



西安电子科技大学
XIDIAN UNIVERSITY

The 2015 "Orz Panda" Cup Programming Contest



Sponsored by
ACM_XDU-ICPC QQ Group

Xidian University
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This problem should contain eleven (11) problems on eighteen (18) pages.
Please inform a runner immediately if something is missing from your problem set.

At first Orz all Grandmasters participating this contest!



About Programming Languages

OS	Compiler	Language	Command
Windows 7 (32-bit x86)	GCC 4.7.1 (MinGW)	C	<code>gcc -O2 -x c -Wl,--stack=8388608 -lm</code>
		C++	<code>g++ -O2 -x c++ -Wl,--stack=8388608 -lm</code>
		C++11	<code>g++ -O2 -x c++ -std=c++11 -Wl,--stack=8388608 -lm</code>

Problem A. Array of Orz Pandas

Description

There are several small Orz Pandas in an emotion. There are N Panda emotions in row. The numbers of small pandas in i -th Panda emotion is $A[i]$. Let

$$f(l,r) = \sum_{i=l}^r [(A[i] \geq K_1) \wedge (A[i] \leq K_2)]$$

$a \wedge b$ represents the logical and of a and b . $[Expression]$ means that if the logical expression $Expression$ is true, then $[Expression]$ is 1, otherwise 0. Now an Orz Panda wants you to calculate the result of $f(l,r)$.

Input

There are several test cases, please process to EOF.

The first line of the input contains two integers N and M denoting the number of Panda emotions and the number of queries. Next line contains N integers denoting $A[i]$.

Next M lines, each line contains four integers l, r, K_1, K_2 .

$1 \leq N \leq 100000, 1 \leq M \leq 100000, 0 \leq A[i] \leq 10^9, 1 \leq l \leq r \leq N, 0 \leq K_1 \leq K_2 \leq 10^9$.

Output

For each test case, output M lines, i -th of them is the result of the i -th query.

Samples

Sample Input	Sample Output
4 2 1 2 3 4 1 3 2 3 1 1 1 1	2 1

Problem B. Bidirectional Orz Pandas

Description

Several Orz Pandas are in a line. However, God Wan is coming from left, while God Big Bread is coming from right. They're both very diaoable so Orz Pandas must Orz both of them.

The captain of Orz Pandas, CupSpirit, has invented a special 0-1 string to solve this problem. Assume S_0 is an empty string, and

$$\forall i > 0 \ S_i = \text{switch}(S_{i-1}) + "1" + \text{reverse}(S_{i-1})$$

Here "+" means concatenation of strings. $\text{reverse}(x)$ means the result of reverting the string x , for example $\text{reverse}("100") = "001"$. And $\text{switch}(x)$ means every '0' becomes '1' and every '1' becomes '0', for example $\text{switch}("100") = "011"$.

Now Captain CupSpirit has selected string S_N to determine the direction of all Orz Pandas. If $S_N[i] == '0'$, the i -th Orz Panda should Orz God Wan. Otherwise the i -th Orz Panda should sr0 God Big Bread. For example, if $N = 3$, the Orz Pandas would be like



Please determine the direction of K -th Orz Panda.

Input

There are multiple test cases, please process to EOF. For each test case:

The first line contains two integers N and K .

For all test cases, $1 \leq N \leq 10^{18}$, $1 \leq K \leq \min(|S_N|, 10^{18})$.

Output

For each test case, output one line. If this Orz Panda is Orzing God Wan, output "Orz". Otherwise output "sr0".

Samples

Sample Input	Sample Output
3 1	sr0
3 2	Orz
3 3	Orz
3 4	sr0
3 5	sr0
3 6	sr0
3 7	Orz





Hints

$S_1="1"$, $S_2="011"$, and $S_3="1001110"$.

Problem C. Combining Orz Pandas

Description

Orz Pandas are very lovely and we send them in QQ to show our respect to someone very diaoable, for example God Wan. Master Nuo loves to create new Orz Panda emotion by combining some small Orz Panda emotions. For example, by combining four Orz pandas A, Master Nuo can get a new emotion X. And by combining one Orz Panda B and some Orz Panda A's, he can get a new emotion Y.

A	B	X	Y
			

Master Nuo has N small Orz Panda emotions, with period T_1, T_2, \dots, T_n . Now he wants to combine exactly K ones of them, in order to create one large Orz Panda emotion. To keep the GIF file small, he wants to minimize T , the period of the large Orz Panda emotion.

However, if the minimal T is larger than 1000, the emotion will be too large to be sent. So Master Nuo would simply type "Orz" in QQ, instead of sending an emotion.

Input

There are multiple test cases, please process to EOF. For each test case:

The first line contains two integers N and K . The second line contains N space separated integers T_1, T_2, \dots, T_n .

For all test cases, $1 \leq K \leq N \leq 50$, $1 \leq T_i \leq 1000$.

Output

For each test case, output one line. If minimal T is not larger than 1000, output it. Otherwise output "Orz".



Samples

Sample Input	Sample Output
5 4	10
10 10 10 10 100	10
17 14	1000
1 3 10 10 10 10 10 10 10 10 10	Orz
10 10 10 10 11 7	
3 2	
1000 1000 999	
3 2	
1000 999 998	

Hints

For the first sample, the answer is X.

For the second sample, the answer is Y.

For the third sample, Master Nuo have to choose the first and the second Orz Panda to make an emotion with period not greater than 1000.

For the fourth sample, the minimal T is 499000, larger than 1000.



Problem D. Dominator Orz Pandas

Description

Master Jie has a country with N cities and $N-1$ roads which form a tree and the capital city 1 is considered as the root of the tree. As the king of the country, Master Jie wants to dominate this country. Since he likes Orz Pandas very much, he decided to send N Orz Pandas to those cities and each city will have one and only one Orz Panda.

Now Master Jie has N Orz Pandas numbered 1 to N , and the i -th Orz Panda's ability value is exactly i . In his country, there are M cities considered "important", and the Orz Panda of an important city must be a "dominator".

We think an Orz Panda is a dominator if and only if he has the maximum ability value in his sub-cities. His sub-cities means the cities in the subtree rooted his city.

Now Master Jie wants to know how many different ways he has to send the Orz Pandas so that each important city has a dominator. But he is too busy to manage his country, can you help him?

Input

There are multiple test cases (no more than 20), please process to EOF.

In each test case, the first line contains two numbers N and M ($0 \leq M \leq N \leq 100000$).

Next $N-1$ lines, each line contains two numbers u and v ($1 \leq u, v \leq N$), indicates there is an undirected road between city u and city v .

Next M lines, each line has one number x ($1 \leq x \leq N$), indicating the city x is important. A same x may appear multiple times.

Output

For each test case, output one line, containing the number of different ways modulo $10^9 + 7$.

Samples

Sample Input	Sample Output
3 3 1 2 1 3 1 2 3 3 2 1 2 1 3 2 3	2 6

Problem E. Equation of Orz Pandas

Description

An Orz Panda find a very interesting problem. His problem is that $x + y = A$, $x * y = B$, where A and B are constant, how to calculate $x^2 + y^2$, $x^3 + y^3$, $x^n + y^n$. The panda wants you to help him to solve it. If you can solve it successfully, he'll summon many small pandas to Orz you.

In this problem, you just need calculate the result of $x^n + y^n$. Since the result can be very large, determine the remainder after dividing it by $10^9 + 7$.

Input

There several test cases (about 200 ones), please process to EOF. For each test case, the first line contains three integers A , B , n .

$$0 \leq A, B \leq 1000000, 1 \leq n \leq 10^9.$$

Output

For each test case, output one line, containing the answer modulo $10^9 + 7$.

Samples

Sample Input	Sample Output
3 2 2	5

Problem F. Fighting Orz Pandas

Description

Each Orz Panda has a property IQ, which is a positive integer. An srO Panda A_i will beat an Orz Panda fixed the follow conditions: Have the **smallest** IQ among all the pandas whose IQ is **not less** than A_i .

There are N Orz Pandas numbered from 1 to N ($N \leq 100000$) in the QQ group ACM_XDU-ICPC. Today M srO Pandas ($M \leq 100000$) rush into this group, please output the id of Orz Pandas who will beaten by each srO Panda. An Orz Panda can be beaten multiple times.

If there are multi answer output the one with minimum id. No answer output -1. (id is index of input of Orz Pandas. start from 1.)

Input

There several test cases, please process to EOF.

For each test case, the first line contains two integers N and M ($1 \leq N, M \leq 100000$). Next N lines, each contains one integer less than 2^{31} , indicating the IQ of an Orz Panda. Next M lines, each contains one integer less than 2^{31} , indicating the IQ of an srO Panda.

Output

For each case, output M space separated integers in a line, the i -th one is the id of the Orz Panda beaten by i -th srO Panda.

Samples

Sample Input	Sample Output
3 4 1 2 3 1 2 3 4	1 2 3 -1

Problem G. Gold of Orz Pandas

Description

One Orz Panda is addicted to an RPG game. To make his character stronger, he have to finish quests to get EXP for higher level. At first he accepted all the N quests. But after he read rules carefully, he realized that what he has done was stupid.

Rule:

Every quest costs 1 time interval.

Every quest has a dead line. If you can't finish it on time, you have to pay the same amount of gold as the EXP given by this quest.

Orz Panda wants to know the minimum amount of gold he has to pay.

Input

There several test cases, please process to EOF.

For each test case, the first line contains one integer N . The second line contains N space separated integers t_i , representing the i -th quest's dead line. The third line has N space separated integers e_i , representing the EXP given by the i -th task.

$1 \leq N, t_i, e_i \leq 1000$.

Output

For each test case output one integer, indicating the minimum amount of gold the Orz Panda has to pay.

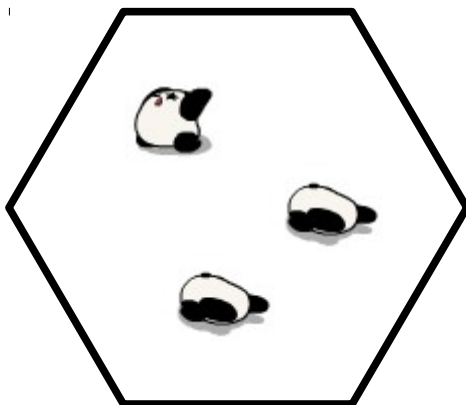
Samples

Sample Input	Sample Output
4 3 1 2 3 10 20 30 40	10

Problem H. Hexagon of Orz Pandas

Description

A hexagon of which all angles are 120° is called "*diaoable hexagon*". Now Orz Pandas have 6 segments and they want to create a room to live in with those segments. Orz Pandas wants the room to be *diaoable* and as large as possible.



In order to be Orzed you should help them to determine the maximum area of *diaoable hexagon* you can construct.

Input

There are multiple test cases (not more than 7000 ones).

For each test case, the first line contains 6 integers indicating the length of each segment. Process to end of file.

$1 \leq \textit{length} \leq 10000$.

Output

For each test case, output the the maximum area of *diaoable hexagon* you can construct in one line. (If no *diaoable hexagons* can be constructed, 0 should be printed.)

Note that you should round the answer to the nearest number with exactly two digits after the decimal point (0.005 rounds up to 0.01).

Samples

Sample Input	Sample Output
1 1 1 1 1 1 2 3 3 3 3 3	2.60 0

Problem I. Inserting Orz Pandas

Description

Orz Panda emotion is a famous emotion in XDU/ACM-ICPC QQ groups. Big Big Xi loves to create new Orz Panda emotions. Now he has a matrix with n lines and m columns, forming $n \times m$ cells. And he wants to insert some small Orz Pandas to this matrix to create a big emotion. In each cell of the matrix, he will determine whether put a small Orz Panda or not. For some reasons, he has some special needs of the emotions:

1. In the i -th ($1 \leq i \leq m$) column, there must be $a[i]$ small Orz Pandas.

2. In the i -th ($1 \leq i \leq n$) line, the total number of Orz Pandas modulo 2 must be $b[i]$.

For example, if $n=2$ and $m=3$, $a[1..3]=\{1,1,1\}$, $b[1..2]=\{1,0\}$, An adapted answer can be like this:



Now, Big Big Xi wants to know there are how many adapted ways to insert the Pandas.

Input

There are multiple test cases (no more than 100 ones, including no more than 10 test cases with large n and m), please process to EOF.

For each test case, the first line contains two integers N and M ($0 < N \leq 10$, $0 < M \leq 100$) at the first line.

The i -th of the next N lines contains only one number $a[i]$.

The i -th of the next M lines contains only one number $b[i]$ ($b[i] \in \{0, 1\}$).

Output

For each test case, output one number, the answer of the question modulo $10^9 + 7$.

Samples

Sample Input	Sample Output
1 1	1
1	4
1	
2 3	
1	
1	
1	
1	
0	

Problem J. Judgment of Orz Pandas

Description

As the time goes by, Orz Pandas' skill are improving. They found that if three Orz Pandas form a triangle, the person in the triangle will be orzed completely. So Orz Pandas want to know whether a person is in their formation.

If a person is on the border of the triangle, Orz Pandas would judge him/her as in the triangle.

Input

There are multiple test cases (about 20 ones). Please process to EOF.

For each test case, the first line contains eight real numbers $x_1, y_1, x_2, y_2, x_3, y_3, x, y$.

Orz Pandas are at points $(x_1, y_1), (x_2, y_2), (x_3, y_3)$ and the person is at point (x, y) . Every coordinate is bigger than -1001 and smaller than 1001.

Output

For each test case, output one line. If the person is in the triangle, output "Orz". Otherwise output "st0" (without quotes).

Samples

Sample Input	Sample Output
0 0 0.2 0 0.1 0.3 0.1 0.2	Orz
0 0 0.2 0 0.1 0.3 0.1 0.4	st0

Problem K. K=1 Problem of Orz Pandas

Description

One Panda named Orz was playing a interesting game. He got a big integer N and an integer K . In this game, he can exchange two single numbers in N . For example, he can get 1243 from 3241 by exchange 1 and 3. But Orz can exchange at most K times. So what's the biggest number after at most K times operations?

However, a VIP (Very Important Panda) of ACM/OPPC (Orz Panda Programming Contest) committee thought this problem was too hard for Orz Pandas. So he simplified this problem with constraint $K=1$. Your task is to solve the simplified problem.

Input

There are multiple test cases (not more than 20 ones). Please process to EOF.

For each test case, the first line contains an integer Num ($0 \leq Num \leq 10^{1000}$), and it's guaranteed that Num is an integer without any leading zeros.

Output

For each test case, output the biggest number after at most 1 times operation in a line.

Samples

Sample Input	Sample Output
12345	52341
23	32