

Virtual Contest 1 for Newbies

A. MAK Saved The Day

One day Google's Co-Founder Sergey Brin got into a problem. He was looking for a strong password but he could not find any. So he asked all his google mates to help him to find a strong password. All of his Google mates sent him a password suggestion. He got about 1000 responses! After having those responses he saw that most of the passwords were not very strong. He copied all those suggestions in a text file, and asked his close Google mate Muntasir Azam Khan to find those passwords which met the criteria of strong passwords. Mr. Muntasir Azam Khan made a program in DART language and used it to examine those strong passwords.

But now Sergey Brin wants a program in C++/C/JAVA and does not want to bother Mr. MAK as he has much work to do. So he asked you, a future Google developer to write this program for him. The criteria of a strong password is as follows:

1. String size should be at least 6.
2. Characters “:”, “;”, “+”, “-” must not be used..
3. At least 2 Numerical Digit in the string [0-9].
4. At least 3 [A-Z] characters are in UPPERCASE.
5. At least 1 [a-z] character is in lowercase.
6. Space between the characters is permitted.

As an Example : “AbC 12 S” is a Strong password, but “ABC1+c” is not.

Input

In the input text file there will be several lines in which password suggestions are given. There will be at most 100 lines. Each line will consists of at most 100 characters. Input will be terminated by EOF [End of File]

Output

At first you need to output the total number of Strong Passwords, then from the next line you need to output those valid Strong Passwords as they were given. Print each password in separate lines. [Dont break the original sequence]

Input	Output
ABCDEFGHijklm123 A123DdC abd AAAAABBBB11223ASD	2 ABCDEFGHijklm123 A123DdC

Problem Setter: Ahmad Faiyaz

B. Math World

There was a country named Math. The king of Math was Jenon. He was a mathematician. In Math, everyone's name is in one word. The king found that there are many people in same name

in his country and these are making problem to identify the people. So, he decides that all people of his country will be renamed by a number. So, he changed his name to 1 and ordered all his people to register their names in country's register office. In few days, all people changed

their name by number and the king was very happy.

In ID card, there was a field named "Senior Than". In this field, the number was denoting that this ID card holder is senior than that amount of people. Suppose, there are two people renamed with "X" and "Y". So, according to king's law X & Y will be two numbers. X will be senior of Y, if $(X \% Y) == 0$. A rule is that a people can't be senior than the king or himself. But, the king is senior than all.

With in few days, the king came to know that there are many people in his country who are senior than 0 people and they are pretty much upset for this reason. So, king called a meeting to those people who are senior than 0. All the people of this type came to the meeting. There, they were given a new serial number called "PID" for some other purpose according to their name's order. Example, if there are only 3 people named 30, 42, 10 then according to their name's order 10's PID=1, 30's PID=2 & 42's PID=3. There are about 1000000 people in math world.

Now, the king wants to know if he called someone with PID then who will come. There is no programmer in math world, so the king has come for your help.

Input

There will be a number denoting the test case T. $1 \leq T \leq 50000$.

In each case there will be a number N representing the PID. $1 \leq N \leq 75000$.

Output

For each case, print the case number and the name of that people bearing that PID "N". See the samples for exact formatting.

Input	Output
3 1 2 5	Case 1: 2 Case 2: 3 Case 3: 11

Problem Setter: Ariful Haque Efath

C. Date, Everyday!

We all know Tarif – a brilliant programmer. What we don't know about him is that he has recently gained interest in dating. With the help of his wingman, Syrus, he now has managed to earn the trust of lots of “unicorns”.

All the “unicorns” are now dying to have a date with him. Now, for each “unicorn”, Tarif came up with a number which he calls the fun value. Everytime he dates a “unicorn”, her fun value is halved (any remainder is discarded). He now wants to date all the “unicorns” until all their fun value reaches 0. Bad Tarif! But what can you do anyway. You being a young programmer have no choice but to help him. He wants you to find the number of times he has to date to achieve his desire.

For example this month he has to date 2 “unicorns” with fun value 5 and 2. When he dates the first “unicorn”, her fun value decreases from 5 to 2. When he dates her again, it becomes 1, and on the third date, it becomes 0. Similarly, it takes two dates to decrease the fun value of the second “unicorn” from 2 to 0 (first 2 to 1, then 1 to 0). So he has to date the first “unicorn” 3 times and the second “unicorn” 2 times, totalling to 5 dates.

Input

The input starts with T (< 30), the number of test cases that follows. Each case starts with a positive integer N (< 25) and is followed by a line of N integers – the fun values for the N “unicorns”. Each fun value is positive but never greater than 100.

Output

For each case you have to output a line containing “Case X: Y” where X is the case number and Y is the total number of dates he needs to do in order to reduce all the “unicorns” fun value to zero.

Sample

Input	Output
3 2 5 2 3	Case 1: 5 Case 2: 9 Case 3: 24

2 6 9 8 2 8 3 6 4 8 9 3	
-------------------------------	--

Problem Setter: Mahmud Ridwan

D. N Plus Plus

“The process of preparing programs for a digital computer is especially attractive, not only because it can be economically and scientifically rewarding, but also it can be an aesthetic experience, much like composing poetry or music” - Donald E Knuth.

A long long time ago, when Fahim the Great first started solving problems in Online Judges, he found most of the problems difficult! He spent nights after nights thinking about solutions for many interesting problems, but to no avail. One day he found a very easy problem (at least to Fahim)! The problem asked him to convert decimal (base 10) numbers to binary (base 2) numbers. For example, 13 in decimal can be written as 1101 in binary.

Obviously the same number written in different bases can look different. Say, 255 in decimal can be written as FF in hexadecimal (a number with base 16) and 11111111 in binary. Fahim was really happy to see this problem as he already knew how to convert a number from one base to another. So he jumped into the keyboard and solved the problem in a flash! In the next few days, he found out all the problems that asked for a base conversion and solved each one of them! But not everybody took his success positively. Fahim's rival TI Sunny was furious about Fahim's progress and thrown him a difficult base conversion problem. He asked Fahim to write a number $N + 1$ in base N . Fahim scratched his head for a while and came up with a brilliant solution! Now you are going to solve this exact problem!

Input

The first line of input is the number T ($1 \leq T \leq 5000$), where T is the total number of test cases.

In each of the next T line an integer N ($2 \leq N \leq 10^9$) is given.

Output

Print a number in a line by itself, which represents the number $N + 1$ in base N .

Sample

Input	Output
2 10 10	Case 1: 11 Case 2: 11

Problem Setter: Tarif Ezaz

E. Math World (II)

From the problem “Math World” you may know about the country math world and the king Jenon. You also know that in that country now all the people are named with a number. King Jenon is 1, others are 2, 3, 4, 5, 6...

In the problem “Math World” some people were given a special ID called PID (Prime ID). According to this the PID 1 is 2, PID 2 is 3, PID 3 is 5 etc. So if the king called PID 2, then 3 will come. Actually this is just the serial of prime numbers.

Now, a new disease named “11” has attacked in math world. Whose name contains “11” has been affected by this disease and died. Like the people 11, 111, 1011, 10110 has been affected and died. So, the registry of PID has been re-updated and the new PID has been given to the PID holder people.

The king still wants to know if he called someone with PID then who will come. As, there is no programmer in Math World, so the king has again come to you for a new program as after the update of registry, the old one gives the wrong answer.

Input:

There will be a number denoting the test case T. $T \leq 50000$.

In each case there will be a number N representing the PID. $N \leq 73500$.

Output:

For each case, print the case number and the name of that people bearing that PID “N”. See the samples for exact formatting.

Sample Input:

3
1
2
5

Sample Output:

Case 1: 2
Case 2: 3
Case 3: 13

Problemsetter: Ariful Haque Efath

F. Ajob Message

Mr. & Mrs. Khan are tensed about their girl named “Katrina”. They think that their daughter has an affair, but they are not getting the proof. Recently, Mrs. Khan has found some text message in her daughter’s phone but she is unable to figure out the meaning of it! It seems strange to her. So, he discuss about it with Mr. Khan. Mr. Khan has a sharp brain than Mrs. Khan. :p So, he

figure out that there are some secret messages.

You are very popular as a message decoder, so Mr. Khan has come to you and has given those messages. Now, he wants to know that her daughter has an affair or not.

Now, your job is to write a program to decode those messages. So, you find out the message pattern.

Message pattern:

1. It contains only numeric digits.
2. Every 3 digits represent a character in ASCII value.

*** As you like love story and affairs, so you confirmed Mr. Khan that her daughter has no affair. :p

Input:

There will be a number denoting the test case T. $T \leq 100$. In each case there will be a number with $3*N$ length. $N \leq 100$.

Output:

For each case, print the case number and the decoded message. See the samples for exact formatting.

Sample Input:

3

084104105115032105115032097032116101115116032109101115115097103101046
068101099111100101032105116044032105102032121111117032099097110046
0771011011160321091010321161111091111141141111190440321050321191051081080321
190971051160321021111114032121111117032105110032099097102101046

Sample Output:

Case 1: This is a test message.

Case 2: Decode it, if you can.

Case 3: Meet me tomorrow, i will wait for you in cafe.

Problemsetter: Ariful Haque Efath

G. SHELDONOPOLIS

People in Sheldonopolis are quite strange in nature, may be because they are not naturally born human. They are artificially cloned by combining the DNA of their Supreme Leader Dr. Sheldon Cooper, B.S., M.S, M.A., PhD, ScD, a Caltech Theoretical Physicists and Dr. Amy Farrah Fowler, a neurobiologist, whom Dr. Cooper refers to as **“my friend, but not my girlfriend”**. The city of Sheldonopolis is protected by **six** Sheldon Towers, which is guarded by the Sheldonian Army 24/7. As the supreme leader of Sheldonopolis, it is Dr. Cooper’s responsibility to maintain perfect security throughout the city. As part of the process, he wants to calculate the time the guards would take to gather around for an assembly at the Sheldon Square. Since

Dr. Cooper is too busy with his research on String Theory, the theory of everything, he wanted Mr. Howard Wolowitz, who just has a Master's Degree, to do it for him and Mr. Wolowitz refused to do so. Hence, Dr. Cooper's has asked for your help in solving his problem.

The city can be modeled as a square grid of size **N x M**. Each cell of the grid consists of one of the following.

.	An Empty Space
#	An Wall
@	Sheldon Square
T	Sheldon Tower

Assuming that, there is only guard in each Sheldon Tower and each guard takes one unit of time to move to the surround grids. They cannot move through the walls. Calculate the minimum time needed for all the guards to reach the assembly. The guards can only move either horizontally or vertically along the grid.

INPUT:

The first line of the input contains the number of the test cases $T(1 \leq T \leq 100)$. Each case starts with a line with two integers N which denotes the number of rows and M which denotes the number of columns ($1 \leq N, M \leq 150$). Each of the next N lines contains M characters which describes the city of Sheldonopolis.

OUTPUT:

For each print the case number and the minimum time the guards need to gather at the assembly



INPUT	OUTPUT
1 7 9 ##### #T..T..T# #.....# #T..@..T# #.....# #T..T..T# #####	Case 1: 5

Problemsetter: Arman Kamal

H. A Simple Calculator

Do you know that , NSU Students made a calculator which can show Bangla Digits, and can do all basic arithmetic operations like addition, subtraction, multiplication, division. Now You need to do this all arithmetic operations in a computer program. One will give some commands , and you program should work , according to the commands. Commands are:

1. A : Addition
2. S: Subtraction
- 3: M: Multiplication

BTW , No Division Command is available so , you don't need to do that.

now see the input and output format .

INPUT:

at first you will be given number of testcases T ($1 \leq T \leq 15$), then you will be given a number N which is the number of commands, ($0 \leq N \leq 100$) , then next N lines you will be given the command and a number. Commands will be 'A', 'S', 'M'. Each number will lie between [0,1000000] all are integers. Initially the result is 0

Output:

You need to print Case no and the total result. See the output format.

INPUT	OUTPUT
2 4 A 2 S 1 M 5 A 2 0	Case 1: 7 Case 2: 0

Clarification: at first the result is 0, then Add 2 with the result , you get $0+2=2$, then Subtract 1 from the result , you get $2-1=1$, then Multiply the result with 5 , you get $1*5=5$, then add 2 with the result is $5+2=7$, that is final.

in test case 2, you have no commands, and initially your result is 0 , so that is your final result.

Problemsetter: Ahmad Faiyaz

I. Harry Potter and the Horcrux

Harry Potter is finding Horcruxes of Voldemort to kill him. He is now searching the last horcrux , if he can find the last one he can kill Voldemort. Now He is now at 1 no city and different times Horcrux is at different cities. But he knows in which city , the Horcrux can be found. Now He has map of the country. Now , your task is according to the map,find out is it possible to reach that city by walk only.

Input:

Input starts with an integer **T** (≤ 10), denoting the number of test cases.

Each case starts with three numbers **n** ,**m** and **d** . These indicate the number of cities ($1 \leq n \leq 1000$) ,the number of edges ($0 \leq m \leq 2000$) , and the destination ($1 \leq d \leq n$). The cities are numbered from 1 to n. Next m lines represents 2 numbers , u and v . It means that there is an edge between u to v [One directional].

Output:

For each case, print the case number first. Then print "YES" if it is possible to reach the destination, "NO" if it is not. See the output format.

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

Problemsetter: Ahmad Faiyaz