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 ($1 \le n \le 10^6$). Next line contains n integers, values of the list ($-10^8 \le a_i \le 10^8$). The last line contains an integer k ($-10^8 \le k \le 10^8$).

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 believe 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

Note

Go to the link

`https://pastebin.ubuntu.com/p/RkfQ7d9P2w/`, if you use `C++`,

`https://pastebin.ubuntu.com/p/YDDCMqbkjk/`, if you use `Python`,

and take already written code from there. Your only task is to implement function

`cyclicShift(Node* head, int k)`, if you use `C++`,

`cyclic_shift(head, k)`, if you use `Python`.

Problem C. 103877. Kuanyshbek

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

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

Elements that will be stored 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 ($1 \leq n \leq 1000$) elements in the list. In the next line you are given $a_1, a_2, ..., a_n$ - elements of the list. ($1 \leq a_i \leq 1000$).

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. All names of this list were repeated(duplicated). Now you have a class named "Database". Because of you are beginner just help to get rid of this duplicated.

Input

You are given an integer N; N-number of names. Then in the next line it has names.

Output

Show how many students we have and print all these student's name line by line.

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. 103500. Linked list.

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

Implement the 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

Finish writing the functions that are below

https://paste.ubuntu.com/p/hMJK6v55br/

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 G. 160416. Height checker.

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

The semester is over, so assistants asked students to stand in non-decreasing order of heights to take a photo. Your task is to find the minimum number of students that must move in order for all students to be standing in non-decreasing order of height. Notice that when a group of students is selected they can reorder in any possible way between themselves and the non selected students remain on their seats.

Input

You are given an integer array.

Output

Print the minimum number of students that must move.

Examples

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

Note

In the first example, current array : [1, 1, 4, 2, 1, 3]. Target array : [1, 1, 1, 2, 3, 4] On index 2 (starting from 0) we have 4 vs 1 so we have to move this student. On index 4 we have 1 vs 3 so we have to move this student. On index 5 we have 3 vs 4 so we have to move this student.

Problem H. 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

- $1 \leq n \leq 1000$
- $1 \leq a_i \leq 1000$, where a_i is the i^{th} element of the linked list.
- $0 \leq position \leq n$.

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 I. 195823. Zoro and Seven Sword Style.

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

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.

THE CODE TEMPLETE IS IN THE NOTE BELOW.

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 ($0 \leq x \leq 10^6$) and p ($0 \leq p$). 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 ($0 \leq p$). 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 ($0 \leq p1, p2$). 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 ($0 \leq x$) 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 ($0 \leq x$) 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 3 1 1 0 3 1 2 2 3 4 0 0 3 4 0 1 3 1 3 2 3 4 2 0 3 4 3 1 3 4 2 3 3 0	0 1 0 1 0 2 1 0 2 0 1 2 0 1 3 2 3 0 1 2 3 2 0 1 3 2 1 0
1 0 0 1 1 1 1 2 2 1 3 3 3 5 3 1 4 0 5 3 0	0 1 2 3 3 2 1 0 0 1 2 3 4
1 0 0 1 1 1 1 2 2 1 3 3 3 7 0 3 7 1 3 6 1 3 6 2 3 1 4 2 3 6 4 3 7 3 3 0	0 1 2 3 0 1 2 3 3 0 1 2 0 1 2 3 2 3 0 1 2 3 4 0 1 1 2 3 4 0 3 4 0 1 2

Problem J. 194847. Find the lost number.

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

You're given a list of numbers `nums`, which contains distinct numbers in range [0, nums.size()]. But there is a problem - one number is missing from the list. Find this number and print it.

Input

The first line of input contains an integer n, size of the list ($1 \leq n \leq 10^4$). Next line contains n unique integers, values of the list ($0 \leq a_i \leq 10^4$).

Output

Print the missing number.

Examples

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

Note

In the first example, since there're 3 numbers, so all numbers are in the range [0, 3]. 2 is the missing number in the range since it does not appear in the list.