HUNNU Monthly Contest

December 2010 .

请注意一下几点:

0. 为了提高你的排名，请你先挑选比较简单的题目思考。一般 AC 人数多的题就更容易 ，当然也有例外。

1. 注意你程序中的数据范围：int 的数据范围为 [-2^31 , 2^31-1] ，__int64 的数据范围为[-2^63 , 2^63-1] 。
__int64 的输入格式为 scanf("%I64d" ,&x) , 输出格式为 printf("%I64d",x) ;

2. 当你得到一个 Wrong Answer 时 ，你可以检查： 数据是否溢出了 ； 输出格式是否与题目要求严格一致 ； 程序是否有逻辑错误 ； 等等。

3. 当你得到一个 Time Limit Exceed 时，说明你的算法效率太低，或者程序中存在死循环。一般 1000 ms 的时间内，可以运算 10^6 至 10^7 次运算 ，做题时请注意。

4. 当题目没有说明测试文件中测试数据的组数时，或者没有给出特定结束标志结束测试文件时，应当采用 while(scanf(...) != EOF) 循环输入 。

Problem_A: Codecraft III

Time Limit :2000 ms
Memory limit : 32768 kB

Problem Description :

Today Vasya visited a widely known site and learned that the continuation of his favourite game Codecraft II will appear after exactly k months. He looked at the calendar and learned that at the moment is the month number s. Vasya immediately got interested in what month Codecraft III will appear. Help him understand that.

All the twelve months in Vasya's calendar are named using their usual English names: `January`, `February`, `March`, `April`, `May`, `June`, `July`, `August`, `September`, `October`, `November`, `December`.

Input

There are several test cases in the input file. Each test case contains the name of the current month. It is guaranteed that it is a proper English name of one of twelve months. The first letter is uppercase, the rest are lowercase. The second line contains integer k ($0 \le k \le 100$) — the number of months left till the appearance of Codecraft III.

Output

Print starting from an uppercase letter the name of the month in which the continuation of Codeforces II will appear. The printed name must be contained in the list `January`, `February`, `March`, `April`, `May`, `June`, `July`, `August`, `September`, `October`, `November`, `December`.

Sample Input

November
3
May
24

Sample Output

February
May

Problem_B:Binary Number

Time Limit : 2000 ms
Memory Limit : 31786 KB

Problem Description

For 2 non-negative integers *x* and *y*, f(*x*, *y*) is defined as the number of different bits in the binary format of *x* and *y*. For example, f(2, 3)=1, f(0, 3)=2, f(5, 10)=4.
Now given 2 sets of non-negative integers **A** and **B**, for each integer *b* in **B**, you should find an integer *a* in **A** such that f(*a*, *b*) is minimized. If there are more than one such integers in set *A*, choose the smallest one.

Input

The first line of the input is an integer T ($0 < T \leq 100$), indicating the number of test cases. The first line of each test case contains 2 positive integers m and n ($0 < m, n \leq 100$), indicating the numbers of integers of the 2 sets **A** and **B**, respectively. Then follow ($m + n$) lines, each of which contains a non-negative integers no larger than 1000000. The first m lines are the integers in set **A** and the other n lines are the integers in set **B**.

Output

For each test case you should output n lines, each of which contains the result for each query in a single line.

Sample Input

```
2
2 5
1
2
1
2
3
4
5
5 2
1000000
9999
1423
3421
0
13245
```

353

Sample Output

1
2
1
1
1
9999
0

Problem_C : A Simple Problem

Time Limit : 1000 ms
Memory Limit : 65536KB

Problem description

Though little FeiBo is now in grade three , He is prepareing for National Collegiate Mathematical Contest .

Today he killed a very interesting problem in a second : Assuming that function f(x) = [x] represents the maximum integer which is not more than x . For instance , f(3.14) = 3 , f(-0.2) = -1 . Here is the task of the problem :

$$S(n) = \sum_{i=1}^{n} \left[\sqrt{i}\right]$$

We will give you a integer n , please tell me the S(n) .

Input

The first line contains a integer T , represent the number of test case . $1 \le T \le 1000$.
Each line of the following T line contains a integer n , we can guarantee that $1 \le n \le 1000000000$.

Output

Output S(n) per line for each test case .

Sample Output

2
1
10

Sample Output

1
19

Problem_D: Tom and Jerry

Time Limit: 1000 ms
Memory Limit : 32768 KB

Problem Description

Tom and Jerry have chased each other to the top of a poll about which cartoon stars adults most enjoyed.When we are watching the cartoon,we always find that Tom attempted to grabbed Jerry but failed. In the course of the catching,Cute Jerry invariablely tricked Tom and this always made us amused,Today Tom refined himself and try to catch Jerry again!!

Now you can see Tom and Jerry in the cage, the cage consist of n*m (n ≤100 && m ≤100) grids,Here is a sample cage

T.*.

..

...J

Each room is represented as follows:

* Obstacle : both Tom and Jerry cannot reach it .
T Tom : The initial position of Tom .
J Jerry : The initial position of Jerry
. Empty grid : Both Tom and Jerry can reach it but cannot stay for more than one second.

Now you know Tom's and Jerry's position,then tell you the movement of Jerry.Jerry and Tom can go through one grid per second. could you tell me whether Tom can catch Jerry **in K second** or not?

Input:

The first line contain a integer T : represented the number of test case.

For each test case :The first line contain 3 integers N , M , K : N and M is represented the rows and columns of the cage,K is represented that the number of steps that Jerry will move, the following N lines contain M characters,represented the grids, the following line contain K integers(consist of 0,1,2,3),which are represented the sequence of the oritation of movement of Jerry. 0 is repsented South,1, is represented East,2 is represented North, 3 is represeted West.

Output:

If Tom can catch Jerry,print “Yes”,or print “No”. Each test case contains one line .

Sample Input:

1

3 4 3
T.*.
..
...J
3 3 3

Samle Input

No

Problem_E：寂寞的世界

Time Limit ： 2000 ms

Memory Limit ： 32768 KB

Problem Description ：

凤凰传奇　问：“寂寞啊，寂寞！是谁的错。。。”

贺一航　　答：“一个人的寂寞两个人的错。。。”

阿桑　　哀怨：“你听寂寞在唱歌，轻轻的，狠狠的，歌声是那么残忍，让人忍不住泪流成河。。。”

寂寞无处不在。有时胡言乱语 ，也成了寂言寞语。

ACM 的世界也是一个寂寞的世界。

小朋友肥波最近又寂寞了。他一旦寂寞就玩数列，今天他拿出一个长度为 N 的数列：S[1] , S[2] , S[3] ... S[N] 。决定找出所有的三元组<i,j,k>打发时间，这些三元组满足条件：

<1>.　1　<=　i　<　j　<　k　<=　N　；

<2>. S[i] < S[j] < S[k] ；

他花了三年时间，总算是把所有的满足条件的三元组找出来了。他此时正在洋洋得意，想考考你。请问你，满足上述条件的三元组一共有多少个？

Input：

输入数据的第一行有一个整数 T (1<=T<=20) 。

接下来有 T 行，每行就是一组测试数据，该行第一个为 N，接下来 N 个数就是这个数列。

小肥波早就和你约定了数据范围： 1 ≤ N ≤100000 ， 0 ≤S[i]≤ 200000 。

Output：

每组测试请输出一行，这行包括一个整数，就是三元组总数。

Sample Input：

1
3 1 2 3

Sample Output：

1

Problem_F：超酷机器人

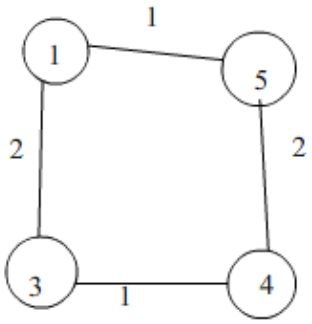
Time Limit : 2000 ms
Memory Limit : 65536 KB

Problem Description :

Mr Cool 是一位机器人领域大名鼎鼎的博士。他根据他最新的研究，研发了新一代应用化机器人。Mr Cool 为他的这个机器人取名叫做 Supper_Cool 。 Supper_Cool 是现代机器人的一个全新突破，他可以干很多的事情，比如智能学习，带有感情的和人交流，等等。对于洗碗，擦地，冲厕所这一类事情，Supper_Cool 可提不起兴趣。但是 Supper_Cool 很希望自己能够运动，于是，他请求 Mr Cool 帮忙。

Mr Cool 相当了解自己发明的这个带有人类情感的机器人，而且，他也看过《机械公敌》中这类机器人攻击人类的场面。他开始害怕某一天 Supper_Cool 会失去理智，对人类不利。于是他决定设计出一个能够限制 Supper_Cool 移动次数的程序，并植入 Supper_Cool 大脑。他认为这样既可以让 Supper_Cool 能够移动，又能够限制 Supper_Cool 的移动。

这下可害惨了 Supper_Cool 这个天真善良的机器人。比如，在下面这个地图中，Supper_Cool 要从 1 运动到 5 ， 本来直接用一步就可到达(1->5)。但是由于 Mr Cool 设定了 Supper_Cool 的移动次数必须在[2,4]这个区间内，这使得 Supper_Cool 不得不这样从 1 运动到 5 ： 1 -> 5 -> 1 ->5 。一起运动 3 次,3 在[2,4]这个区间，当然 Mr Cool 规定运动的次数必须是整数。



现在 Supper_Cool 有急事要从 S 处立刻赶到 T 处。但由于 Mr Cool 设定了他必须运动 a 至 b 之间的某个整数次，这让 Supper_Cool 感到相当的郁闷。于是他决定向顶尖计算机专家---你寻求帮助。假设 Super_Cool 给的地图是一张无向图，每条边带有一个权值表示该边连得两个点的距离，Supper_Cool 希望用最少的时间从 S 赶到 T。请你帮忙计算这个距离。

Input :

第一行一个正整数 T，表示测试数据的组数。
对每组测试数据：
第 1 行两个正整数：N 和 M ，表示地图的点数和边数。

第 2 行两个正整数：a 和 b ，表示 Supper_Cool 的运动次数必须是[a,b]内的一个整数。

接下来 M 行，每行三个正整数：x , y , w 表示从 x 到 y 有一条路径，长度为 w 。

假定 Supper_Cool 要从 1 处赶到 N。

Output :

对每组测试数据输出一行，该行有一个正整数，表示最短距离。假设地图中不存在满足条件的路径，请输出-1。

Sample Input :

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

Sample Output :

```
3
```

Hit :

<1>.数据规模说明；

1 <= N <= 100 ;
1 <= M <= 10000 ;
1 <= a <= b <= 1000000 ;
1 <= x , y <= N , 1 <= w <= 100 ;

<2>.数据给出的地图，有可能出现以下情况：

1. A->A 连有一条或多条条边 ；
2. A->B 之间有多条边。

Problem_G : Equal Squares

Time Limit : 5000 ms

Memory Limit : 65536 KB

Problem description

During a discussion of problems at the HNNU Training Camp, Super_Man and X_Man argued about who of them could in 300 minutes find a pair of equal squares of the maximal size in a matrix of size $N \times M$ containing lowercase English letters. Squares could overlap each other but could not coincide. He who had found a pair of greater size won. FeiBo walked by, looked at the matrix, said that the optimal pair of squares had sides K, and walked on. Super_Man and X_Man still cannot find this pair. Can you help them?

Input

The first line contain a integer T ,which means the number of test cases . $1 \leq T \leq 10$.
For each test case :The first line contains integers N and M separated with a space. $1 \leq N, M \leq 500$.
In the next N lines there is a matrix consisting of lowercase English letters, M symbols per line.

Output

Output a line for each test case , which is the integer K . If there are no two equal squares , you just need to output a integer 0 .

Sample Input

```
2

5 10
ljkfghdfas
isdfjksiye
pgljkijlgp
eyisdafdsi
lnpglkfkjl
2 2
ab
cd
```

Sample Output

```
3
0
```

Problem_H：一统诸侯

Time Limit: 1000 ms
Memory Limit: 65536 KB

Problem Description :

BitLand 星球正处于四分五裂的诸侯割据状态。近年来，诸侯各国连年征战，弄得百姓民不聊生。

当前实力最为强悍的 QIN 国早有一统全球的宏伟志向。恰逢现在的 ZHAO 国国君昏庸无道，穷奢极侈，致使 ZHAO 国现在一片混乱。 于是, QIN 国国主下定决心吞并 ZHAO 国，为一统全球奠定基础。

QIN 国将军 BaiQi 负责制定进攻计划 。BaiQi 将军通过仔细研究发现：一方面，ZHAO 国军事网络异常发达，他们沿着每一条网络路线布下重兵，一旦某个军事据点遭受攻击，整个 ZHAO 国牵一发而动全身，各路重兵都会来增援 ； 但是另一方面，一旦某一条路线连的两个军事据点受到攻击，那么该路线上的军事力量将处于孤立无援状态。

其实 QIN 国情报人员早已收集了所有 ZHAO 国的军事网络资料。但由于攻击不同的军事据点所耗费的资源（包括牺牲的将士，武器装备）数量不同，BaiQi 将军决定以最少的耗费，用来孤立最多的敌军力量。我们可以把军事网络看做是一张无向图， 每个军事据点看成是一个顶点，每条边代表一条连接两个军事据点的军事网络。顶点附有一个权值，表示攻击该军事据点的耗费；边也附有一个权值，表示该军事路线上的敌军人数。假设被孤立的 ZHAO 军人数总数为 P , 而 QIN 国攻击军事据点的所有耗费为 C , BaiQi 将军的计划是要求 P/C 达到最大。

现在，BaiQi 将军交代这个任务给你，要求你计算这个值。由于此次发兵机会难得，为免贻误战机，请你立马动工编写程序。

Input

第一行有一个正整数 T，表示测试数据的组数。

对每组测试数据：第一行有两个整数 n 和 m ,分别代表顶点数和边数。第二行有 n 个整数，第 i 个整数 cost_i 表示攻击顶点 i 耗费的资源数。接下来的 m 行，每行有 3 个整数, a , b , count , 表示连接军事据点 a 和 b 的这条路线的敌军人数为 count . 已知 ZHAO 国军事网络是一个简单图，即没有自环和重边。

Output:

对每组测试数据，输出 P/C ，这个实数应占一行。请保留 3 为小数。

Sample Input:

```
1
3 3
1 1 100
```

1 2 100
2 3 5
1 3 2

Sample Output

50.000

Hit

1<= n <= 100 ;
1<= m <= 2000 ;
1<= cost_i <= 100 ;
1<= a , b <= n ;
1<= count <= 100 ;

Problem_I :NARUTOACM's Problem

Time Limit: 1000ms

Memory Limit : 32678 KB

Problem Description

There are many hierarches in HUNNU. Such as Li,Hu,Cheng,Duan and so on.Li hierarch is good at maths.NARUTOACM is foolish in maths.One day,he has a very simple problem.But he can't solve it because his addle head.So he want to ask Li hierarch.Bad thing,Li hierarch have gone to Mars now.So,NARUTOACM needs your help.Can you help NARUTOACM to solve the problem?

You are given two positive integers,X and Y, whose decimal representations contain the same number of digits. A digit-swap operation for an index i swaps the digits at the i-th positions in X and Y. After **exactly** S digit-swap operations,what is the maximal possible value of X*Y ? Return the string representation of this maximal product with no leading zeroes.

Input

There are sevral test cases.One line for each test case containing 3 positive integers X,Y,S.X and Y will each contain between 1 and 50 characters(only '0' to '9'),inclusive,and will not start with a '0'. X and Y will contain the same number of characters.S will be between 0 and 1,000,000,000,inclusive. Be careful that X and Y are very big integers .

Output

There should be one output line per test case containing the maximal possible value of X*Y with no leading zeros after exactly S digit-swap operations.

Sample Input

```
123 321 2
4531 1332 0
9 1 1000000000
```

Sample Output

```
39483
6035292
9
```