

KBTU Open 2008

For all problems:

- time limit: 2 seconds
- memory limit: 64 Mb

ID	Problem Name	Input File	Output File
A	Computer Network	computer.in	computer.out
B	Contest	contest.in	contest.out
C	Counter Strike	cs.in	cs.out
D	Fatboy	fatboy.in	fatboy.out
E	Super Heroes	heroes.in	heroes.out
F	Milk	milk.in	milk.out
G	Points	points.in	points.out
H	Sequence	sequence.in	sequence.out

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Problem A. Computer Networks

A company owns a computer network. Any two computers can communicate directly or indirectly. Because the network is old and it was not well maintained, the manager of the company wants to know that is the risk for two computers of the network could not communicate anymore. The company hired you to create a program which using the direct connections between computers determine the minimum number of connections that must be destroyed so that there are at least two computers that cannot communicate anymore.

The input file contains on the first line two numbers n and m , separated by a single blank character, representing the number of computers the network has and the number of direct connections between the computers.

Each of the following m lines contains two numbers, separated by a single blank character, representing a connection between two computers in the network. The computers are indexed using numbers between 1 and n .

The output file must contain a single line containing a single number representing the minimum number of connections that must be destroyed so that there are at least two computers that cannot communicate anymore.

Restrictions

$1 \leq n \leq 100$, $1 \leq m \leq 4950$

computer.in

```
4 4
1 2
1 4
2 3
3 4
```

computer.out

```
2
```

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Problem B. Contest

If n people take part in this contest, how many distinct ranklists there could be? Notice that some contestants may share the same rank.

Input

One n on each line, the number of participants ($1 \leq n \leq 200$). A negative value for n indicates the end of input.

Output

One number on each line, the number of distinct ranklists.

Sample Input

```
1
2
3
-1
```

Sample output

```
1
3
13
```

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Problem C. Counter Strike

In Counter Strike, each team member can buy a large gun, a pistol and some bullets. One clip of bullets will be bought with the gun, and additional bullets should be bought in clips. There is a limit on each kind of bullets so that you can't buy arbitrary number of clips. Each gun has a fixed damage. The HP of each enemy is initially 100.



OldBig is a terrorist who is real sharp and never wastes any bullet. At the beginning of the game, OldBig has nothing but money. He has some choices in buying guns and bullets. He wants to know how many enemies he could kill if he makes a wise choice.

Input

This problem contains multiple tests. Each test starts with two positive integers n ($1 \leq n \leq 40$) and m ($1 \leq m \leq 16000$). n is the number of different guns, and m is the sum of money available. The following n lines contain 6 integers each, specifying information for each type of guns, in the order as follows:

- > a: damage ($1 \leq a \leq 300$)
- > b: price of the gun ($1 \leq b \leq 16000$)
- > c: price of one clip of bullets ($1 \leq c \leq 16000$)
- > d: maximum clips of bullets you can buy ($0 \leq d \leq 10$)
- > e: number of bullets in each clip ($1 \leq e \leq 100$, $0 \leq d * e \leq 300$)
- > f: type of gun, $f = 1$ means large gun, $f = 2$ means pistol

A test with $n = 0$ indicates the end of input, and this test should not be processed.

Output

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One integer on a single line for each test, the maximum number of enemies OldBig could kill.

Sample Input

```
2 4000
20 1000 200 3 30 1
20 2000 200 3 30 2
3 4000
20 1000 200 3 30 1
20 2000 200 3 30 1
20 2200 200 3 30 2
0
```

Sample Output

```
42
36
```

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Problem D. Fatboy

Mirko is, as we know, happily married. During the last month he gained 70 pounds. Because of all the fat stored in his fingers, he has a hard time writing e-mails to his old friend Slavko whom he has not forgotten.

Every night Mirko describes in detail all the things he has eaten on that day, but sometimes he presses more than one key when he only wanted to press one. Every of those accidentally pressed keys can be any key on the keyboard, including the desired key, the keys may repeat and, since Mirko has already gotten used to his disability, the number of accidentally pressed keys along with the desired one will not be more than three.

After he received multiple unreadable e-mails, Slavko asked Mirko to always send e-mail three times so that he can understand it more easily.

Write a program that will help Slavko to determine the longest possible text that Mirko could of written, based on the three e-mails he received.

Input

The input file contains 3 lines of text.

Each of those lines contains one version of Mirko's text. The only characters contained will be non-capital letters of the English alphabet and there won't be more than 100 of them.

Output

The first and only line of the output data should contain the longest possible text that Slavko could determine from the received e-mails.

Note: There will always be a solution, but not necessarily a unique one.

Examples

FATBOY . IN

jueha
judbhak
jukhxa

FATBOY . OUT

juha

FATBOY . IN

asaermxvqav
scanrmab
tstamrmhaqu

FATBOY . OUT

sarma

FATBOY . IN

cecqbhvaiaedpibaluk
cabegviapcihlaaugck
adceevfdadaepcialaukd

FATBOY . OUT

cevapiluk

Source: Croatia 2001

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Problem E. Super Heroes

Thirty five years ago, a group of super heroes was chosen to form the Justice League, whose purpose was to protect the planet Earth from the villains. After all those years helping mankind, its members are retiring and now it is time to choose the new members of the Justice League. In order to keep their secret identity, let's say, secret, super heroes usually use an integer Humberto identify themselves. There are H super heroes on Earth, identified with the integers from 1 to H . With a brief look at the newspapers anyone can find out if two super heroes have already worked together in a mission. If this happened, we say that the two heroes have a relationship. There must be only one Justice League in the world, which could be formed by any number of super heroes (even only one). Moreover, for any two heroes in the new league, they must have a relationship.

Besides, consider the set of the heroes not chosen to take part in the Justice League. For any two heroes on that set, they must not have a relationship. This prevents the formation of unofficial justice leagues.

You work for an agency in charge of creating the new Justice League. The agency doesn't know if it is possible to create the League with the restrictions given, and asked for your programming skills. Given a set of super heroes and their relationships, determine if it is possible to select any subset to form the Justice League, according to the given restrictions.

Input

The input is composed of several test cases. The first line of each test case contains two integers separated by a single space, H ($2 \leq H \leq 5 \times 10^4$) and R ($1 \leq R \leq 10^5$), indicating, respectively, the number of heroes and the number of relationships. Each of the following R lines contains two integers separated by a single space, A and B ($1 \leq A < B \leq H$), indicating that superhero A has a relationship with super hero B . Note that if A has a relationship with B , B also has a relationship with A . A relationship is never informed twice on a test case. The end of input is indicated by $H = R = 0$. The input must be read from standard input.

Output

For each test case in the input print a single line, containing the uppercase letter "Y" if it is possible to select a subset of heroes to form the Justice League according to the given restrictions, or the uppercase letter "N" otherwise. The output must be written to standard output.

Sample input

```
5 5
1 2
```

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2 3
1 3
1 4
3 5
9 8
1 2
2 3
3 4
4 5
5 6
6 7
7 8
8 9
4 3
1 2
2 3
3 4
0 0

Sample output

Y
N
Y

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Problem F. Milk

In Russia, the Value Added Tax is 18% for almost all goods, with the exception of certain food items, which have a Value Added Tax of only 10%. You are given a String product, the name of a product, and an int price, the price of the product before tax. You are also given a String[] food, each element of which is the name of a food product. If the given product is an element in food, it is a food item (and thus subject to 10% tax), and otherwise, it is a non-food item (and thus subject to 18% tax). Return the price of the product after tax has been added.

Notes: The returned value must have an absolute or relative error less than $1e-9$.

Constraints:

- product will contain between 1 and 50 characters, inclusive;
- each character in product will be a lowercase letter ('a'-'z');
- price will be between 1 and 1000, inclusive;
- food will contain between 1 and 50 elements, inclusive;
- each element of food will contain between 1 and 50 characters, inclusive;
- each character in each element of food will be a lowercase letter ('a'-'z');
- all elements of food will be distinct.

Examples

0) "milk", 1
{ "bread", "butter", "milk" }
Returns: 1.1

1) "car", 100
{ "bread", "butter", "milk" }
Returns: 118.0

2) "abc", 57
{ "a", "b", "c" }
Returns: 67.25999999999999

Source: TopCoder

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Problem G. Points

Given n points, you must find the number of possibilities of choosing three of these points such that the area of the triangle determined by these three points be an integer.

Input

The input file contains on the first line the number of points (n). Each of the next n lines contains two integers, separated by blank characters, representing the coordinates of a point.

Output

The output file must contain a single number representing the number of possibilities of choosing three of the points such that the area of the triangle determined by these three points be an integer.

Restrictions

$3 \leq n \leq 10000$;

the coordinates of the points are integers between 0 and 1000;

the area of a triangle determined by three colinear points is 0;

there are no two points having the same coordinates.

Example

points.in

4

0 0

0 2

2 2

2 0

points.out

4

Source: Agora Programming Contest 2003/2004 – Round #22

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Problem H. Sequence

Let A_n – be the number of sequences containing “0” and “1”, such that each of them do not contain subsequence equal “0101”. For the given number N ($N \leq 10^7$) find the parity of A_n .

Input	Output
1	2
2	4