Problem A

Cycle length in decimal expansion

Time limit: 1 sec.

Problem Description

Given integers p<=q in which p>=0 and q>0, find the cycle length in the decimal expansion of p/q. For example, 1/7=0.142857142857…, the cycle length is six; and 1/3=0.333…, so the cycle length is one. Note that 1/2=0.5 which can also be expressed as 0.500…, and we assume the length is one.

Input Format

The input consists of several cases. Each case contains two integers p and q in one line. We assume that 0<=p<=q<=1000100.
The case with q=0 ends the input, and you don't need to compute this case.

Output Format

For each case, print the cycle length in one line.

Example

Sample Input	Sample Output
1 7 2 3 1 1 2 0	6 1 1

Problem B

MAX Area

Time limit: 3 sec

Problem Description

給定平面上一些點，以任意兩點為對角頂點均可訂出一個平行於 X 與 Y 軸的矩形，請求出哪兩個點定義出的矩形面積最大，注意，如果兩點有相同的 x 座標或 y 座標則定義該矩形之面積為 0。

Input Format

第一列有一個正整數 n 代表共有 n 組測試案例。接下來每一組測試案例的第一列是一個整數 m 表示此測試案例有 m 個頂點，接著的 m 列每一列是一個頂點座標，每個座標是兩個介於-1000~1000 的整數並以一個空格區隔，頂點個數不超過 50。

Output Format

針對每一組測試案例，輸出最大矩形的面積，每組測試案例輸出一列。

Example

Sample Input	Sample Output
2 3 0 0 10 10 12 15 2 0 1000 -1000 1000	180 0

Problem C

Fibonacci

Time limit: 1 sec

Problem Description

Fibonacci is well known. This is a similar task. Let f(3)=f(2)=f(1)=1, and F(i)=a*f(i-1)+b*f(i-2)+c*f(i-3) for all i>3, where a, b, and c are given constants. Given a positive integer n and a prime p, find f(n) (mod p)

- The number of test cases is at most 10.
- a, b, and c are positive integers less than 10.
- n and p are positive 31-bit integers.

Input Format

The test file contains several test cases. Each line is a test case and contains 5 integers n, p, a, b, and c, separated by a space.

Output Format

For each test case, output the result in one line.

Example

Sample Input	Sample Output
6 7 1 2 3	5

Problem D

One on one

Time limit: 5 sec

Problem Description

There are n enemies and you have also n soldiers. Every enemy or soldier has a power value which is an integer between 0 and 60000. When a solder an enemy, the one with higher power value wins. You need to assign each soldier to one enemy so as to maximize the number of wins. Note that each soldier can only meet one enemy and there is no winner if their power values tie.

Input Format

There are several test cases. Each case consists three lines: the ¯rst line is the number n; the second line contains n integers which are the power values of the enemies; and the third line contains the power values of your soldiers. The value of n is at most 10000. The case with n = 0 terminates the input ¯le and you need not handle this case.

Output Format

For each test case, output the maximum number of wins in one line.

Example

Sample Input	Sample Output
4 1 2 3 4 2 2 2 2 3 1 2 3 4 3 2 5 10 10 10 10 10 9 9 9 9 9 0	1 3 0

Problem E

Delivery problem

Time limit: 3 sec.

Problem Description

A deliveryman has to send N boxes to N different customers. Each box belongs to one customer. All the boxes are now in the warehouse. Each time he can carry one box to its owner, go back to the warehouse, and then deliveries another box. The travelling time from the warehouse to the i-th customer is t(i), and it takes the same time to go back. Also we assume that there is no other time to be considered. The deliveryman wants to determine the delivery sequence such that the total waiting time of all the customers is minimized, where the waiting time of a customer is the time from now to the time he receives his box.
For example, if there are three boxes and the travelling times are t(0)=20, t(1)=10, t(2)=30. The best sequence of the box indexes is (1,0,2). The waiting times 10, 40, and 90, respectively, which gives a total waiting time 140. Write a program to compute the minimum total waiting time.

Input Format

The input consists of a number of test cases. The first line is an integer T which is the number of test cases, and the test cases follow one by one. The input of a test case consists of two lines. The first line contains an integer N, 0<N<=1000, which is the numbers of boxes to be delivered. The second line consists of N integers, which are t(0), t(1),…,t(N-1). Two consecutive numbers are separated by one space. All the input and output numbers in this problem are 32-bit integers.

Output Format

Output the total waiting time in one line.

Example

Sample Input	Sample Output
1 3 20 10 30	140

Problem F

Different-Digit number

Time limit: 2 sec

Problem Description

一個正整數如果它的每一位數都不相同，我們稱它為 different-digit number，例如 1, 10, 14, 105 都是，反之 11, 100, 2872 都不是。輸入一個正整數 N，請計算有多少小於或等於 N 的 different-digit number。

Input Format

輸入第一行是測資筆數，以下每一行是一筆測資。一筆測資是一個不超過 1000000 的正整數。

Output Format

每筆測資單獨一行輸出答案。

Example

Sample Input	Sample Output
2 10 100	10 90