy the number for his girlfriend, and print *No* otherwise.

Examples

input	Copy
2	
output	
Yes	

input	Copy
7	
output	
Yes	

input	Copy
1	
output	
No	

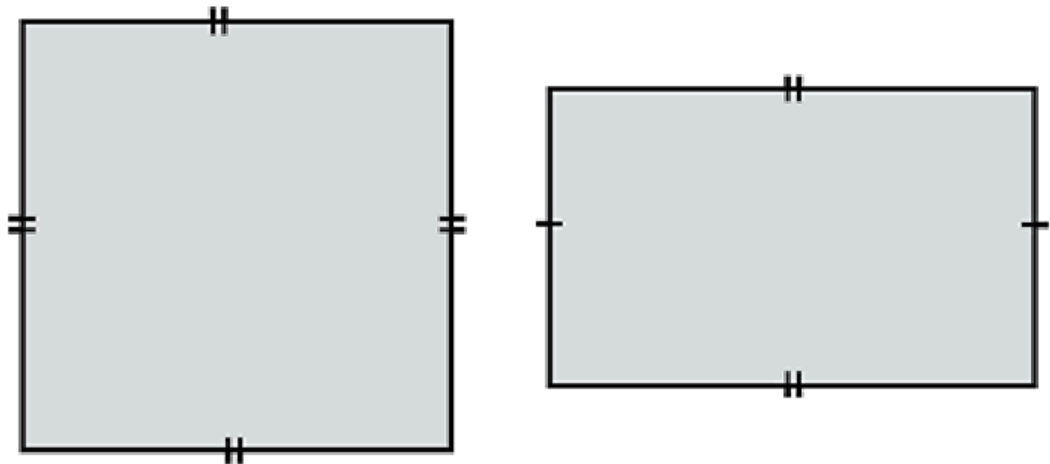
input	Copy
12	
output	
No	

H. Geometry

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Geometry is a very important field in mathematics, Squares and rectangles are essential shapes in geometry, both of them have 4 right angles, but a square is a special case of a rectangle where width and height are the same.

The figure below shows a square on the left and a rectangle on the right:



If you have the width and the height of a 4 right angled shape, can you figure out if it is a square or a rectangle?

Input

The first and the only line of input contains the two integers ($1 \leq w, h \leq 1000000$) representing width and height, respectively.

Output

Print one line consists of *Square* if the shape is a square, otherwise print *Rectangle* if it is a rectangle.

Examples

input	Copy
10 10	
output	
Square	

input	Copy
13 200	
output	
Rectangle	

input	Copy
300 300	
output	
Square	

I. Logo

time limit per test: 2.0 s
memory limit per test: 64 MB
input: standard input
output: standard output

As you may know the UNAL logo (see the figure) is pretty usable for everything in the UNAL documents, for this reason we ask you to make a simplified version of this logo for any size needed.



Formally, the simplified version of the logo of size m consist of an 'u' (composed by 3 lines of equal length) and a 'n' (composed by 3 lines of equal length) and there is exactly one space between the 'u' and the 'n', to simplify even more the logo each line is made just by the character '*' m times (wihtout quotation marks)

Input

A single number m ($3 \leq m \leq 50$), the size of the logo

Output

m lines with the resulting simplified logo of the UNAL

Examples

input	Copy
3	
output	
* * * * *	
* * * * *	
*** * *	

input	Copy
4	
output	
* * * * *	
* * * * *	
* * * * *	
**** * *	

J. Salem

time limit per test: 1.0 s

memory limit per test: 1024 MB

input: standard input

output: standard output

Salem is known to be one of the best competitive programmers in the region. However, he always finds a hard time understanding the concept of the hamming distance. The hamming distance of two numbers is defined as the number of different digits in their binary representations (leading zeros are used if necessary to make the binary representations have the same length). For example the hamming distance between 12 and 5 is 2 since their binary representations are 1100 and 0101 respectively and they differ in the first and fourth positions.

Recently, Salem got a problem that he needs your help to solve. He is given N integers and asked to get the maximum among the hamming distances of all possible pairs of the given integers.

Input

The first line of the input will be a single integer T representing the number of test cases. Followed by T test cases. Each test case will start with a line with single integer ($2 \leq N \leq 100$) representing the number of the integers. Each of the following N lines contains one of the integers ($1 \leq A_i \leq 10,000$) from the list of the integers.

Output

For each test case print one line consists of one integer representing the maximum hamming distance between all possible pairs from the given integers.

Examples

input

Copy

```
2
2
12
5
3
1
2
3
```

output

```
2
2
```

K. Fix the code

time limit per test: 2 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Sohieb is trying to study programming, but he always makes many mistakes with the brackets in his code. He needs your help to fix his code as fast as possible. He needs only 1 sec to change 1 character of his code to another one, so he asks you to tell him what is the minimum amount of time he needs to fix his entire code and how to do so.

To fix the brackets in the codes means to make it balanced, and the balanced string is either:

-) An empty string.
-) The concatenation of 2 balanced strings.
-) The concatenation of the string "[", a balanced string, and the string "]".
-) The concatenation of the string "(", a balanced string, and the string ")".

Input

The only line of the input contains a string representing the bracket sequence written in Sohieb's Code. The string will contain maximum 444 character and will only contain 4 types of characters '(', ')', '[' and ']'.

Output

If Sohieb can never fix his code print -1. Otherwise print the minimum amount of time needed to fix the code in the first line, then print how he can fix it as follows, each step in one line contains the position to be changed and the character that will be changed to. You can print them in any order, and if there are many correct solutions any of them will be accepted.

Examples

input

[(])

output

2
4]
3)

input

(

output

-1

input

([])

output

0

input

] [) (]] [(]))

output

5
1 (
11]
3 [
5 [
9]

L. Water Game

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Sohieb is playing a game with his friend Yosry. The game consists of T rounds. In each round i there is a_i cup of water and each one of the players has to drink a non-negative number of the cups. And Sohieb starts every round.

In each round Sohieb has to pick up a non-negative number x and then drinks x cups of water, then Yosry has to drink x^2 cups of the remaining water. If both Sohieb and Yosry succeeded to do his move then Sohieb will get x point on his score, but if at least one of them can not do his move (there isn't sufficient cups to drink) then Sohieb get $-x$ point on score.

Note that each round is independent. Which means any remaining cups from a round can not be used in any other rounds.

Can you tell after each round what is the maximum score Sohieb can has so far.

Input

The first line contains integer T ($1 \leq T \leq 2^{10}$) — The number of the rounds to be played.

Then T lines each contains a_i ($1 \leq a_i \leq 10^{18}$) — The initial number of cups in each round.

Output

Print T lines, the maximum score Sohieb can has after each round.

Examples

input	<div>Copy</div>
1 1	
output	
0	

input	<div>Copy</div>
3 6 5 10	
output	
2 3 5	

M. Duff and Meat

time limit per test: 1 second

memory limit per test: 256 megabytes

input: standard input

output: standard output

Duff is addicted to meat! Malek wants to keep her happy for n days. In order to be happy in i -th day, she needs to eat exactly a_i kilograms of meat.



There is a big shop uptown and Malek wants to buy meat for her from there. In i -th day, they sell meat for p_i dollars per kilogram. Malek knows all numbers a_1, \dots, a_n and p_1, \dots, p_n . In each day, he can buy arbitrary amount of meat, also he can keep some meat he has for the future.

Malek is a little tired from cooking meat, so he asked for your help. Help him to minimize the total money he spends to keep Duff happy for n days.

Input

The first line of input contains integer n ($1 \leq n \leq 10^5$), the number of days.

In the next n lines, i -th line contains two integers a_i and p_i ($1 \leq a_i, p_i \leq 100$), the amount of meat Duff needs and the cost of meat in that day.

Output

Print the minimum money needed to keep Duff happy for n days, in one line.

Examples

input	Copy
<pre>3 1 3 2 2 3 1</pre>	
output	
<pre>10</pre>	

input	Copy
<pre>3 1 3 2 1 3 2</pre>	
output	
<pre>8</pre>	

Note

In the first sample case: An optimal way would be to buy 1 kg on the first day, 2 kg on the second day and 3 kg on the third day.

In the second sample case: An optimal way would be to buy 1 kg on the first day and 5 kg (needed meat for the second and third day) on the second day.

N. Rectangles

time limit per test: 2.0 s
memory limit per test: 64 MB
input: standard input
output: standard output

You have N rectangles, all of their sides are either parallel to X axis or to Y axis, and you want to cover them all using one big rectangle.
what is the minimum area of the big rectangle you need in order to cover all the rectangles.

Input

The first line contains number of test cases T

Each test case consists of an integer N ($1 \leq N \leq 1000$), followed by N lines, each line describes a rectangle with four pairs of integers representing the X coordinate and Y coordinate of the vertices. - $1000 \leq Xcoordinate, Ycoordinate \leq 1000$

Output

For each test case print one integer which is the size of the rectangular cover.

Examples

input

Copy

```
2
1
1 1 2 2 2 1 1 2
2
0 0 10 5 0 5 10 0
0 1 1 1 1 0 0 0
```

output

```
1
50
```

O. palprime

time limit per test: 4.0 s
memory limit per test: 24 MB
input: standard input
output: standard output

A palindromic prime (sometimes called a palprime) is a prime number that is also a palindromic number. Palindromicity depends on the base of the numbering system and its writing conventions, while primality is independent of such concerns.

The sequence of binary palindromic primes begins(in binary):

11, 101, 111, 10001, 11111, 1001001 You are given a number b (in binary), you should output the first palprime greater than or equal to b .

Input

The input consists of multiple test cases, each test case consists of a number b in binary.

We guarantee b will be no Longer than 21 bits

Output

The first palprime greater than or equal to b

Examples

input	Copy
10 100 110 1000	
output	
11 101 111 10001	

P. Too Many Coins

time limit per test: 4.0 s

memory limit per test: 64 MB

input: standard input

output: standard output

Your friend has C coins in his pocket, each coin has a value V_i , and you know that he will not need that amount of money, he will only need M .

You want to help him not to carry all these coins, so you decided to tell him to take the coins of specific values, in a way that he will have at least the amount of money he needs.

You will tell him that it will be enough for him if he carried coins of types X_1, X_2, \dots, X_n .

Note that if you tell him to carry coins of type X_i , he will carry all the coins with values $V_i = X_i$.

Input

The first line contains an integer T representing the number of test cases.

Each test case consists of two lines, the first line has two integers C ($1 \leq C \leq 1000000$) and M ($1 \leq M \leq 10^9$), and the other line contains C integers representing the values of the coins ($1 \leq V_i \leq 1000000$).

Output

For each test case print the types of coins which your friend must carry, if there are multiple solutions, print the solution with the minimum number of types, if there are still multiple solutions print the one which makes your friend carry more money, if there are still multiple solutions print the solution with the bigger types.

print the types in increasing order. If he doesn't have enough money print "Impossible" without the quotations.

Examples

input

Copy

```
3
10 7
1 1 1 1 1 2 2 2 5 4
10 11
1 1 1 1 1 1 1 1 1 1
10 6
1 1 1 1 1 1 2 2 2 3
```

output

```
2 5
Impossible
2
```


Q. Card Game

time limit per test: 3.0 s

memory limit per test: 64 MB

input: standard input

output: standard output

You're playing a card game with K friends of yours, and since you're a champion in this game, they will play together and you will only play with the winner.

And now when they are playing your job is just to deal N cards and distribute them among your friends, you can choose how to distribute them, but the distribution should satisfy these rules:

- 1- Each player must have a continuous subsequence of the original set.
- 2- Each card must be dealt to some player.
- 3- Each player must have at least one card.

Note that it is not important that players have the same number of cards.

You know that all of them are playing using the same strategy so the player with the maximum card group power will win. Each card has a power P the power of group of cards is calculated as (the number of cards in that group) * (the maximum value in the same group).

Since the winner will play with you, and he will play using the same group of cards, you decided to minimize the power of his cards as much as you can.

Write a program to help you to do so.

Input

In the first line one integer T the number of test cases.

For each test case there will be two integers N and K ($1 \leq N \leq 1000000$, $1 \leq K \leq \min(N, 20000)$), then N integers representing the power of the cards in the original set and their order. ($1 \leq P_i \leq 1000000$).

Output

For each test case print a single line containing one integer which is the minimum group power you can make the winner player have.

Examples

input	Copy
1 10 3 1 2 3 4 5 6 7 8 9 10	
output	
25	

R. Paradise City

time limit per test: 1.0 s
memory limit per test: 256 MB
input: standard input
output: standard output

Noura has been looking for a restaurant to host the SCPC2015 celebration in Lattakia, she decided that the best method to pick a restaurant is according to the number of contestants that are living near it. Given a grid representing the map of Lattakia, each 3x3 cells represent a district, each district will consist of 3x3 areas. The center of each district is a restaurant (X), other cells can be:

- ‘.’ denotes an empty block.
- ‘*’ denotes a block full of people (4 persons)

Help Noura decide which restaurant to choose by finding the maximum number of students living in a district.

Input

The first line of input contains an integer T ($1 \leq T \leq 256$), the number of test cases.

The first line of each test case contains an integer N ($1 \leq N \leq 100$), the number of districts. Then follows three lines, each consists of $3 \times N$ characters, representing the map of the city of N districts.

Output

For each test case, print the maximum number of students living in a district on a single line.

Examples

input	Copy
<pre>3 3 ***...*** .X.*X*.X. ***...*** 2 *.*.*. .X..X* *.*.*. 3 .*...**** *X**X**X* ...*.*.*</pre>	
output	
<pre>24 16 28</pre>	

Note

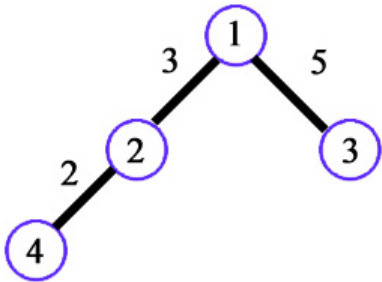
Warning: large Input/Output data, be careful with certain languages.

S. Frozen Rivers

time limit per test: 10.0 s
memory limit per test: 1024 MB
input: standard input
output: standard output

In winter, all small rivers of Al-Asi great river in Syria are frozen. But when spring comes back they start to melt. These small rivers are connected to each other exactly like a tree, each river (direct edge in the tree) has a value equal to the amount of ice in it.

Here is the tree of the sample test case:



When rivers start to melt, water starts to flow from node 1 (root of the tree) to any node that it can reach. When the water first reaches a node u , ice starts to melt in all its direct children edges at a rate of 1 unit per second. Once (u, v) edge completely melted, the rate of melting of all other edges that start from u will slow down to be 0.5 unit per second, while the other edges that start from v start melting with 1 unit per second.

Given the rivers tree, and a certain time, can you tell us how many leaves of the tree did the water reach? A leaf is a node that has no children.

Input

The first line contains T the number of test cases. For each test case, the first line contains N the number of nodes ($2 \leq N \leq 100,000$). Followed by $N - 1$ lines, each line describes the nodes 2 to N . Each line will contain 2 integers P_i and C_i ($1 \leq P_i \leq N$) ($0 \leq C_i \leq 100,000$) representing the parent of the i -th node (i starts from 2 here) and the amount of ice in the edge connecting the current node to its parent. Node 1 is the root of the tree. After that there is a line contains ($1 \leq Q \leq 100,000$), the number of queries. Then Q lines contain the times of these queries in seconds ($0 \leq \text{query time} \leq 10^{12}$).

Output

Print one line for each query in each test case, this line should contain the number of leaves that the water reached at the time of the query.

Examples

input	Copy
1 4 1 3 1 5 2 2 8 1 2 3 4 5 6 7 8	
output	
0 0 0 0 1 1 2 2	

Note

In the sample test case:

At time 0: water is at node 1

At time 1: water has melted 1 unit of edge (1, 2), and 1 unit of edge (1, 3)

At time 3: water has completely melted edge (1, 2). The rate of melting of (1, 3) drops to 0.5 unit/second, while edge (2, 4) starts to melt at rate 1 unit/second.

At time 5: water has completely melted edge (2, 4), and the remaining edge (1, 3) has 4 units melted, 1 to go.

At time 7: Ice completely melted in all edges.

T. Hey JUDgE

time limit per test: 1.0 s

memory limit per test: 256 MB

input: standard input

output: standard output

Since Judge Nicole Hosh moved to Egypt for her Computer Science Masters in AASTMT, in 2014, she has been training with coach Fegla and attending his camps in Egypt. She, also, set a number of problems for TCPC and JCPC and was a judge in LCPC and SCPC. Her best friend Noura was so proud of her so she was trying to convince her to start writing Codeforces Div. 2 round. After various attempts to convince her, Nicole finally agreed, and so, she started collecting some problems with different difficulties from her ex-contestant friends.

Judge Nicole collected 7 ideas for problems of different levels, she wants to create 5 problems for the next contest, one for each difficulty level, from A to E (difficulty 1 to 5). Given the difficulty level of the problems she currently has, she can merge the ideas of two problems, one of level x , and the other of level y to get a problem of level $x + y$.

For example, Judge Nicole can merge two problems of difficulties A and D, to get one problem of difficulty E ($1 + 4 = 5$).

Merging more than two problems into one will produce a problem with a long statement which is hard to explain, so she won't do this (i.e., each problem is merged with another at most once). Also, she can't merge a resultant problem again, and she can't use the same problem twice.

Input

The first line of input contains an integer T ($1 \leq T \leq 330$), the number of test cases.

Each test case will contain only one string S of length 7. Each letter of the string represents the difficulty level of a problem (from A to E), 'A' is the easiest and 'E' is the hardest.

Output

For each test case print "YES" if she can prepare a contest using the current problems, otherwise print "NO".

Examples

input	Copy
3 EBEABDA CEDEACA BDAAEAA	
output	
YES NO YES	

Note

Warning: large Input/Output data, be careful with certain languages.

U. Another Square in the Floor

time limit per test: 1.0 s

memory limit per test: 256 MB

input: standard input

output: standard output

While planning the SCPC2015 contest floor, each team has been assigned an area of a rectangular shape. The area covers the maximum region the team is allowed to move around during the contest.

When Noura saw the contest floor, she didn't like the rectangular shapes. She asked the organizers to reassign each team for a square shaped area instead of a rectangular one.

Given the sides of a rectangle, help the organizers find the square with minimum area, that covers the rectangle. To make it easier for the organizers, each side of the square must be parallel to one of the sides of the rectangle.

Input

The first line of input contains an integer T ($1 \leq T \leq 1024$), the number of test cases.

Each test case contains two space-separated integers X, Y ($1 \leq X, Y \leq 1000$), the dimensions of the rectangular shaped area.

Output

For each test case, print on a single line, the area of the square described in the problem statement.

Examples

input	Copy
3 3 3 5 7 12 6	
output	
9 49 144	

Note

Warning: large Input/Output data, be careful with certain languages.

V. Almost Palindrome

time limit per test: 1.0 s

memory limit per test: 256 MB

input: standard input

output: standard output

A string is considered palindrome if it's the same if you read it from the left or from the right (if it stays the same when you reverse it).

In this problem you are given a string, and your task is to swap 2 characters at different positions to make the string palindrome (note that you must do this step exactly once).

Input

The input contains just 1 line which is the string you are going to check, the string consists of at least 2 and at most 500,000 lower case English letters.

Output

Print "YES" if you can make the given string palindrome by applying the above step exactly once, otherwise print "NO".

Examples

input	Copy
ab	
output	
NO	

input	Copy
aba	
output	
YES	

input	Copy
axax	
output	
YES	

Note

In the second test case, you can swap the first and last characters (which won't make any change), and the string will stay palindrome.

P.S. The judge is cute enough today and didn't allow strings with length 1.

W. Lunch Break

time limit per test: 1.5 s

memory limit per test: 256 MB

input: standard input

output: standard output

Hasan decided to invite his colleagues and buy them lunch from his favorite restaurant. As usual, he got carried away and forgot to order early, for that he decided to help the delivery guy.

There are 3 different roads that the delivery guy can choose from. Given the length of each road, what is the best one that he can choose to deliver the food as soon as possible?

Input

The first line of the input contains an integer T ($1 \leq T \leq 10^5$), where T is the number of the test cases.

Each test case has one line that contains three **distinct** integers a , b and c ($1 \leq a, b, c \leq 10^9$), the lengths of the three different roads from the restaurant to Hasan's company.

Output

For each test case, print "First" (without quotations) if the delivery guy should choose the first road, "Second" (without quotations) if he should choose the second road, "Third" (without quotations) if he should choose the third way.

Example

input	Copy
3 5 10 7 20 3 9 8 15 2	
output	
First Second Third	

X. Longest Prefix

time limit per test: 2.0 s

memory limit per test: 256 MB

input: standard input

output: standard output

You are given two strings a and b . Find the longest common prefix between them after performing zero or more operation on string b . In each operation you can swap any two letters.

Input

The first line of the input contains an integer T ($1 \leq T \leq 500$), where T is the number of the test cases.

Each case has one line that contains two space separated strings a and b .

All strings are non-empty consisting of lowercase English letters only. The length of each of these strings does not exceed 10^5 characters.

Output

Print T lines, each line contains a single integer that represents the length of the longest common prefix between a and b .

Example

input

[Copy](#)

```
3
hello hey
here there
you me
```

output

```
2
4
0
```