### 问题 A: Mex Query

时间限制: 1 Sec  内存限制: 256 MB  
提交: 792  解决: 168  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=0&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1550)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1550&cid=1381)] [命题人:外部导入]

**题目描述**

Give ****n**** non‑negative integers, please find the least non‑negative integer that doesn’t occur in the ****n**** numbers.

**输入**

The first line is an integer ****T****, representing the number of test cases.    
For each test case:    
The first line of each test case is an integer ****n****.    
The second line of each test case are **n** non‑negative integers ****ai.****   
****(T ≤ 10,  n ≤ 2 × 105,  0 ≤ ai < 231)****

**输出**

for each test case, output a line with the answer

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

2

4

4 0 1 3

2

1 1

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**2**

**0**

### 问题 B: icebound的商店

时间限制: 1 Sec  内存限制: 64 MB  
提交: 171  解决: 85  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=1&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1551)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1551&cid=1381)] [命题人:外部导入]

**题目描述**

icebound在得到神殿的宝藏之后，开了一家神秘的商店。你来到了商店，发现慷慨的icebound搞了**T**次促销活动。在每 次促销活动中，icebound都会想出一个他喜欢的数字，如果你买的商品的总价刚好等于icebound喜欢的数字，那么你就 可以免费得到这些商品。  
icebound的商店里一共有**15**件商品，商品的价格和这家商店一样神秘，第一件商品的价格是**1**元，第二件商品的价格 是**2**元，设第**n**件商品的价格为****wn****元，则：****wn = wn−1+ wn−2(3 ≤ n ≤ 15)。****  
如果在某次活动中icebound喜欢的数字是**4**，那么共有 **4**种购买方案：  
1. 买4个 第一种商品    
2. 买4个 第一种商品 和1个 第二种商品    
3. 买2个 第二种商品    
4. 买1个 第一种商品 和1个 第三种商品    
请你算出共有多少种方案可以免费购物，方案数对**1000000009(109+9)**取模。

**输入**

第一行给出一个整数**T**，表示icebound搞了**T**次活动。  
接下来的**T**行每行给出一个正整数 **x**，表示在这次活动中icebound喜欢的数字。  
**(1 ≤ T ≤ 3000, 1 ≤ x ≤ 3000)**

**输出**

输出**T**行，每行输出一个正整数。  
第**i**行的正整数表示在第**i**次活动中免费购物的方案数，方案数对**1000000009(109+9)**取模。

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3

5

20

30

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**6**

**134**

**509**

### 问题 C: Nim Game

时间限制: 1 Sec  内存限制: 128 MB  
提交: 447  解决: 66  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=2&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1552)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1552&cid=1381)] [命题人:外部导入]

**题目描述**

Nim is a mathematical game of strategy in which two players take turns removing objects from distinct heaps. On each turn, a player must remove at least one object, and may remove any number of objects provided they all come from the same heap |Fṝõṃ Wìǩìqèḋìa«țȟè ḟṝèè èñćẏćḽõqèḋìa¦. ****The goal of the game is to avoid being the player who doesn’t have any object to remove. The player who remove the last project is the winner.****  
Now KK and TT are playing Nim game with the optimal strategy. There are ****n**** heaps of stones. The number of stones in **i**‑th heap is **ai**. They play this game ****m**** times, and KK is the player making the first move. During the **i**‑th time they play the game on the heaps whose index in interval****[li , ri]****. KK wants to know whether he has a winning strategy or not.

**输入**

The input consists of several test cases. The first line of the input gives the number of test cases,**T(1 ≤ T ≤ 103)**.  
For test case, the first line contains two integers **n(1 ≤ n ≤ 106 )** and **m(1 ≤ m ≤ 106)**, representing the number of heap of stones and the game times.  
The second line contains**n** positive integers **a1, a2, ⋯ , an (1 ≤ ai ≤ 109)**, representing The number of stones in **i**‑th heap.  
In the next **m** lines, each line contains two integers**li, ri** , which means the $i: KaTeX parse error: $ within math mode$th game is played on the interval**[li , ri]**.  
It’s guaranteed that**∑ n ≤ 2 × 106**and  **∑ m ≤ 2 × 106**．

**输出**

For each test case, let**fi** represents the answer of the **i**-th game.  
If KK has a winning strategy in the **i**-th game then **fi=1**, otherwise**fi=0**. Please output**∑ fi ∗ 2m-i mod 10 + 7，in which 1 ≤ i ≤ m**．

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

3

2 1

1 1

1 2

2 1

1 2

1 2

3 2

1 2 2

1 2

2 3

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**0**

**1**

**2**

### 问题 D: Defending Plan Support

时间限制: 1 Sec  内存限制: 64 MB  
提交: 89  解决: 19  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=3&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1553)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1553&cid=1381)] [命题人:外部导入]

**题目描述**

The architectural structure of the college is strange, but the rule is that there is only one simple path between every two classrooms. Now the battle between Class A and Class F broke out. As a support staff of Class F, you have to go to every fight in time to help out. With the help of icebound, Class F know the probability of each classroom being attacked. So we define an important degree for each classroom. Now ask you to find a classroom ****x**** in ****n**** classrooms as your resting base which has the minimum****F(x)****. ****F(x) = ∑ w(i) × d(x, i)****, **d** is the distance between****x**** and ****i****.

**输入**

he first line is an integer ****n****，which is the number of classrooms.  
Then ****n-1**** lines follow. Each line has three numbers****x,y,z****. There is a road ****z**** of meters between ****x**** and****y****.  
The last line contains ****n**** numbers. The****i****‑th number****w(i)****is the important degree of the classroom.  
2****≤ n ≤ 5 × 105, 0 ≤ z, wi ≤ 1000,1 ≤ x, y ≤ n****

**输出**

Output a line with an integer, representing the minimum ****F(x)****.

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

5

1 2 1

2 3 1

2 4 1

3 5 6

2 3 1 8 7

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**60**

### 问题 E: Bitmap

时间限制: 2 Sec  内存限制: 256 MB  
提交: 25  解决: 1  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=4&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1554)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1554&cid=1381)] [命题人:外部导入]

**题目描述**

RSYJ is a computer scientist. He has developed many useful image search tools. But now he has encountered some problems.  
We use a matrix ****H × H**** of to represent a bitmap with ****H × H****size, and each pixel of the ****8****‑bit bitmap is represented by the integer between**[0, 255]**.  
Now, RSYJ have a****8****‑bit bitmap ****A**** with ****m × m**** size, and a ****8****‑bit bitmap ****B**** with ****m × m**** size.RSYJ uses an image processing software to copy bitmap ****B**** to some positions in bitmap ****A****. Due to RSYJ’s computer’s error, the value of each pixel in the bitmap ****B**** is added with an offset****k****, which is an integer, but RSYJ doesn’t know what **k** is.  
Now your task is writing a program to help RSYJ find all positions of bitmap **B** in the bitmap ****A****. To simplify the problem, you only need output how many positions of bitmap ****B**** in bitmap****A****.  
For example, here are two bitmaps **A** and ****B****:  
A:  
10 9 3  
11 6 5  
15 7 2  
B:  
4 3  
5 0  
Bitmap **B** was added with an offset ****6****. It becomes:  
10 9   
11 6   
Bitmap **B** was added with an offset****2****. It becomes:  
6 5   
7 2   
So there are two positions of bitmap **B** in bitmap ****A****.

**输入**

The first line of the input gives two positive integers ****n****,**m** , representing the size of bitmap **A** and the size of bitmap ****B****, respectively.  
The next **n** lines give the bitmap **A**. Each line contains **n** integers.  
The next m lines give the bitmap **B**. Each line contains**m**  integers.   
**(1 ≤ n ≤ 2000 , 1 ≤ m ≤ 1000,  0 ≤ aij ≤ 255,  0 ≤ bij ≤ 255 )**

**输出**

Please output an integer, representing the number of positions of bitmap **B** in bitmap ****A****.

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

3 2

1 2 9

3 4 7

5 6 0

3 4

5 6

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**2**

### 问题 F: 神殿

时间限制: 1 Sec  内存限制: 128 MB  
提交: 727  解决: 126  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=5&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1555)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1555&cid=1381)] [命题人:外部导入]

**题目描述**

icebound通过勤工俭学，攒了一小笔钱，于是他决定出国旅游。这天，icebound走进了一个神秘的神殿。神殿由八位守护者守卫，总共由**64**个门组成，每一道门后都有一个迷宫，迷宫的大小均为**100 × 100**。icebound在迷宫中总共耗时**T**小时，消耗食物**K**公斤。历经千辛万苦之后，icebound终于穿越了迷宫，到达了神殿的中心。神殿的中心有一个宝箱。宝箱上显示有两个正整数**l**和**r**。icebound苦思冥想，终于发现一些打开宝箱的线索。你需要找到一个数**P**，它具有一个美妙的性质：它是**[l, r]**中所有数的二进制表示里，**1**的个数最多的一个数。如果你发现了这个美妙的数字，你就可以打开宝箱，获得巨额财富。  
比如[4, 8]中：  
4: 0100  
5: 0101  
6: 0110  
7: 0111  
8: 1000  
二进制表示中****1****的个数最多的数是**7**，它含有**3**个**1**。

**输入**

输入一行，两个正整数：**l**和**r**，用空格隔开，代表神殿中宝箱上显示的数。  
**1 ≤ T < 231,1 ≤ K ≤ 105,1 ≤ l ≤ r ≤ 2 × 109**

**输出**

一个十进制数**P**，代表满足条件的解。如果有多个**P**满足条件，输出最小的**P**。

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4 8

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**7**

### 问题 G: K Multiple Longest Commom Subsequence

时间限制: 1 Sec  内存限制: 256 MB  
提交: 13  解决: 3  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=6&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1556)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1556&cid=1381)] [命题人:外部导入]

**题目描述**

KK has two sequences,**A** and **B**, and wants to find the**k** multiple longest common subsequence.A sequence ****S****is a ****k**** multiple common subsequence of **A** and B if and only if it satisfies the following conditions:  
**S** is a subsequence of **A** and is a subsequence of **B**. (A subsequence is a sequence that can be derived from another sequence by deleting some or no elements without changing the order of the remaining elements.)  
The length of **S** is **t × k** where **t** is a nonnegative integer. The first element of **S** is **S[1]**. If we divide the sequence into **t** groups with the ****i****- th group containing **S[(i − 1) × k + j](1 ≤ j ≤ k)**, for every element **g**, it shares the same value with other elements that are in the same group which **g** belongs to.  
For example, **[1, 1, 2, 2]** is a double common subsequence of**[1, 2, 3, 1, 2, 3, 2]** and ****[1, 3, 1, 2, 2]****. KK wants to know the maximum length of such sequence.

**输入**

The first line is an integer **T**, denoting the number of test cases.  
For each test case, the first line are three integers **k, n, m**, denoting the kind of subsequence, the length of A and the length of**B**.  
The second line are****n**** integers **A1 ∼ An**, representing the elements of **A**.  
The third line are**m**  integers **B1 ∼ Bm**, representing the elements of ****B****.  
**1 ≤ T ≤ 10 , 1 ≤ k, n, m ≤ 103 , 1 ≤ Ai, Bi ≤ 103.**

**输出**

For each test case, output a line with the maximum length of **k** multiple common subsequence.

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

3

1 4 5

1 2 3 4

4 1 3 2 4

2 8 7

1 1 2 2 3 3 4 4

1 2 3 1 2 3 3

3 9 9

1 1 1 2 2 2 3 3 3

1 2 3 1 2 3 1 2 3

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**3**

**4**

**3**

### 问题 H: 跑图

时间限制: 1 Sec  内存限制: 64 MB  
提交: 550  解决: 94  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=7&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1557)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1557&cid=1381)] [命题人:外部导入]

**题目描述**

跑图是RPG游戏中很烦躁的事情。玩家需要跑到距离他最近的传送点的位置。现在给你一张**N × M**的方格图，每个方格中数值**0**表示为平地，数值**1**表示为传送点，你的任务是输出一张 **N × M** 的矩阵，**Matrixxy**表示从 **(x, y)** 到距离它最近的传送点的距离。 这里的距离是曼哈顿距离，**(x1, y1)→ (x2, y2)** 的距离为**∣x1 − x2∣ + ∣y1 − y2 ∣**。

**输入**

第一行，有两个数**n,m**。接下来**n**行，每行**m**个数。  
数据保证至少有一个传送点。  
**1 ≤ n ≤ 500 ,  1 ≤ m ≤ 500**

**输出**

**n**行，每行**m**个数，表示某个点到离它最近的传送点的距离。

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2 3

0 0 0

1 0 1

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**1 2 1**

**0 1 0**

### 问题 I: Power Seq

时间限制: 2 Sec  内存限制: 64 MB  
提交: 0  解决: 0  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=8&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1558)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1558&cid=1381)] [命题人:外部导入]

**题目描述**

ch给你一个长度为 **n**的数列，有两种操作：  
set l r x ：将**[l, r]**内的数全都赋值为 **x**。  
query l r ：查询**[l, r]**中占主导地位的数字是哪个。  
该数字占主导地位，意思是该数在该区间中出现的次数占了区间长度的一半以上（出现一半不算占主导地位）。若没有，则输出**-1**。

**输入**

单组数据。  
第一行，一个数：**n** ，表示序列长度**(1 ≤ n ≤ 200000)**。  
第二行， **n**个数，分别为 **a1 ∼ an(0 ≤ ai ≤ 10 )**。  
第三行，一个数 **Q**，表示操作的个数 **(1 ≤ Q ≤ 200000)**。  
接下来的**Q**行，每行一个操作，如题目描述所示，数据保证输入合法。

**输出**

对于每个query操作，输出区间的主导数字是哪个。若不存在，输出 **-1** 。

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

10

1 2 1 2 1 2 1 2 1 2

10

query 1 10

query 2 10

query 1 9

set 1 5 3

query 2 3

query 1 10

query 1 9

set 1 10 1

query 2 3

query 1 10

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**-1**

**2**

**1**

**3**

**-1**

**3**

**1**

**1**

### 问题 J: Beautiful Array

时间限制: 1 Sec  内存限制: 256 MB  
提交: 13  解决: 2  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=9&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1559)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1559&cid=1381)] [命题人:外部导入]

**题目描述**

Senior Pan has two positive integers **x** and ****y****, and she calls an array is a beautiful array if and only if it satisfies the following conditions:   
The elements in the array are integers.   
The length of the array is exactly **y**.   
The product of each element is exactly **x**.   
Senior Pan wants you to help her calculate the number of beautiful arrays for different **x** and**y**.Two arrays**A** and**B** are considered different if there exists a position **i**that **Ai ≠ Bi**.  
The answer can be very large, so you can just tell her the number mod **109+7**.   
For example, if**x** is **2** and **y** is **2**, there are four beautiful arrays: **[1, 2], [2, 1] ,[−1, −2], [−2, −1]**.

**输入**

The first line is an integer **T**, denoting the number of test cases.  
For the following **T** lines, each line contains two positive integers **x** and **y**.  
**1 ≤ T ≤ 105,  x, y ≤ 2 ∗ 106**

**输出**

Output **T** lines, each line contains an integer, representing the number of beautiful array mod **109+7**.

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

2

2 2

4 2

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**4**

**6**

### 问题 K: 520

时间限制: 1 Sec  内存限制: 512 MB  
提交: 498  解决: 175  
[[提交](http://acm.zzuli.edu.cn/submitpage.php?cid=1381&pid=10&langmask=0)] [[状态](http://acm.zzuli.edu.cn/problemstatus.php?id=1560)] [[讨论版](http://acm.zzuli.edu.cn/bbs.php?pid=1560&cid=1381)] [命题人:外部导入]

**题目描述**

“又到了五月了呢”，icebound望着五月的天空，眼角流出了泪痕。那一年，icebound还是一个懵懂的少年。那 一年，她还是一个青涩纯真的少女。在那一次偶然的相遇之中，他们之间擦出了爱情的火花。他们欢笑着，奔 跑着，他们展望着美好的未来，向往着幸福的明天。她像 icebound 心海中的灯塔，像icebound 头顶上的星 辰，即使在海里浮沉，即使在夜里摸爬，心中也不会感到迷茫，感到阴寒。他们努力，奋进，向着六月的那一 站前行。可是，美好总是短暂的。那海上的灯塔不再发出温情的光亮，那天空中的星辰不再绽放出温柔的色 彩。那一站，到达了，icebound 得到了终点，但icebound 永远失去了她，也失去了他的心。   
侯门一入深似海，从此萧郎是路人;   
 今天是2018年5月20日，又是一年的520。这一天，icebound不小心读到上面的诗，icebound沉思着，回想起 与她曾经的快乐时光，icebound留下了**n**滴眼泪。icebound的每滴眼泪都带有太多的伤感之情了，以至于每滴 眼泪都会感染到其他的生物，使得许多生物都一起掉下了眼泪。kk通过观察得知，当icebound流出 **n** 滴眼泪 时，所有生物产生的眼泪总数为**2n**。现在，kk需要你帮助他写一个程序，计算当icebound流出**n**滴眼泪时，所 有生物产生的眼泪总数**P**，对**20180520**取模。

**输入**

一个正整数**n** , 代表icebound留下眼泪的个数。**1 ≤ n ≤ 2 × 109**

**输出**

一个正整数**P**，代表所有生物产生的眼泪总数，对 **20180520** 取模。

**样例输入 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleinput').text()))**

1

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**2**

### 问题 L: icebound的账单

时间限制: 1 Sec  内存限制: 512 MB  
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**题目描述**

icebound从小就有记账的习惯。又到了月末icebound统计资金状况的时候。icebound每个月除了不停的挥霍以外，有时他会良心发现，勤工俭学，因此会有一些微薄的收入。然而icebound数学不好，需要你来帮助他统计他本月的资金状况。  
你将会得到一份icebound的账单，一共有 **n** 行整数，其中正数表示icebound打工挣来的收入，负数表示icebound消费的支出。数据保证不会出现 **0** 。  
如果icebound本月总收入大于总支出，请你输出“****icebound is happy.****”；如果本月总收入等于总支出，请你输出“****icebound is ok.****"；如果总收入小于总支出，请你输出"****icebound is sad.****"。

**输入**

第一行，有一个正整数**n**，代表账单有**n**行。  
接下来有**n**行，每行一个整数，第**i + 1**行整数ai。  
**1 ≤ n ≤ 1000 ，∣ai∣ ≤ 1000 , ai ≠ 0**

**输出**

输出一行。如果icebound本月总收入大于总支出，请你输出“****icebound is happy.****”；如果本月总收入等于总支  
出，请你输出“****icebound is ok.****"；如果总收入小于总支出，请你输出"****icebound is sad.****"。

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2

100

-100

**样例输出 [Copy](http://acm.zzuli.edu.cn/javascript:CopyToClipboard($('" \l "sampleoutput').text()))**

**icebound is ok.**