Problem A. 187089. Nearest number

Input file:	`standard input`
Output file:	`standard output`
Time limit:	3 seconds
Memory limit:	256 megabytes

You are given list of integers and an integer k. Find nearest to k number in the list. Distance between numbers is defined as absolute value of their difference. If there are multiple such numbers, choose the first one.

Input

The first line of input contains an integer n, number elements in the list ($1 \leq n \leq 10^6$). Next line contains n integers, values of the list ($-10^8 \leq a_i \leq 10^8$). The last line contains an integer k ($-10^8 \leq k \leq 10^8$).

Output

Print the offset from the head of list of the nearest to k number from the list. If there are multiple answers, choose the first one (with smaller offset).

Examples

standard input	standard output
6 7 8 -10 4 2 -1 5	3
3 1 2 3 -10	0
5 1 1 1 1 1 1	0
6 1 2 90 32 2 2 10	1

Note

In the first example, the closest number to 5 is 4, which offset is 3.

In the second example, the closest number to -10 is 1. Its offset is 0.

In the third example, distance to k is equal for all numbers of the offset. So we will take first of them (with offset 0).

In the last example, the closest number to 10 is 2, so we take the offset of its first occurrence – 1.

Problem B. 140554. Jonathan the Poet

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

Jonathan the Poet has finished his new poem recently. But something went wrong and now he thinks that rhyme could be better. He believes that applying cyclic shift by K positions will fix the problem. Jonathan's new poem is a sequential list of words. Jonathan is tired and asked your help to find such cyclic shift.

To clarify, you are given a poem of N words as a single linked list. Your task is to write function that shifts linked list by K positions and returns the head of new linked list.

Input

The first line contains two integers N and K ($1 \leqslant K < N \leqslant 10^5$) - number of words in the poem.

The second line contains N words that consist of lowercase latin letters. It is guaranteed that the total length of all words does not exceed $3 \cdot 10^5$.

Output

If your function is implemented correctly, program will print the poem with order of words shifted by K positions.

Examples

standard input	standard output
5 2 the show must go on	must go on the show
5 3 another one bites the dust	the dust another one bites

Problem C. 103877. Kuanyshbek

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

Solve this problem with linked list.

Kuanyshbek studied how multithreading works in operating systems. He wrote code that runs a single thread, which writes to a single file. Due to sloppiness, he launched two threads with different parameters that write to the same file. Since the OS allows only one thread to write data to a file in a single time, they worked synchronously. Kuanyshbek needs data from the first stream, help him delete the data of the second stream. To understand the whole situation you need to simulate the recording process. Implement your linked list, add items, and delete each second element. Kuanyshbek believes in you, good luck!

Input

In the first line, you will be given integer N – amount of elements after threads finished writing. In the second line, will be given N integers. $1 < N < 100$;

Output

Output in a single line elements of an array after erasing divided by single empty space.

Example

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

Problem D. 143619. List modes.

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

You are given a list of integer numbers. Print its mode. Mode is the number that occurs most frequently in the list. If there is several modes, print them in descending order.

Input

The first line of the input contains integer number n $(1 \le n \le 1000)$ elements in the list. In the next line you are given $a_1, a_2, ..., a_n$ - elements of the list. $(1 \le a_i \le 1000)$.

Output

Print list's mode(-s) in descending order.

Examples

standard input	standard output
10 1 2 2 9 8 9 6 6 7 6	6
7 1 9 4 8 2 8 1	8 1
6 9 20 64 7 3 92	92 64 20 9 7 3
5 1 1 1 1 1	1

Problem E. 106183. Database.

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

KBTU has a database crash. That's why the list of all students is now wrong. Some names of this list were duplicated. Due to the nature of crash, it is known that duplicates of the same name occupy subsequent positions in the list. For instance, name "Dana" may occupy positions $2, 3, 4$, but cannot occupy positions $2, 3, 5$ since these positions are not consequent. Help teachers to get rid of these duplicates.

Input

You are given an integer N $(1 \leq N \leq 10^5)$; - number of names. Then in the next N lines there are names, each in separate line.

Output

Show how many students we have and print all these student's name line by line. By completing the template it is done automatically.

Examples

standard input	standard output
1 wow	All in all: 1 Students: wow
2 wow wow	All in all: 1 Students: wow
2 wow kek	All in all: 2 Students: kek wow
3 wow wow kek	All in all: 2 Students: kek wow
3 kek wow wow	All in all: 2 Students: wow kek

Problem F. 103826. Insertion of Node.

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

You're given a linked list A, an integer *data* to add to the list and the position at which the integer must be inserted. Create a new node with the given integer, insert this node at the desired position.

A position of 0 indicates head, a position of 1 indicates one node away from the head and so on.

As an example, if your list starts as $1 \to 2 \to 3$ and you want to insert a node at position 2 with $data = 4$, your new list should be $1 \to 2 \to 4 \to 3$

Input

The first line contains an integer n, the number of elements in the linked list.

Each of the next n lines contains an integer a_i.

The next line contains an integer *data* denoting the data of the node that is to be inserted.

The last line contains an integer *position*.

constraints

• $1 \le n \le 1000$

• $1 \le a_i \le 1000$, where a_i is the ith element of the linked list.

• $0 \le position \le n$.

Output

Return a reference to the list head. Locked code prints the list for you.

Example

standard input	standard output
3 16 13 7 1 2	16 13 1 7

Problem H. 195823. Zoro and Seven Sword Style.

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1.5 seconds
Memory limit:	256 megabytes

THE CODE TEMPLATE IS IN THE NOTE BELOW.

Zoro got lost again, this time in the maze. Walking along a random corridor, he stumbles upon a mysterious door, which says that this is the exit from the maze. The door mechanism works on specific functions for the linked list. But due to the fact that the door is very old, the functions have been erased. Zoro discovered an ancient stone paneglyph nearby, which lists about each function:

1. inserts - add a node on position p.

2. remove - remove the node from position p.

3. print - print all values of list separated by a space.

4. replace - move the node from position p1 and to position p2. Position p2 is considered at the moment after its removal.

5. reverse - reverse the entire list.

6. cyclic_left - do a cyclic shift to the left x times.

7. cyclic_right - do a cyclic shift to the right x times.

Also, there are indicated the commands that need to be executed in order for the door to open. It is known that each command calls a specific function. Help Zoro to restore functions.

Input

Each line of input starts with integer which indicates command:

- If command 0, exit the program.

- If command 1, then the same line of input contains numbers x ($0 \le x \le 10^6$) and p ($0 \le p$). Add a new node with value x to the position p. It is guaranteed that p does not exceed the length of the list.

- If command 2, then the same line of input contains number p ($0 \le p$). Delete the node from position p. It is guaranteed that p is less than the length of the list.

- If command 3, print the whole list. Print -1 if list is empty.

- If command 4, then the same line of input contains numbers p1 and p2 ($0 \le p1, p2$). Move node from position p1 to position p2. Position p2 is counted from the moment when we have already retrieved the node from position p1. It is guaranteed that p1 and p2 are less than the length of the list.

- if command 5, reverse whole list.

- If command 6, then the same line of input contains number x. Make left cyclic shift x ($0 \le x$) times. It is guaranteed that x is less than the length of the list.

- If command 7, then the same line of input contains number x. Make right cyclic shift x ($0 \le x$) times. It is guaranteed that x is less than the length of the list.

Subtasks

1. (20%) Implement each function in $O(N^2)$ or faster.

2. (20%) Implement functions inserts, remove, print and replace in $O(N)$.

3. (20%) Implement functions inserts, remove, print and reverse in $O(N)$.

4. (20%) Implement functions inserts, remove, print, cyclic_left and cyclic_right in $O(N)$.

Output

For each command print, print all values of list separated by a space.

Note

Each function except print must return the head of the linked list.

CODE TEMPLETES

C++ : https://pastebin.com/BAG1n8Kp

Python : https://pastebin.com/9mwkZnEh

Java : https://pastebin.com/jfhpYWYR

Just leave it to luck

— Roronoa Zoro, *One Piece*

Examples

standard input	standard output
1 0 0	0
3	1 0
1 1 0	1 0 2
3	1 0 2
1 2 2	0 1 2
3	0 1 3 2
4 0 0	3 0 1 2
3	3 2 0 1
4 0 1	3 2 1 0
3	
1 3 2	
3	
4 2 0	
3	
4 3 1	
3	
4 2 3	
3	
0	
1 0 0	0 1 2 3
1 1 1	3 2 1 0
1 2 2	0 1 2 3 4
1 3 3	
3	
5	
3	
1 4 0	
5	
3	
0	
1 0 0	0 1 2 3
1 1 1	0 1 2 3
1 2 2	3 0 1 2
1 3 3	0 1 2 3
3	2 3 0 1
7 0	2 3 4 0 1
3	1 2 3 4 0
7 1	3 4 0 1 2
3	
6 1	
3	
6 2	
3	
1 4 2	
3	
6 4	
3	
7 3	
3	
0	

Problem I. 103500. Doubly linked list.

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

In this problem you need to complete the template https://paste.ubuntu.com/p/hMJK6v55br/**.**

Implement the doubly linked list data structure. The program reads a sequence of command, performs one or another operation. The linked list stores the names of books.

Possible commands for the program

- *add_front* Add a new book to the beginning of the linked list. The program should output "ok"

- *add_back* Add a new book to the end of linked list. The program should output "ok"

- *erase_front* Erase the first book in the linked list. The program should output name of erased book

- *erase_back* Erase the last book in the linked list. The program should output name of erased book

- *front* Print the name of the first book.

- *back* Print the name of the last book

- *clear* Erase the all books in the linked list. The program should output "ok"

- *exit* The program should output "goodbye" and exit

Example

standard input	standard output
add_front Harry_Potter	ok
add_back Light	ok
erase_front	Harry_Potter
erase_back	Light
erase_front	error
add_front Happy	ok
back	Happy
add_back Autumn	ok
add_front Alchemy	ok
clear	ok
front	error
exit	goodbye

Problem K. One-time guests

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

Jojo given an input stream of N characters consisting only of lowercase latin letters. After each input character, output first (or leftmost) non-repeating characher The task is to find the first (or leftmost) non-repeating character each time a character is inserted to the stream. If no non-repeating element occur, then print -1. Help Jojo to solve this problem.

Input

The first line of input contains an integer T denoting the no of test cases. Then T test cases follow. Each test case contains an integer N denoting the size of the stream. Then in the next line are x characters which are inserted to the stream.
Constraints:
$1 <= T <= 200$
$1 <= N <= 500$

Output

For each test case in a new line print the first non repeating element for each new character added to stream, separated by the spaces. If no such element occur print -1.

Examples

standard input	standard output
2 4 a a b c 3 a a c	a -1 b b a -1 c
1 6 a d b c a a	a a a a d d

Problem L. Ragnarok

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

You are given an array a ($-1000 \leq a_i \leq 1000$) of length $n (1 \leq n \leq 100)$ in linked list form. Find non-empty subarray of a (range of consequent elements) of maximal sum.

Input

Look at Notes section

Output

Look at Notes section

Examples

standard input	standard output
5 1 2 -1 4 5	11
3 -1 -1 -1	-1
10 5 1 2 -10 5 3 9 -5 10 10	32

Note

Take one of the templates from links given below and implement the function findMaxSum().

C++: https://ideone.com/j1t24c

Python3: https://ideone.com/g4kkKm

You can't convert linked list to array, doing this will result in 0 points.