A. Coca-Cola

Score: 1

CPU: 1s
Memory: 1024MB

There are many people who are fond of soft drinks. Like many college students, Arya is very fond of soft drinks especially coca-cola. Today is Arya's birthday. So she has made a plan for arranging a soft drink party in the evening in which she has invited some of her close friends . Arya has **M** taka and she wants to buy **N** coca-cola for the party. Each coca-cola costs **K** taka. Now, your task is to find out whether she has sufficient money to buy N coca-cola or she has to borrow some money in this purpose.

Input

The first line contains a single integer **T**($1 \leq T \leq 50$), the number of test cases.
Each of the next T line contains three positive integers **M**, **N**, **K** respectively. ($1 \leq N, M, K \leq 1000$)

Output

For each set of input print case first. Than print "**Yes**" if she can manage to buy N coca-cola with her own money. Otherwise print "**No**". See sample output format.

Sample

Input	Output
3 100 7 10 300 20 15 500 50 20	Case 1: Yes Case 2: Yes Case 3: No

B. All About The Base

Score: 1

CPU: 1s
Memory: 1024MB

Meghan is a primary school student. Recently she came to know that there are several number system other than decimal number. Now she wants to know what a decimal number is in some other base. So she wants your help to write a program that will convert the decimal number to given base.

For example, decimal number 1234 is 4D2 in 16 base number system and 10011010010 in base 2 number system.

Input

Input starts with an integer T($\leq$100), number of test cases.

Each case will contain two non-negative integers **b** ($2 \leq b \leq 16$) and **n** ($\leq 2^{16}$) where **n** is a decimal number and **b** is the base in which you have to convert the number.

Output

For each test case, print test case number and then output number.

Sample

Input	Output
3 16 1234 5 7 2 55555	Case 1: 4D2 Case 2: 12 Case 3: 1101100100000011

C. Anagram Count

Score: 1

CPU: 1s
Memory: 1024MB

Angie is a little girl preparing for Code It Girl's Programming Contest. She is learning anagrams nowadays. An anagram of a word can be made by rearranging the letters of the word. ie. Two words are called anagrams if the letters of one word can be rearranged to form the other word. For example, the letters of the word "localbus" can be rearranged into "blocusal". Hence "localbus" and "blocusal" are anagrams to each other. However the word "privatecar" is not an anagram to "localbus". Now Angie has some string. She is wondering how many unique anagrams to the strings may exist. As she is new to programming, she needs your help.

Input

The first line of input contains an integer T (<=50), denoting the number of test cases.

Each case contains a string S. The length of S will be between 1 to 9. The string will contain only lowercase English characters.

Output

For each case output the case number and the number of unique anagrams to S. See the sample input/output for I/O format.

Sample

Input	Output
3 ab aab localbus	Case 1: 2 Case 2: 3 Case 3: 20160

D. Snotlout and Stones

Score: 1

CPU: 0.4s
Memory: 1024MB

Toothless, Stormfly and Meatlug - all three are sent to the west of Berk Island carrying **a**, **b** & **c** number of stones respectively, to help the Vikings to build up a pool. Snotlout is disturbing Hiccup and making trouble with his dragon, Hookfeng. So, Hiccup decided to keep him busy. He asked Snotlout to tell him the values of **a**, **b** & **c**.

To give him a clue, Hiccup told him a number which is equal to $\mathbf{a^2-b^2-c^2+2bc}$. Snotlout is not that much fool and within seconds he found out that there may be many triples of **(a, b, c)**. Fishleg felt little sympathetic for Snotlout and gave him another clue that no other dragon is carrying more stones than Toothless as he is the most powerful of them. It is assured that they all are carrying at least one stone. One dragon may carry same number of stones with other dragons. Now, Snotlout himself becomes curious to find out how many triples are there. Help Snotlout! (A triple is different from another, if at least one element of the triple is different to the corresponding element of the other triple.)

Input

A positive integer T, which is number of test cases. ($T \leq 100$)

Each of the following T lines contain a single integer **N** denoting the value of $\mathbf{a^2-b^2-c^2+2bc}$. ($0 < N \leq 10^{12}$)

Output

For each case, print the case number and a single integer telling the number of different triples of **(a, b, c)**.

Sample

Input	Output
3 5 15 99	Case 1: 2 Case 2: 8 Case 3: 26

E. Mr. Baten The Mayor

Score: 1

CPU: 4s
Memory: 1024MB

Mr. Baten is a mayor of a city named EERT. He wants to employ some new people in his office at various department. No departments are allowed to share information with other departments without Mr. Baten's acknowledgement. But people in his city, for every two people, they are directly connected to each other or they have some mutual person in between them. But their connection never create loop. Due to these connection everyone knows everything. But Baten can't employ people who have a friend in another department. So he want's to kill some people to make maximum number of sub-group in his city, so he can employ one person from each group. But can kill max K people. Killing more than K people will put the city in chaos. As Baten's friend you need to find the best option to kill to maximize the group. You need to find the number of maximum group Mr Baten can create with lowest casualty.

Input:

First line of the input in an integer T<100 (Total Number of test case)

Every integer starts with two integer N, K (`1<N,K<100000`) denoting number of people and maximum killing option respectively. Next N-1 contains two integer u, v (`1<=u, v<=N`) (direct friendship between u and v)

Output:

For every test case there will be a single line output. `Case X: Y` where `X` is the case number. And `Y` is the maximum group.

Sample

Input	Output
3 4 2 1 2 1 3 1 4 4 1 1 2 2 3 3 4 2 1 1 2	Case 1: 3 Case 2: 2 Case 3: 1

Use faster IO.

F. Raju De Mastor

Score: 1

CPU: 3s
Memory: 1024MB

Mastor Raju is teaching his class Mathematics and today's lesson is progression. In mathematics, an arithmetic progression is a sequence of numbers such that the difference between the consecutive terms is constant. For instance, the sequence 5, 7, 9, 11, 13, 15 ... is an arithmetic progression with common difference of 2. (Sequence with only one element is also an arithmetic progression) After finishing the class Mastor Raju announces that tomorrow there will be a test on progression. Moreover, he also gives some spoilers. He briefly describes the problem as following -

He will provide them with some sequence and ask queries about some range in that sequence. For such range queries students have to tell whether that range is an arithmetic progression or not. And also he'll update the value at some position of that sequence from time to time.

But tonight in Cricket All Star Tournament there is a match between Sachin's Blasters and Warne's Warriors. And who wants to miss out on that one?

So the Giringi students came up with an idea of putting this task on oDesk. Are you up for some easy money?

I/O Format:

First line of input will contain T($T \leq 20$), the number of test cases.
First line of each test case will contain N `(N ≤ 100000)` and `Q (Q ≤ 100000)`, number of numbers in the sequence and number of Queries.
Next line will contain N numbers, the initial sequence where each number is not greater than 1000000.
After that, there will be Q queries of two types. For queries of type `0 a b (1 ≤ a ≤ b ≤ N)` you have to print `Abar Jigay` if the sequence is arithmetic progression and `Kobi Ekhane Nirob` otherwise. And for queries of type `1 a b (1 ≤ a ≤ N, 1 ≤ b ≤ 1000000)` you have to update the a-th position in the sequence by the value b.

Sample

Input	Output
1 5 5 1 2 3 4 5 0 1 5 1 3 9 0 1 5 1 2 5 0 1 3	Abar Jigay Kobi Ekhane Nirob Abar Jigay

Use faster Input/Output method

G. Pen Fight

Score: 1

CPU: 1.5s
Memory: 1024MB

In school life, every student has experienced the historical pen fight game. In this game, two or more players play with their pens on any surface like table and hit their pen with finger to knock down opposition's pen. Now a pen fight competition is going to take place for girls in Bangladesh.

The rule of this game is pretty different from typical pen fight game. Here each competent indexed from 1 to N is given one pen each indexed from 1 to N initially i.e. i^{th} competent will get i^{th} pen. The judge of this tournament assigns score for each pen which is given as an array S of N elements $S = \{S_1, S_2, S_3...., S_n\}$ where S_i denotes the score of i^{th} pen. At each round, only two players play against each other. The player who has pens with total scores greater than other one, will win this round and take all the pens of opponent and all the opponent's score will be added with the winner's score. Note that, if two players have pens with same score or any of the players has no pen, no round will take place and nothing will happen.

Now Muna is a spectator of this event and very fond of query. She has been given three types of query based on this tournament. First format of query is **1 X Y** which means **X** will play against **Y**. Second query is **2 X** – the number of pen X^{th} player currently owns. And the third type of query is **3 X**– the index of the player who currently holds the X^{th} pen. There will be no output for query type 1, only for query type 2 and 3, corresponding output has to be printed. Help Muna.

Input

There is an integer T in the first line which represents the number of test cases. Next line will contain N which represents the number of players followed by N space separated integers which represents the scores of pens. i^{th} integer represents the i^{th} pen's score. Next line will contain an integer Q which represents the number of query Muna has to answer. Next Q lines will contain the three types of query discussed above (See sample test case for more clarification)

Constraint

$1 \le T \le 15$
$1 \le N \le 10^5$
$1 \le Q \le 10^4$
$1 \le S[i] \le 10^2$

Output

Output the answer of second and third type query in each line.

Sample

Input	Output
1 5 3 4 5 8 7 3 1 1 2 2 2 3 1	2 2

In above case, in first query, player 1 and 2 play against each other. As player 1 has pen with score 3 and player 2 has pen with score 4, player 2 will win and take the pen of score 3 from player 1. After this round, player 2 will gain total score 4 + 3 = 7 and player 1's score will be 0. In the second query, player 2 owns 2 pens (pen with score 3 and score 4). In the third query, 1^{st} pen (score 3) is owned by player 2 now.

Use faster Input/Output method.

H. Children's Game

Score: 1

CPU: 1s
Memory: 1024MB

Ayesha and her cousin Rebeka are bored of playing UNO. Ayesha asks Rebeka if she has any idea of playing something new. Last night Rebeka was playing a weird game with some of her weird friends and proposed Ayesha to play. It is a two player game. There will be **N** pairs of integer. Player will take turns and in each turn a player need to choose a pair and subtract a number from exactly one of the value of the pair. One who couldn't subtract will lose the game. The rules of the game are given below:

1. Player need to choose a pair.
2. If the pair is **(a,b)** then (s)he can choose either **a** or **b**.
3. If (s)he choose **a** then (s)he can only subtract a divisor of **b (other than 1 and b)** from **a**.
4. If (s)he choose **b** then (s)he can only subtract a divisor of **a (other than 1 and a)** from **b**.
5. Player can only subtract a number **s** from a number **n** if **n > s**.

After describing the rules to Ayesha they have started to play. Ayesha will take the first turn. As the game is totally new to Ayesha and she don't want to lose to her cousin, she asks your help. You need to find who will win if both players will play optimally. If Ayesha wins you also need to find the first move of Ayesha. Piece of cake right? Let's make it a little bit complicated. The rules of finding the first move of Ayesha are given below:

1. If there are multiple first move you need to maximize the value she subtracts in her first move.
2. If there is still tie then you need to minimize the maximum value of the pair she chooses first.
3. If there is still tie then you need to maximize the minimum value of the pair she chooses first.
4. If there is still tie then take the pair with smallest position.

Input

Input starts with a positive integer **T($1 \leq T \leq 100$)**, denoting the number of test cases. Each test case starts with an integer **N($2 \leq N \leq 1000$)** denoting the number of pairs. Each of the next **N** lines contains two positive integer a_i and b_i denoting the pair **($2 \leq a_i, b_i \leq 1000$)**

Output

For each test case, if Rebeka wins print the output in the format, "Case #t: Rebeka wins!" otherwise "Case #t: Ayesha wins!" (without the quotes) in a separate line. Here **t** is the case number starting from 1. If Ayesha wins you need to print another output in the format "p s" (without the quotes) in a separate line. Here **p** is the position of the pair starting from 1 and **s** is the value Ayesha need to choose for subtracting in her first move. Look at the sample input output for more information.

Sample

Input	Output
2 3 2 10 5 5 3 7 5 7 4 5 3 20 10 7 5 10 20	Case #1: Rebeka wins! Case #2: Ayesha wins! 3 5