Problem A. 111521. Royal Flush

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

You are in a casino, the croupier offers you to play. You started playing and there is given a sorted deck of cards numbered 1 to N. He shows you a trick:

- We pick up 1 card and put it on the back of the deck.

- Now, we pick up another card, it turns out to be card numbered 1, we put it outside the deck.

- Now we pick up 2 cards and put it on the back of the deck one by one.

- Now, we pick up another card and it turns out to be card numbered 2, we put it outside of the deck.

- ...

- We perform this steps till the last card.

Note, that at some step i the number of cards in the deck can be less than i, in this case some cards can processed several times, see notes. You are questioned if you can repeat that trick. Output initial arrangement of the deck if possible, or say if it is impossible.

Input

The first line of the input contains the number of test cases T ($1 \le T \le 100$), each of next T lines contain single integer N ($1 \le N \le 1000$) - the size of the deck for this test.

Output

For each test case, in separate line output n space separated integers - the order of the deck from top card to bottom if such arrangement of decks is possible, or -1 otherwise.

Examples

standard input	standard output
2	2 1 4 3
4	3 1 4 5 2
5	
3	3 1 4 5 2
5	4 1 6 3 2 5
6	4 1 6 3 2 5

Note

In the first test case of the first example the deck is processed as follows:

- initially deck is [2143],

- put one card at the back: [1432],

- take out 1: [432],

- put two cards at the back, one by one: [243],

- take out 2: [43],

- put three card at the back one by one: $[43] \rightarrow [34] \rightarrow [43] \rightarrow [34]$,

- take out 3: $[4]$,

- pretend to do smth then take out 4: $[]$.

Problem B. 187147. Nugman and Stack

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

One day Nugman was solving problems from LAB1 and he almost solved every problem in the laboratory work. Just one problem left that Nugman couldn't solve. Nugman asks for your help.

You are given N people in the queue, i-th person has age a_i. Queue starts at position 1. Each person wants to know if there is a younger person before him in a queue, in particular, the age of the closest person that is younger before him, otherwise print -1.

Input

The first line of input consists of a single integer $1 \le N \le 10^5$ that describes the number of people in the queue. The next line contains N integers $1 \le a_i \le 10^9$, which describes the age of people in the i-th position.

Output

Output N numbers separated by the whitespaces, where i-th number is the answer for the i-th person.

Examples

standard input	standard output
5 2 1 5 8 3	-1 -1 1 5 1
5 1 2 3 4 5	-1 1 2 3 4

Problem C. 153651. Equal strings

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Given two strings. Each string contains lower case English letters and the $\#$ symbol, which means you typed backspace. Check if two strings are equal.

Input

Input contains single line consisting of two strings s_1 ($0 \leqslant |s_1| \leqslant 10^5$) and s_2 ($0 \leqslant |s_2| \leqslant 10^5$) separated by the whitespace.

Output

Print single 'Yes' if they are equal or 'No' otherwise.

Examples

standard input	standard output
abc## a#b#a	Yes
ab#c ad#c	Yes
a#c bb##	No

Problem D. 151435. Balanced sequence of letters

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

You are given a string S containing lowercase Latin letters $[a-z]$. Determine if string is *balanced*.

Here is description of balanced strings:

- empty string is balanced

- if strings s and t are balanced, then string st (concatenation) is also balanced

- if string s is balanced, then string xsx is balanced for any lowercase Latin letter x.

For example, string *abba* is balanced, but string *abbb* is not.

Input

The input line contains single string S ($1 <= S.length() <= 10^5$).

Output

Print "YES" if string is balanced, otherwise print "NO"

Examples

standard input	standard output
sbaabsss	YES
sbabasss	NO
baab	YES
abpa	NO

Problem E. 153545. Boris vs Nursik

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Boris and Nursik play a drunkard card game. In the drunkard card game, all cards are divided equally between two players. Then they reveal one top card, and the one whose card is higher takes both of the revealed cards for himself, which are put under the bottom of his deck. The one who is left without cards loses.

The player who takes the cards for himself first puts the Boris's card under the bottom of his deck, then the Nursik's card (that is, the Nursik's card is at the bottom of the deck).

Write a program that simulates the drunkard card game and determines who wins. The game involves 10 cards with values from 0 to 9, the larger card wins the smaller one. The one special thing is that the card with a value of 0 wins card 9.

Input

The program receives two lines as input: the first line contains 5 numbers separated by spaces - the numbers of the Boris's cards, the second - Nursik's 5 cards. For simplicity, we will assume that all cards are different in value. The cards are listed from top to bottom, that is, each line starts with the card that will be opened first.

Output

The program must determine who wins, and output the word *Boris* or *Nursik*, then output the number of moves made before winning. If the game does not end within 10^6 moves, the program should output only *blin nichya*.

Example

standard input	standard output
1 3 5 7 9 2 4 6 8 0	Nursik 5

Problem F. 105787. Prime Numbers

Input file: standard input
Output file: standard output
Time limit: 1 second
Memory limit: 256 megabytes

Just print n-th prime number.

Input

Given an integer N ($1 <= N <= 1000$).

Output

Print n-th prime number.

Example

standard input	standard output
5	11

Note

Note that 100th prime number is not equal to 100.

Problem G. 149557. Vanya and Primes 2

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	256 megabytes

On the previous quiz, you needed to find n-th prime for Vanya. I think it was very easy, so let's make it a little harder. You need to find a prime whose index is n-th prime. As an example prime numbers is: 2, 3, 5, 7... have indexes 1,2,3,4... so 2 and 3 indexes are primes too, therefore we have sequence of "superprimes"like: 3, 5, 11, 17... Find n-th superprime.

Input

Integer n. (1<=n<=100)

Output

N-th superprime

Examples

standard input	standard output
1	3
2	5
3	11
5	31

Problem H. 140306. Prime or not

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Asman is very curious and likes to check whether some number is prime or not. Check if the number is prime. A prime number is a number that has only 2 divisors, it is 1 and the number itself.

Input

The only line of the input contains one integer a ($1 \leq a \leq 10^6$).

Output

Print "YES" (without quotes) if the number is prime. Otherwise print "NO" (without quotes)

Examples

standard input	standard output
1	NO
10	NO
2	YES
97	YES

Problem I. 197984. Classroom of the Elite

Input file:	standard input
Output file:	standard output
Time limit:	1 second
Memory limit:	256 megabytes

In class A, students want to establish a class leader. The class splitted into two fractions: Sakayanagi and Katsuragi. They decided to decide the leader by the following procedure:

1. Each of n students makes a statement. They make statements one by one starting from student 1 and finishing with student n. If student were kicked from the procedure, he/she is skipped.

2. When student makes a statement, he/she can kick any other student from procedure. If someone is kicked from procedure he no longer participates in the procedure till the very end.

3. When the round is finished, i.e. all students are done with their statements, the procedure repeats from step 1.

4. The process repeats until there is only one student eligible to participate and this student becomes the group leader.

Determine the fraction of the group leader, if both fractions play optimally (i.e. both fractions act best they can to make the group leader from their fraction).

Input

The first line contains a single integer n ($1 \le n \le 200000$) — the number of students in class A. The next line contains n characters. The $i - th$ character is 'S' if the $i - th$ student votes for Sakayanagi or 'K' if votes for Katsuragi.

Output

Print single line: the name of the fraction without quotes.

"SAKAYANAGI" — if Sakayanagi will win.

"KATSURAGI" — if Katsuragi will win.

Examples

standard input	standard output
4 KSKS	KATSURAGI
5 SSKKK	SAKAYANAGI

Problem J. 77223. Deque

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	256 megabytes

Zhansaya wants to find the sum of first and the last number of her deque. If she tired she shows the character '!' , if she wants to add a number to the begin she shows '+', and if she wants to add to the back , shows character '-' and if she shows '*', you have to find the sum of first and last elements and delete elements. Help her to solve this problem.

Input

You are given characters '+' , '-', '!' , '*' , and numbers.

Output

For '*' query print the answer to the problem. Note that if deque is empty print "error".

Examples

standard input	standard output
+ 1 - 9 + 2 * + 2 - 6 + 3 - 9 * * * * !	11 12 8 2 error
+ 1 + 2 - 9 - 2 * !	4