A.CEO Shakil Vaia

Time : 1sec

Problem Statement:

Great brother Shakil Ahmed is CEO of Microogle, a famous tech company that has its HQ in Ocean View CA. Some hopeful juniors have applied for a job there and contacted brother Shakil. He promised them all that they will get a job. But unfortunately he can't take them all. So here's the deal. He has some favorite numbers in a favorite list. Each junior will be asked to shout some numbers in the interview room. If more than or equal to 50% of those numbers match some numbers from brother Shakil's list, they will be chosen for job. Otherwise they'll only have to be satisfied with the treat brother Shakil will give them in Microogle's cafeteria, and I heard they are pretty great. Now, given the favorite list and shouted numbers of the juniors, you have to write a program that tells whether one gets a job or a treat.

Input:

Test case (T): 1 <= T <= 100

For each case,

Number Favorite numbers (N): 1 <= N <= 100

Then there'll be N (**Distinct**) integers in the next line. Each integer (**f**, 1 <= f <= 1000) is numbers from favorite list.

Number Juniors Applied (A): 1 <= N <= 100

Then there'll be A lines. Each starting with an integer (**M, 1 <= M <= 100**). Then M (**Distinct**) integers will follow. Each integer (**a**, 1 <= a <= 100000) is the number shouted by that junior.

Output:

For each case there will be **A** lines each saying either "Job" or "Treat" depending on whether that junior gets job or not.

Sample Input	Sample Output
1	Job
10	
1 2 3 4 5 6 7 8 9 10	
1	
5 1 3 5 7 9	

B. Friendship Restaurant

Time Limit – 1 seconds

Samiul and Ansary are best friends . They start catering business together after their graduation . They named their restaurant as Friendship Restaurant an ironic symbol of trust , respect and love between friends . But as a start up they have limited amount of money . Even they need to borrow tables everyday from Abir's store house . Ansary has an imaginary fairy girlfriend who comes every night and tells him the arrival and leaving time of tomorrow's customers . Customers don't like to share a table with others. If there is no empty table when they arrive , they immediately leave the restaurant and may not come here again . So Samiul and Ansary must ensure a minimum number of tables are present in the restaurant so that at least one table is available for him/her on his/her arrival time .The same table can be used for non overlapping customers . Can you help them to ensure the minimum number of tables for tomorrow's customer.

Input :

Input starts with an integer **T (T <= 30)** denoting the number of test cases .
Each case starts with a line containing an integer **n (n <= 40)** denoting number of customers . Each of
the next n lines containing two integers **Ai and Li (1 <= Ai < Li <= 1000)** denoting arrival time and
leaving time of every customer .

Output:
For each case, print the case number and the minimum number of table needs for tomorrow .

Sample Input	Sample Output
2 2 1 3 3 5 4 1 10 10 20 11 21 3 5	Case 1: 2 Case 2: 2

C. Fully Connected Network

Time Limit: - 1 sec

A mesh network is a network topology in which each node relays data for the network. All mesh nodes cooperate in the distribution of data in the network.
Mesh networks can relay messages using either a flooding technique or a routing technique. With routing, the message is propagated along a path by hopping from node to node until it reaches its destination. To ensure all its paths' availability, the network must allow for continuous connections and must reconfigure itself around broken paths, using self-healing algorithms such as Shortest Path Bridging. Self-healing allows a routing-based network to operate when a node breaks down or when a connection becomes unreliable. As a result, the network is typically quite reliable, as there is often more than one path between a source and a destination in the network. Although mostly used in wireless situations, this concept can also apply to wired networks and to software interaction.
A mesh network whose nodes are all connected to each-other is a fully connected network. Fully connected wired networks have the advantages of security and reliability: problems in a cable affect only the two nodes attached to it. However, in such networks, the number of cables, and therefore the cost, goes up rapidly as the number of nodes increases.
Now give you N computers. You have to tell how many connections required creating a fully connected network?

Input

At first gives you an integer T (T<=1000), is the number of test cases. Each case gives you an integer X (1<=X<=1000).
Output

For every test case, print minimum connections required to make a fully connected network.

Sample Input

2
3
5
Sample Output

3
10
Look, for 3 computers how we can create a fully connected network.

D. GCD Query

Time Limit: - 1 sec

In mathematics, the greatest common divisor (gcd) of two or more integers, when at least one of them is not zero, is the largest positive integer that divides the numbers without a remainder. For example, the gcd of 8, 12, 16 is 4.
That means gcd(8,12,16) = 4 . It can be written as gcd(8,12,16) = gcd(gcd(8,12),16) = gcd(4,16) = 4 .
The problem is based on gcd. Give you n numbers (A_1, A2, A3,…., An) and q query . Each query gives you two integers L, R. You have to print gcd(A_L,A_{L+1},A_{L+3},…,A_R).
Input

At first gives you an integer T (T<=10), is the number of test cases. For each test case -
The first line contains the integer n (n<=10000).
In the second line, n numbers follow (numbers will be less than or equal 10^9).
The third line contains the integer q (q<=1000).
q lines follow, where line i contains 2 numbers L and R (1<=L,R<=n).
Output

For every test case, print case number and require result.

Sample Input

2
3
1 2 3
3
1 3
2 3
1 2
5
4 8 12 16 20
1
1 5
Sample Output

Case 1:
1
1
1
Case 2:
4
Look, for test case 2 there are 5 numbers 4, 8, 12, 16, 20. And only one query gives L = 1, R = 5. Now A_1 = 1*4, A_2 = 2*4, A_3 = 3*4, A_4 = 4*4, A_5 = 5*4. So every number is divisible by 4.
That's why gcd(4,8,12,16,20) = 4 .

E. Mahir's Treat

Time Limit – 1 seconds

Mahir Kabir is the most popular senior among his juniors . But his university is going to end soon so he is planning to treat all of his juniors . But Some of them had problems with others rather we can say each person has some dissatisfaction with others . Which can be describe as dissatisfaction factor .

Say dissatisfaction factor are given as **dij**. **dij** means the dissatisfaction factor according to person **i** towards **j**. If the value is negative that means **ith** person likes **jth** person. Positive value means **ith**person hates **jth** person. 0 means **ith** person is neutral about **jth** person. Obviously **dij** can be different from **dji** since **ith** person may like **jth** person, but **jth** person may not like **ith** person and vice versa.

Now, if Mahir groups some people, the dissatisfaction factor is the summation of all the members' dissatisfaction factors towards other people in the group. Mahir has to group them with minimum dissatisfaction factor. he can make as many groups as he like .

Mahir wants to treat all of his juniors with minimum dissatisfaction factor . Can you help him .

Input :

Input starts with an integer **T (≤ 50)**, denoting the number of test cases.

Each case starts with a line containing an integer **n (2 ≤ n ≤ 15)**. Each of the next **n** lines contains **n** space separated integers. The $\mathbf{j}_{th}$ integer in the $\mathbf{i}_{th}$ line denotes $\mathbf{d}_{ij}$. You can assume that $\mathbf{-200 \le d_{ij} \le 200}$ and of course $\mathbf{d_{ii} = 0}$.

Output:

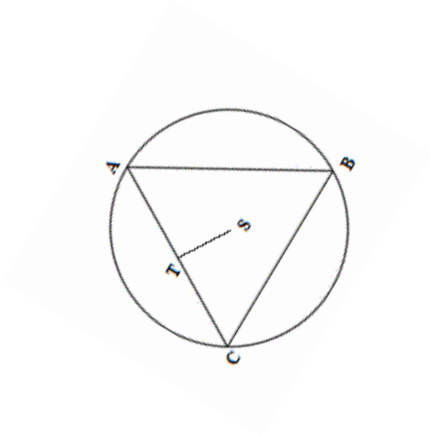
For each case, print the case number and the minimum dissatisfaction factor you can make after grouping them.

Sample Input	Sample Output
2 3 0 2 3 -3 0 5 2 3 0 4 0 -1 -2 -3 1 0 -2 3 1 2 0 -1 2 -2 1 0	Case 1: -1 Case 2: -2

F. Mr. X & Driver Wheel

Time Limit – 1 seconds

Mr. X designs a new driver wheel.



ABC is an equilateral triangle inscribed in circle. **S** is the center of the circle. **ST** is perpendicular to **AC.** He has the circle & the triangle. He needs to bay a **vehicle horn** which length is equal to **ST.** He tells you the length of the sides of equilateral triangle and you tell him the length of **ST.**

Input :

The first line contains test case T (T<=10000).
Next line contains an integer A.
1<=A<=1000000

Output:
Outputs length of **ST** up to 4 digits after decimal point. (Use %.4lf to print the result)

Sample Input	Sample Output
2 2 10	Case 1: 0.5774 Case 2: 2.8868

G. Save lazyM's Job

Time Limit – 1 second

lazyM is working for XYZ company. 1week ago he got a project. Tomorrow is his submission date. He writes below function calculate for this project.

```
double calculate(int n){
   double ans = 0;
   for(double i = 1 ; I <= n ; i+=2){
      for(double j = i ;j <= n ; j++){
         ans += 1./j;
      }
   }
   return ans;
}
```

But when he runs this code for large **n,** he realizes that code is too slow. If he submits this code, he will lose his job. He know you are a very good programmer, he ask you to write an efficient code for function calculate.

Input :

The first line contains test case T (T<=10000).
Next line contains an integer n**.**
1<=n<=1000000

Output:
Outputs the result of calculate (n) up to 4 digit after decimal point. (Use %.4lf to print the result)

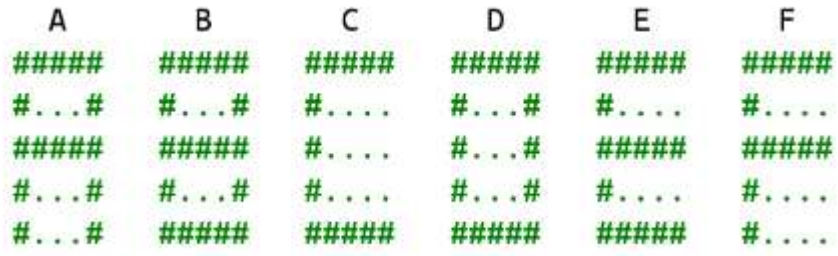
Sample Input	Sample Output
2 1 2	Case 1: 1.0000 Case 2: 1.5000

G. Reverse Printing Problem

Time : .5 second

Problem Statement

You are given one of the following matrices. Now, you've to find out which alphabet does the given matrix represent. But, there's a catch! One of the column in the given matrix will be missing!!



Input

Input starts with an integer **T**(< 20), denoting the number of test cases. Then **T** test cases will follow.

Each test case will contain 5 rows. Each row will contain four characters, either a '.' or a '#'

There will be a blank line before every test cases.

Output

For each case, print the case number and the alphabet (in upper case) that represents the matrix. Print "Ambiguous" if more than one alphabet can represent the matrix.

Input	Output
2 #### ...# #### ...# ...# #### #... #### #... #...	Case 1: A Case 2: Ambiguous

I. Handshaking

Time Limit – 1 second

Inside a park, there are R rows of benches where each row can hold a capacity of S people. We can imagine the seating order as a matrix sized R x S where each element represents either a person or an empty seating space.

Let's assume that each person shakes hands with their neighbors. That means the neighbors are located in one of the eight neighboring elements (if such element exists).

A seating order of the people inside the park has been given before you enter. You, of course, late for the morning gathering and will sit in an empty space so that you shake hands with **as many people as you can**. If there are no empty seats left, you will not seat.

We can assume that nobody enters the park after you. Calculate the total number of handshakes that might have.

Input:

The first line of input contains positive integers **R and S (1 ≤ R, S ≤ 80)** as stated above.
Each of the following R lines contains S characters. These R x S characters represent the seating order. The character '.' (dot) represents an empty place and the character 'x' (lowercase letter x) represents a person.

Output:

For each test case, output one line containing "Case **cs**: ", where **cs** is the test case number, followed by the total number of handshakes that have occurred.

See the sample I/O.

Sample Input	Sample Output
2 **2 3** **..x** **x..** **2 2** **xx** **xx**	**Case 1: 2** **Case 2: 0**