A. Life Game

Rich people are playing life game,generally it is like they find some poor people. And they brainwash those people,make them believe that they have to kill all other to live. And they watch the procedure and bet on the results for fun. Of course they will kill the winner when the winner believe that he wins.
Today's game is different from before.There is a n*m matrix of people. Now you are the organizer and you can control those people's life.
If people at row i, column j, survive at the end, you will be rewarded with $w_{i,j}$ money.Otherwise you are rewarded with $b_{i,j}$ money.
Also,those rich people have some strange request, each one will point out a contiguous sub matrix of this matrix and say: if people in this sub matrix all die(or survive), you are
rewarded with s money.
You don't really care about those people's life, so you want to maximize the money you get.
What is the maximum money you can get if you kill those people optimally?
Please note that there's no restriction on killing people, you can kill no one, you can also kill everyone.
(Following text is irrelevant with the problem)
In the end, you kill everybody, and you find that you have been brainwashed too, and those people you killed are actually your friends and family. Then you get crazy and kill yourself, and those rich people enjoy a lot.
And the true organizer, I, get all the money supposed to be yours :).

Input

The first line contains an integer T(1<=T<=5).Denoting the number of the test cases.
For each test cases,the first line contains three integers n, m, r(n<=50, m<=50, r<=50000),denote the number of rows,the number of columns and the number requests.
Then follows a n * m integer matrix b.
Then follows a n * m integer matrix w.
$0<=b_{i,j}$, $w_{i,j}<=100$
Then r lines follows,each represent a request.
Each lines contains 6 integers r_1, c_1, r_2, c_2, t, s. It means the sub-matrix's top left corner is (r_1, c_1), and the bottom right corner is (r_2, c_2). t = 0 if they should survive, t = 1 if they should die. s is the reward you can get if this request are fulfilled. 0<=s<=10000.

Output

For each test cases,print the answer in one line.

Sample Input

```
2
2 2 3
34 44
63 30
1 9
53 57
1 2 2 2 1 2843
1 1 2 1 0 2169
2 1 2 1 1 6980
2 2 3
50 93
65 70
52 28
91 25
1 1 2 1 0 9862
2 1 2 1 1 1876
2 2 2 2 0 4190
```

Sample Output

```
9994
14313
```

B. Reincarnation

Now you are back,and have a task to do:
Given you a string s consist of lower-case English letters only,denote f(s) as the number of distinct sub-string of s.
And you have some query,each time you should calculate f(s[l...r]), s[l...r] means the sub-string of s start from l end at r.

Input

The first line contains integer T(1<=T<=5), denote the number of the test cases.
For each test cases,the first line contains a string s(1 <= length of s <= 2000).
Denote the length of s by n.
The second line contains an integer Q(1 <= Q <= 10000),denote the number of queries.
Then Q lines follows,each lines contains two integer l, r(1 <= l <= r <= n), denote a query.

Output

For each test cases,for each query,print the answer in one line.

Sample Input

```
2
bbaba
5
3 4
2 2
2 5
2 4
1 4
baaba
5
3 3
3 4
1 4
3 5
5 5
```

Sample Output

```
3
1
7
5
8
1
3
8
5
1
```

C. Crime

You kill a person and will be executed by shooting tomorrow,but you have a program contest to do today,after several hours' hard work,you solved all problems except this one.You died with the pity that didn't solved it.But now you have second chance.
Count the number of permutation of number 1 to n that every adjacent number are coprime.To avoid large number,output the result mod a number M.

Input

The first line contains integer T(1<=T<=5).Denoting the number of the test cases.
Then T lines follows,each line contains two integers n,M (1<=n<=28, 1<=M<=30000).
The n for each test cases will not be the same.

Output

For each test cases,print the answer in a line.

Sample Input

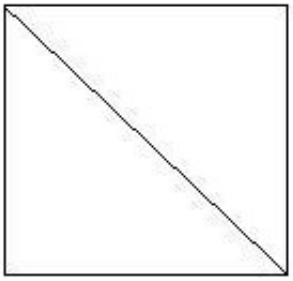
```
5
1 10000
2 10000
3 10000
4 10000
5 10000
```

Sample Output

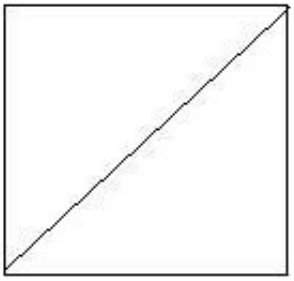
```
1
2
6
12
72
```

D. Endless Spin

I spin it again and again,and throw it away finally.
So now I have a row of n ball,named from 1 to n,each ball is white initially.
At each step I randomly chose a interval [l, r] and paint all ball in this interval to black.



1



2

It means every interval have a equal chance of being chosen.
And I'll stop if all ball are black.What is the expected steps before I stop?

Input

The first line contains integer T(1<=T<=50). Denoting the number of the test cases.
Then T lines follows, each line contains an integer n (1<=n<=50).

Output

For each test cases,print the answer in a line.
Print the answer rounded to 15 decimal places.

Sample Input

```
3
1
2
3
```

Sample Output

```
1. 000000000000000
2. 000000000000000
2. 900000000000000
```

E. JZPTREE

There is a tree,there is a life.Can you solve this problem about tree?
Here we have a tree which has n vertices.
We define dist(u, v) as the number of edges on the path from u to v.
And for each vertices u , define E_u = $\sum_{v=1}^{n} dist(u,v)^k$
Give you the tree and k.
Print E_i for every vertices(from 1 to n).(mod 10007 for convenience).

Input

The first line contains integer T(1 T 5),denote the number of the test cases.
For each test cases,the first line contains two integers n,k(1<=n<=50000, 1<=k<=500).
Then next n-1 lines,each lines contains two integer a,b(1<=a, b<=n),denote there is an edge between a, b.

Output

For each test cases,print n lines,the i-th line contains E_i.

Sample Input

```
1
5 3
1 2
2 3
3 4
4 5
```

Sample Output

```
100
37
18
37
100
```

F. Jinkeloid

After listening several songs of Jinkeloid,I come up with this problem :).
There is a string s only consist of first 20 lowercase English letters.
And we have several queries,each time I have k letters c_1, c_2, ..., c_k,and I wonder how many consecutive substring of string s that each c_i has occur even times in it.
Two substring with the same content but different position are considered different.

Input

The first line contains integer T(1<=T<=5),denote the number of the test cases.
For each test cases,the first line contains a string s(1<= length of s <= 10^5),the second line contains a number Q (Q<= 3 * 10^4),denote the number of queries.
Then Q lines follows,each lines start with a number k(1<= k<= 5),then contains k lowercase English letters c_1, c_2, ..., c_k(There won't be duplicated c_i).

Output

For each query,print the answer in one line.

Sample Input

```
1
cacca
5
3 c a b
2 c b
2 a b
3 c b a
2 a b
```

Sample Output

```
2
7
6
2
6
```

G. The Unsolvable Problem

There are many unsolvable problem in the world.It could be about one or about zero.But this time it is about bigger number.

Given an integer n(2 <= n <= 10^9).We should find a pair of **positive integer** a, b so that a + b = n and [a, b] is as large as possible. [a, b] denote the least common multiplier of a, b.

Input

The first line contains integer T(1<= T<= 10000),denote the number of the test cases.
For each test cases,the first line contains an integer n.

Output

For each test cases,**print the maximum [a,b]** in a line.

Sample Input

```
3
2
3
4
```

Sample Output

```
1
2
3
```

H. Pieces

You heart broke into pieces.My string broke into pieces.But you will recover one day,and my string will never go back.
Given a string s.We can erase a subsequence of it if this subsequence is palindrome in one step. **We should take as few steps as possible to erase the whole sequence.**How many steps do we need?
For example, we can erase abcba from axbyczbea and get xyze in one step.

Input

The first line contains integer T,denote the number of the test cases. Then T lines follows,each line contains the string s (1<= length of s <= 16).
T<=10.

Output

For each test cases,print the answer in a line.

Sample Input

```
2
aa
abb
```

Sample Output

```
1
2
```

I. Burning

The sky is BURNING,and you find there are n triangles on a plane.
For every point p,if there's exactly k triangles contains it,then define it's thickness as k.
For every i from 1 to n,calculate the area of all points whose thickness is i.

Input

The first line contains integer T(T <= 5),denote the number of the test cases.
For each test cases,the first line contains integer n(1 <= n <= 50),denote the number of the triangles.
Then n lines follows,each line contains six integers x_1, y_1, x_2, y_2, x_3, y_3, denote there's a triangle with vertices (x_1, y_1), (x_2, y_2), (x_3, y_3).
0 <= x_i, y_i <= 100 for every i.

Output

For each test cases,print n lines,the i-th is the total area for thickness i.
The answer will be considered correct if its absolute error doesn't exceed 10^{-4}.

Sample Input

```
1
5
29 84 74 64 53 66
41 49 60 2 23 38
47 21 3 58 89 29
70 81 7 16 59 14
64 62 63 2 30 67
```

Sample Output

```
1348.5621251916
706.2758371223
540.0414504206
9.9404623255
0.0000000000
```

J. No Pain No Game

Life is a game,and you lose it,so you suicide.
But you can not kill yourself before you solve this problem:
Given you a sequence of number a_1, a_2, ..., a_n.They are also a permutation of 1...n.
You need to answer some queries,each with the following format:
If we chose two number a,b (shouldn't be the same) from interval [l, r],what is the maximum gcd(a, b)? If there's no way to choose two distinct number(l=r) then the answer is zero.

Input

First line contains a number T(T <= 5),denote the number of test cases.
Then follow T test cases.
For each test cases,the first line contains a number n(1 <= n <= 50000).
The second line contains n number a_1, a_2, ..., a_n.
The third line contains a number Q(1 <= Q <= 50000) denoting the number of queries.
Then Q lines follows,each lines contains two integer l, r(1 <= l <= r <= n),denote a query.

Output

For each test cases,for each query print the answer in one line.

Sample Input

```
1
10
8 2 4 9 5 7 10 6 1 3
5
2 10
2 4
6 9
1 4
7 10
```

Sample Output

```
5
2
2
4
3
```

K. Sad Love Story

There's a really sad story.It could be about love or about money.But love will vanish and money will be corroded.These points will last forever.So this time it is about points on a plane.
We have a plane that has no points at the start.
And at the time i,we add point $p_i(x_i, y_i)$.There is n points in total.
Every time after we add a point,we should output the square of the distance between the closest pair on the plane if there's more than one point on the plane.
As there is still some love in the problem setter's heart.The data of this problem is randomly generated.
To generate a sequence $x_1, x_2, ..., x_n$,we let $x_0 = 0$,and give you 3 parameters:A,B,C. Then $x_i = (x_{i-1} * A + B) \bmod C$.
The parameters are chosen randomly.
To avoid large output,you simply need output the sum of all answer in one line.

Input

The first line contains integer T.denoting the number of the test cases.
Then each T line contains 7 integers:n A_x B_x C_x A_y B_y C_y.
A_x,B_x,C_x is the given parameters for $x_1, ..., x_n$.
A_y,B_y,C_y is the given parameters for $y_1, ..., y_n$.
$T <= 10$.
$n <= 5 * 10^5$.
$10^4 <= A,B,C <= 10^6$.

Output

For each test cases,print the answer in a line.

Sample Input

```
2
5 765934 377744 216263 391530 669701 475509
5 349753 887257 417257 158120 699712 268352
```

Sample Output

```
8237503125
49959926940
```