A. MZL's Circle Zhou

MZL's Circle Zhou is good at solving some counting problems. One day, he comes up with a counting problem:
You are given two strings a, b which consist of only lowercase English letters. You can subtract a substring x (maybe empty) from string a and a substring y (also maybe empty) from string b, and then connect them as $x + y$ with x at the front and y at the back. In this way, a series of new strings can be obtained.
The question is how many different new strings can be obtained in this way.
Two strings are different, if and only if they have different lengths or there exists an integer i such that the two strings have different characters at position i.

Input

The first line of the input is a single integer T $(T \leq 5)$, indicating the number of testcases.
For each test case, there are two lines, the first line is string a, and the second line is string b.
$1 <= |a|, |b| <= 90000$.

Output

For each test case, output one line, a single integer indicating the answer.

Sample Input

```
2
acbcc
cccabc
bbbabbababbababbaaaabbbbabbaaaabaabbabbabbbaaabaab
abbaabbabbaaaabbbaababbabbababababaaaaabbaabbaabbaab
```

Sample Output

```
135
557539
```

B. MZL's xor

MZL loves xor very much.Now he gets an array A.The length of A is n.He wants to know the xor of all (A_i+A_j)($1 \leq i, j \leq n$)
The xor of an array B is defined as B_1 xor B_2...xor B_n

Input

Multiple test cases, the first line contains an integer T(no more than 20), indicating the number of cases.
Each test case contains four integers:n,m,z,l
$A_1 = 0$,$A_i = (A_{i-1} * m + z) \ mod \ l$
$1 \leq m, z, l \leq 5 * 10^5$,$n = 5 * 10^5$

Output

For every test.print the answer.

Sample Input

```
2
3 5 5 7
6 8 8 9
```

Sample Output

```
14
16
```

C. MZL's combat

MZL is an active boy.One day,he is playing a game with DSY and GTW.

The combat happened in a chessboard which has R rows and C columns.every grid has a parent.the parent of gird (x, y) is $(x-1, y-1)$.the parent of grid $(1, y)$ is $(1, y-1)$ and the parent of grid $(x, 1)$ is $(x-1, 1)$,$(1, 1)$has no parent.

Let's define x is the ancestor of y while one of the following conditions meets:
1.$x = y$
2.x is the parent of an ancestor of y

Initially the nodes in the chessboard are either white or black.Every player takes turns to act.In each turn,the player can choose a white node and choose one of its ancestors,then the nodes which lies in the path from the chosen node to the chosen ancestor flip its color(white into black,black into white),the player who cannot act loses the game.GTW takes the first turn.

Suppose the two players act optimally,DSY wonders whether he will win the game.

In consideration of the large size of the chessboard.DSY gives a list of rectangles ,the initial white nodes is the union of the rectangles.

Input

the test data consists several cases.Please read until EOF.

the first line are 3 integers n, R, C,means the list size of the rectangles,the number of the rows and the number of the columns.

next n lines ,each line has 4 integers,x_1, y_1, x_2, y_2,means the upper left and the lower right nodes of the rectangle.
$Cases \leq 16, n, R \leq 10^5, C \leq 10^9, x_1, x_2 \leq R, y_1, y_2 \leq C$

And there are 8 big test cases and 8 small test cases

Output

if dsy has a strategy to win,print "DSY wins",otherwise,print "GTW wins"

Sample Input

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

Sample Output

```
GTW wins
DSY wins
```

D. MZL's game

MZL has n cute boys.They are playing a game♂.The game will run in turn
First,System choose an alive player x randomly.Player x will be out of the game.
Then player x will attack all alive players in the game
When a player is attacked,$1-p$ is the probability of he still lives,p is the probability of he dies
Now mzl wants to know：the probability of one player be out of the game and be attacked k times

You need to print the probability mod 258280327 for every k from 0 to n-1

According to Fermat Theory,$\frac{x}{y}$ mod 258280327=x*$(y^{258280325})$ mod 258280327

p will be given in a special way

Input

The first line of the input contains a single number T, the number of test cases.
Next T lines, each line contains three integer n,x,y.$p=\frac{x}{y}$
$T \leq 5$, $n \leq 2*10^3$ $0 \leq x \leq 10^9$ $x+1 \leq y \leq 10^9$.
It is guaranteed that y and 258280327 are coprime.

Output

T lines, every line n numbers: the ans from 0 to n-1

Sample Input

```
2
3 33 100
9 23 233
```

Sample Output

```
172186885 210128265 223268793
229582513 70878931 75916746 175250440 21435537 57513225 236405985 111165243 115953819
```

E. MZL's chemistry

MZL define $F(X)$ as the first ionization energy of the chemical element X

Now he get two chemical elements U, V,given as their atomic number,he wants to compare $F(U)$ and $F(V)$

It is guaranteed that atomic numbers belongs to the given set:$\{1, 2, 3, 4, ..18, 35, 36, 53, 54, 85, 86\}$

It is guaranteed the two atomic numbers is either in the same period or in the same group

It is guaranteed that $x \neq y$

Input

There are several test cases

For each test case,there are two numbers u, v,means the atomic numbers of the two element

Output

For each test case,if $F(u) > F(v)$,print "FIRST BIGGER",else print"SECOND BIGGER"

Sample Input

```
1 2
5 3
```

Sample Output

```
SECOND BIGGER
FIRST BIGGER
```

F. MZL's endless loop

As we all kown, MZL hates the endless loop deeply, and he commands you to solve this problem to end the loop.
You are given an undirected graph with n vertexs and m edges. Please direct all the edges so that for every vertex in the graph the inequation $|out\ degree\ -\ in\ degree| \leq 1$ is satisified.
The graph you are given maybe contains self loops or multiple edges.

Input

The first line of the input is a single integer T, indicating the number of testcases.
For each test case, the first line contains two integers n and m.
And the next m lines, each line contains two integers u_i and v_i, which describe an edge of the graph.
$T \leq 100$, $1 \leq n \leq 10^5$, $1 \leq m \leq 3 * 10^5$, $\sum n \leq 2 * 10^5$, $\sum m \leq 7 * 10^5$.

Output

For each test case, if there is no solution, print a single line with -1, otherwise output m lines,.
In ith line contains a integer 1 or 0, 1 for direct the ith edge to $u_i \rightarrow v_i$, 0 for $u_i \leftarrow v_i$.

Sample Input

```
2
3 3
1 2
2 3
3 1
7 6
1 2
1 3
1 4
1 5
1 6
1 7
```

Sample Output

```
1
1
1
0
1
0
1
0
1
```

G. MZL's simple problem

A simple problem
Problem Description
You have a multiple set,and now there are three kinds of operations:
1 x : add number x to set
2 : delete the minimum number (if the set is empty now,then ignore it)
3 : query the maximum number (if the set is empty now,the answer is 0)

Input

The first line contains a number N ($N \leq 10^6$),representing the number of operations.
Next N line ,each line contains one or two numbers,describe one operation.
The number in this set is not greater than 10^9.

Output

For each operation 3,output a line representing the answer.

Sample Input

```
6
1 2
1 3
3
1 3
1 4
3
```

Sample Output

```
3
4
```

H. MZL's munhaff function

MZL is a mysterious mathematician, and he proposed a mysterious function at his young age.
Stilwell is very confused about this function, and he need your help.
First of all, given n positive integers A_i and $A_i \geq A_{i+1}$.
Then, generate n positive integers B_i

$$B_i = \sum_{j=i}^{n} A_j$$

Define $f(i,j)$ for $i,j \in Z$

$$f(i,j) = \begin{cases} 0 & (i,j) = (1,1) \\ min(f(i-1,j+1), f(i, \lceil \frac{j}{2} \rceil) + B_i) & i,j \in [1,n],\ (i,j) \neq (1,1) \\ 10^{11037} & otherwise \end{cases}$$

Find $f(n,1)$.

Input

The first line of the input contains a single number T, the number of test cases.
For each test case, the first line contains a positive integer n, and the next line contains n positive integers A_i.
$T \leq 100$, $1 \leq n \leq 10^5$, $\sum n \leq 10^6$, $1 \leq A_i \leq 10^4$.

Output

For each test case, output $f(n,1)$ in a line.

Sample Input

```
3
3
1 1 1
5
28 26 25 24 1
10
996 901 413 331 259 241 226 209 139 49
```

Sample Output

```
5
233
11037
```

I. MZL's Border

As is known to all, MZL is an extraordinarily lovely girl. One day, MZL was playing with her favorite data structure, strings.

MZL is really like $Fibonacci\ Sequence$, so she defines $Fibonacci\ Strings$ in the similar way. The definition of $Fibonacci\ Strings$ is given below.

1) $fib_1 = b$

2) $fib_2 = a$

3) $fib_i = fib_{i-1}fib_{i-2},\ i > 2$

For instance, $fib_3 = ab,\ fib_4 = aba,\ fib_5 = abaab.$

Assume that a string s whose length is n is $s_1 s_2 s_3 \ldots s_n$. Then $s_i s_{i+1} s_{i+2} s_{i+3} \ldots s_j$ is called as a substring of s, which is written as $s[i : j]$.

Assume that $i < n$. If $s[1 : i] = s[n - i + 1 : n]$, then $s[1 : i]$ is called as a $Border$ of s. In $Borders$ of s, the longest $Border$ is called as s' $LBorder$. Moreover, $s[1 : i]$'s $LBorder$ is called as $LBorder_i$.

Now you are given 2 numbers n and m. MZL wonders what $LBorder_m$ of fib_n is. For the number can be very big, you should just output the number modulo $258280327(= 2 \times 3^{17} + 1)$.

Note that $1 \le T \le 100,\ 1 \le n \le 10^3,\ 1 \le m \le |fib_n|$.

Input

The first line of the input is a number T, which means the number of test cases.

Then for the following T lines, each has two positive integers n and m, whose meanings are described in the description.

Output

The output consists of T lines. Each has one number, meaning fib_n's $LBorder_m$ modulo $258280327(= 2 \times 3^{17} + 1)$.

Sample Input

```
2
4 3
5 5
```

Sample Output

```
1
2
```

J. MZL's City

MZL is an active girl who has her own country.

Her big country has N cities numbered from 1 to N.She has controled the country for so long and she only remebered that there was a big earthquake M years ago,which made all the roads between the cities destroyed and all the city became broken.She also remebered that exactly one of the following things happened every recent M years:

1.She rebuild some cities that are connected with X directly and indirectly.Notice that if a city was rebuilt that it will never be broken again.

2.There is a bidirectional road between city X and city Y built.

3.There is a earthquake happened and some roads were destroyed.

She forgot the exactly cities that were rebuilt,but she only knew that no more than K cities were rebuilt in one year.Now she only want to know the maximal number of cities that could be rebuilt.At the same time she want you to tell her the smallest lexicographically plan under the best answer.Notice that 8 2 1 is smaller than 10 0 1.

Input

The first contains one integer T(T<=50),indicating the number of tests.

For each test,the first line contains three integers N,M,K(N<=200,M<=500,K<=200),indicating the number of MZL's country ,the years happened a big earthquake and the limit of the rebuild.Next M lines,each line contains a operation,and the format is "1 x" , "2 x y",or a operation of type 3.

If it's type 3,first it is a interger p,indicating the number of the destoyed roads,next 2*p numbers,describing the p destoyed roads as (x,y).It's guaranteed in any time there is no more than 1 road between every two cities and the road destoyed must exist in that time.

Output

The First line Ans is the maximal number of the city rebuilt,the second line is a array of length of tot describing the plan you give(tot is the number of the operation of type 1).

Sample Input

```
1
5 6 2
2 1 2
2 1 3
1 1
1 2
3 1 1 2
1 2
```

Sample Output

```
3
0 2 1
```