Greetings From Globussoft

- Given below are 5 Programming questions, you have to solve any 3 out of 5 questions.

- These 5 questions you can attempt in any technology like C/C++, java, .Net, PHP

- To solve these 3 questions you've max. 3 hours.

- While Solving these questions you are not allowed to use any Search Engine like Google, Yahoo, Bing ...

All the best for your test

Globussoft

QUESTION - 1

Dear Uncle Jack is willing to give away some of his collectable CDs to his nephews. Among the titles you can find very rare albums of Hard Rock, Classical Music, Reggae and much more; each title is considered to be unique. Last week he was listening to one of his favorite songs, Nobody's fool, and realized that it would be prudent to be aware of the many ways he can give away the CDs among some of his nephews.

So far he has not made up his mind about the total amount of CDs and the number of nephews. Indeed, a given nephew may receive no CDs at all.

Please help dear Uncle Jack, given the total number of CDs and the number of nephews, to calculate the number of different ways to distribute the CDs among the nephews.

Input

The input consists of several test cases. Each test case is given in a single line of the input by, space separated, integers N (1 <= N <= 1000) and D (0 <= D <= 2500), corresponding to the number of nephews and the number of CDs respectively. The end of the test cases is indicated with N = D = 0.

Output

The output consists of several lines, one per test case, following the order given by the input. Each line has the number of all possible ways to distribute D CDs among N nephews.

Example

Input:

```
1 20
3 10
0 0
```

Output:

```
1
59049
```

QUESTION – 2

BuggyD suffers from AIBOHPHOBIA - the fear of Palindromes. A palindrome is a string that reads the same forward and backward.

To cure him of this fatal disease, doctors from all over the world discussed his fear and decided to expose him to large number of palindromes. To do this, they decided to play a game with BuggyD. The rules of the game are as follows:

BuggyD has to supply a string **S**. The doctors have to add or insert characters to the string to make it a palindrome. Characters can be inserted anywhere in the string.

The doctors took this game very lightly and just appended the reverse of **S** to the end of **S**, thus making it a palindrome. For example, if **S** = `"fft"`, the doctors change the string to `"ffttff"`.

Nowadays, BuggyD is cured of the disease (having been exposed to a large number of palindromes), but he still wants to continue the game by his rules. He now asks the doctors to insert the minimum number of characters needed to make **S** a palindrome. Help the doctors accomplish this task.

For instance, if **S** = `"fft"`, the doctors should change the string to `"tfft"`, adding only 1 character.

Input

The first line of the input contains an integer **t**, the number of test cases. **t** test cases follow.

Each test case consists of one line, the string **S**. The length of **S** will be no more than 6100 characters, and **S** will contain no whitespace characters.

Output

For each test case output one line containing a single integer denoting the minimum number of characters that must be inserted into **S** to make it a palindrome.

Example

Input:
```
1
fft
```

Output:
```
1
```

QUESTION – 3

A fashion show rates participants according to their level of hotness. Two different fashion shows were organized, one for men and the other for women. A date for the third is yet to be decided ;) .

Now the results of both fashion shows are out. The participants of both the fashion shows have decided to date each other, but as usual they have difficuly in choosing their partners. The Maximum Match dating serive (MMDS) comes to their rescue and matches them in such a way that that maximizes the hotness bonds for all couples.

If a man has been rated at hotness level `x` and a women at hotness level `y`, the value of their hotness bond is `x*y`.

Both fashion shows contain **N** participants each. MMDS has done its job and your job is to find the sum of hotness bonds for all the couples that MMDS has proposed.

Input

The first line of the input contains an integer **t**, the number of test cases. **t** test cases follow.

Each test case consists of 3 lines:

- The first line contains a single integer N (1 <= N <= 1000).
- The second line contains N integers separated by single spaces denoting the hotness levels of the men.
- The third line contains N integers separated by single spaces denoting the hotness levels of the women.

All hotness ratings are on a scale of 0 to 10.

Output

For each test case output a single line containing a single integer denoting the sum of the hotness bonds for all pairs that MMDS has proposed.

Example

Input:

```
2
2
1 1
3 2
3
2 3 2
1 3 2
```

Output:
5
15

QUESTION – 4

BuggyD loves to carry his favorite die around. Perhaps you wonder why it's his favorite? Well, his die is magical and can be transformed into an N-sided unbiased die with the push of a button. Now BuggyD wants to learn more about his die, so he raises a question:

What is the expected number of throws of his die while it has **N** sides so that each number is rolled at least once?

Input

The first line of the input contains an integer **t**, the number of test cases. **t** test cases follow.

Each test case consists of a single line containing a single integer **N** (1 <= **N** <= 1000) - the number of sides on BuggyD's die.

Output

For each test case, print one line containing the expected number of times BuggyD needs to throw his **N**-sided die so that each number appears at least once. The expected number must be accurate to 2 decimal digits.

Example

Input:
2
1
12

Output:
1.00
37.24

QUESTION – 5

Dhamaka Singh (a crook) has just robbed a bank and would like to get out of the country as soon as possible. But there is a slight problem, the police! On his way out of the country he has to pass through some police stations. Each police station has a certain risk (for Dhamaka Singh) associated with it. He wants to get to the airport within a certain time **T** or else he'll miss his flight. He also wants to take a path that minimizes the total risk associated with it. Help Dhamaka Singh get out of the country.

Input

The first line of the input contains an integer **t**, the number of test cases. **t** test cases follow.

The first line of each test case contains 2 integers **N** (3 <= **N** 100) and **T** (1 <= **T** <= 250), denoting the number of police stations and the total time he has to reach the airport, respectively.

Dhamaka Singh has to start from the first police station and reach the $\mathbf{N}^{th}$ one (the airport is just after the $\mathbf{N}^{th}$ police station). You can consider the time taken between the $\mathbf{N}^{th}$ police station and the airport to be negligible.

Next there are **N** lines with **N** numbers in each line, separated by single spaces. All numbers are separated by a single space. The j^{th} integer in the i^{th} line represents the time taken to reach the j^{th} police station from the i^{th} police station.

Next there are another **N** lines with **N** numbers in each line. All numbers are separated by a single space. The j^{th} integer in the i^{th} line represents the risk involved in travelling to the j^{th} police station from the i^{th} police station.

Output

For each test case output one line containing 2 integers separated by a single space.

The first integer denotes the minimum total risk to reach the airport. The second integer denotes the minimum time required to reach the airport at the minimum total risk.

If it is impossible to reach the airport within time **T** (inclusive), just print "-1" (quotes for clarity).

Example

Input:

```
1
4 10
0 6 2 3
6 0 2 3
3 1 0 2
3 3 2 0
0 2 2 7
2 0 1 2
2 2 0 5
```

7 2 5 0

Output:
4 9