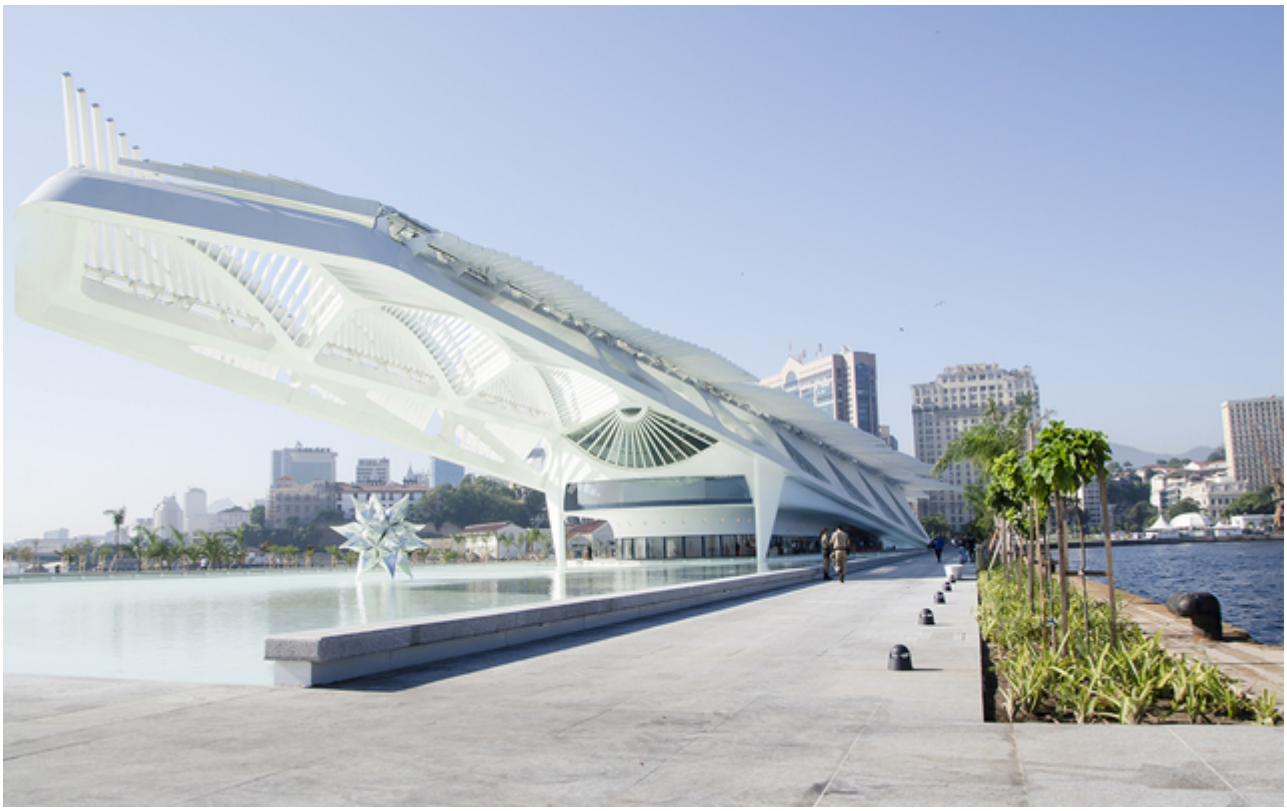
# Permutation and reverse

Max. Marks: 100

The Museum of Tomorrow (Museu do Amanhã) is a science museum in the city of Rio de Janeiro, Brazil. The main exhibition takes visitors through five main areas: Cosmos, Earth, Anthropocene, Tomorrow and Now via a number of experiments and experiences. The museum mixes science with an innovative design to focus on sustainable cities.



Today, manager of the museum is planning to conduct a quiz in which visitors can participate and win free ticket to the museum.

There are $n$ cards on the table and each card has a unique integer ( from $1$ to $n$ ) written on it. The cards represent a permutation $p$ of size $n$. A visitor can perform many operations. In one operation, a visitor will select a continuous segment of cards and reverse the order of the cards. The task is to convert $p$ into identity permutation ( i.e. all the cards have to be in strictly increasing order ).

To decide the winner of the quiz, the manager will give a score to the sequence of operations. The score will depend on the length of continuous segments the visitor will select and another permutation $a$ of size $n$.

The score is computed in the following way:

Let's define a sequence of lengths of all the continuous segments selected by a visitor as $lens$ and an infinite sequence $b$: $b_i = a_{i \mod n}$. Consider a sub-sequence of $b$ which is equal to $lens$ and have the smallest position of the last element. Let the smallest possible position of last element be $pos$. Then, the score of the operation will be $10^5 \cdot \frac{n^2}{pos+1}$.

The visitor who's score is maximum will win and will get a free ticket to the museum.

**Input format**

The first line of input contains the single integer $n$ ($1 \le n \le 100$).

The second line of input contains $n$ integers $p_i$ ($1 \le a_i \le n$) - permutation $p$.

The third line of input contains $n$ integers $a_i$ ($1 \le a_i \le n$) - permutation $a$.

**Output format**

In the first line of input print single integer $q$ ($0 \le q \le 10^5$) - number of operations.

Then print $q$ lines. In the $i$-th of them print two integers $l_i$ and $r_i$ ($1 \le l_i \le r_i \le n$) - continuous segment of cards which you want to reverse.

Note that $lens_i = r_i - l_i + 1$.

**Scoring**

*This is approximate problem and total score is sum of score of all test-cases and points of a solution is scaled based on best solution.* Details of scoring is mentioned above.

**Tests**

There are $100$ tests. For each test independently: $n$ was generated randomly from interval $[90, 100]$. After both $p$ and $a$ were generated randomly.

After contest ending we will add $100$ more random tests in same manner but with new seeds.

SAMPLE INPUT

```
3
3 1 2
2 1 3
```

SAMPLE OUTPUT

```
3
1 3
1 2
1 1
```

**Explanation**

$lens = (3, 2, 1)$

$b = (2, 1, 3, 2, 1, 3, 2, 1, 3, \dots)$

Find the subsequence: $(2, 1, [3], [2], [1], 3, 2, 1, 3, \ldots)$. So $pos = 5$ and score for this test will be $10^5 \cdot \frac{3^2}{5+1} = 150000$.

| | |
|---|---|
| **Time Limit:** | 2.0 sec(s) for each input file. |
| **Memory Limit:** | 512 MB |
| **Source Limit:** | 1024 KB |
| **Marking Scheme:** | Marks are awarded if any testcase passes. |
| **Allowed Languages:** | C, C++, Clojure, C#, D, Erlang, F#, Go, Groovy, Haskell, Java, Java 8, JavaScript(Rhino), JavaScript(Node.js), Lisp, Lisp (SBCL), Lua, Objective-C, OCaml, Octave, Pascal, Perl, PHP, Python, Python 3, R(RScript), Racket, Ruby, Rust |

## CODE EDITOR

Enter your code or Upload your code as file. Save C (gcc 5.4.0)

```c
#include <stdio.h>

int main()
{
    printf("Hello World!\n");
    return 0;
}

```

4:1

Provide custom input

*Press Ctrl-space for autocomplete suggestions.*

COMPILE & TEST SUBMIT

**Tip:** You can submit any number of times you want. Your best submission is considered for computing total score.

Your Rating:



COMMENTS (44) SORT BY: Relevance

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**kashish miglani** Edited 2 days ago

can someone plz tell
why have we used 3 moves .
1 3
1 2
alone are sufficient i guess.
what is the need of counting 1 1 ?

10 votes ● Reply ● Message ● Permalink

LIVE EVENTS

**kashish miglani** 2 days ago

@moderator reply asap.

0 votes ● Reply ● Message ● Permalink

**mcfx** 2 days ago

It's not necessary. Sample output isn't the best solution

4 votes ● Reply ● Message ● Permalink

**kashish miglani** 2 days ago

Oh ok ! i got it , thanks alot.

0 votes ● Reply ● Message ● Permalink

**Atul Rana** a day ago

This comment has been deleted.

● Reply ● Message ● Permalink

**Vishal Anand** a day ago

how did you come with sequence, can you pls explain [ 2 , (1 , 3 ,) 2,1,3,..]

0 votes ● Reply ● Message ● Permalink

**Atul Rana** a day ago

This comment has been deleted.

● Reply ● Message ● Permalink

**Utkal Sinha** a day ago

if I am taking mod (n) then b each element of b can have a max of n-1 but how come the sequence b has n value elements? for example, n in given example is 3 then how come b has 3 in the sequence?

1 vote ● Reply ● Message ● Permalink

**Nisarg Bakshi** 19 hours ago

i thought the same way bro

0 votes ● Reply ● Message ● Permalink

**Katalin Branyine Sulak** 12 hours ago

Consider array a indexed from 0. Actually b is simply the unfinite number of copies of array "a" after each other. (Of course you will need it until k copies at most, if you have a lens array with k elements.)

0 votes ● Reply ● Message ● Permalink

**Prince Batra** a day ago

yes only two operations are sufficient for sample case

1 vote ● Reply ● Message ● Permalink

**Kunal Goyal** a day ago

can anyone explain the problem by taking an example?

0 votes ● Reply ● Message ● Permalink

**Prince Batra** a day ago

example
Input
6
2 4 9 7 6 5
1 2 3 4 5 6
so you have to apply operation on first array so that it can be arrange in increasing order i.e first array become 2 4 5 6 7 9.....and opration you can perform is you can reverse the array from one position to another so that it become increasing...and in output you have to tell firstly the total no. of operation you use to make it in increasing order(say it take x operation ) ans in next x lines you have to print the left position and right position for each operation you perform. The marking for this is based on best submission and for getting max. marks you have to use less no. of operation.
Hope it help

▲ 2 votes ● Reply ● Message ● Permalink

**Utkal Sinha** Edited a day ago

Then what is the use of second array? For example, I understood that (2 4 9 7 6 5) needs to be sorted, but what is the use of the next array (1 2 3 4 5 6) in your case?

▲ 3 votes ● Reply ● Message ● Permalink

**Shadow007** 20 hours ago

Can the integers in the first array be greater than n?

▲ 0 votes ● Reply ● Message ● Permalink

**KARAN RAWAT** 12 hours ago

bro you have taken the wrong example , it is clearly written that 1<=ai<=n and 1<=pi<=n, so if you are taking n=6...then
you sample input can be
6
2 4 3 1 5 6
2 1 5 4 3 6
now you have to find answer .....

▲ 2 votes ● Reply ● Message ● Permalink

**Anurag Bhattacharya** an hour ago

what would be the answer?

▲ 0 votes ● Reply ● Message ● Permalink

**KARAN RAWAT** an hour ago

answer depends upon your algorithm , and the use of array a

▲ 1 vote ● Reply ● Message ● Permalink

**Anurag Bhattacharya** Edited 37 minutes ago

I cannot create an algorithm as I cannot understand the line "B:Bi = Ai mod n"
and also how to determine the lens?

▲ 0 votes ● Reply ● Message ● Permalink

**Jaime ARDP** 25 minutes ago

are there multiple searches then ?? and I choose the most optimal?

▲ 0 votes ● Reply ● Message ● Permalink

**Anurag Bhattacharya** 23 minutes ago

most probably not, as this would give time limit error in almost every test case

▲ 0 votes ● Reply ● Message ● Permalink

**Jaime ARDP** 14 minutes ago

but there it says, choose the one with the highest score

▲ 0 votes ● Reply ● Message ● Permalink

**Bhavya Jain** 2 days ago

can anyone please explain the question
Thanks in advance

▲ 3 votes ● Reply ● Message ● Permalink

**KARAN RAWAT** 2 days ago

you need to arrange the array p in increasing order, with the help of the operation that .....you can select the continuous segment and reverse the order of the array ..you can apply as many operations you want and at last

you need to print the number of operations used and print two integers li and ri (1≤li≤ri≤n) - continuous segment of cards which you want to reverse.
This is approximate problem and total score is sum of score of all test-cases and points of a solution is scaled based on best solution. Details of scoring is mentioned above.
▲ 4 votes ● Reply ● Message ● Permalink

**Bhavya Jain** 2 days ago
Thanks
▲ 0 votes ● Reply ● Message ● Permalink

**abhishek vanjani** a day ago
scoring???
how is second array used in scoring??
▲ 0 votes ● Reply ● Message ● Permalink

**KARAN RAWAT** a day ago
second array is used to find pos which is further used for calculating score
▲ 0 votes ● Reply ● Message ● Permalink

**thepurpleowl** 13 hours ago
what is "approximate problem"?? Is there some specific meaning of the term??
▲ 0 votes ● Reply ● Message ● Permalink

**Abu Rayhan Ahmad** Edited a day ago
can anyone please explain the sample test case .
i have no idea what problem setter written on this problem... :'(
plz someone explain the problem..
▲ 2 votes ● Reply ● Message ● Permalink

**Tayron Lee** a day ago
You could sort the sample permutation by reversing 1-2 and then 2-3. In this case both operations would have a length of 2, and the sequence (2, 2) is obviously not equal to any subsequence of b. Should I assume this solution gets no points?
▲ 0 votes ● Reply ● Message ● Permalink

**Katalin Branyine Sulak** a day ago
lens (as an array) is not necessarly continuous part of b.
▲ 1 vote ● Reply ● Message ● Permalink

**Rathin Bhargava** a day ago
Thanks! Finally understood it!
▲ 0 votes ● Reply ● Message ● Permalink

**Yusy** 5 hours ago
"Consider a sub-sequence of b which is equal to lens and have the smallest position of the last element" what does it mean if my lens array is [2,2] in this case my sub sequence of b will not be equal to lens right?
▲ 0 votes ● Reply ● Message ● Permalink

**Katalin Branyine Sulak** Edited 28 minutes ago
b=[2,1,3,2,1,3,2,1...] lens=[2,2]
a possible subseq=[b[3],b[9]]
best lastpos subseq=[b[0],b[3]] (actually I don't know wether it is pos=3 or pos=4 for the score, but makes no difference: the lower is the pos, the higher is the score]
▲ 0 votes ● Reply ● Message ● Permalink

**shivam gupta** a day ago
The cards represent a permutation p of size n.
what is its meaning
▲ 1 vote ● Reply ● Message ● Permalink

**Gunda Shiva Kumar** 17 hours ago
Can anyone explain the use of second array?
And also how output is formed ?
▲ 1 vote ● Reply ● Message ● Permalink

**Utkal Sinha** a day ago

what is the use of second array of ai's (2 1 3)?

0 votes ● Reply ● Message ● Permalink

**Mohamed Mostafa Mostafa EL Tair** a day ago

if the permutation is already sorted and i chose lens array to be empty array, will pos be considered 0 ??

0 votes ● Reply ● Message ● Permalink

**Kasa Sathish** a day ago

can i take same subsequence length again and again to reverse the order

0 votes ● Reply ● Message ● Permalink

**Ankit Kesharwani** 19 hours ago

YES !

0 votes ● Reply ● Message ● Permalink

**Yastika** 18 hours ago

please explain the sample input and output

0 votes ● Reply ● Message ● Permalink

**thepurpleowl** 13 hours ago

"The cards represent a permutation p of size n. " What does this mean??

0 votes ● Reply ● Message ● Permalink

**Jaime ARDP** 9 hours ago

i have to find the shortest path? what does that mean? or just make a single order?

0 votes ● Reply ● Message ● Permalink

**Zhe Hou** 3 minutes ago

for the sample input, why this is not one of the correct answers?

6
1 2
1 1
1 3
1 2
1 1
1 3

0 votes ● Reply ● Message ● Permalink