

UAP Practice Programming Contest

<https://toph.co/contests/training/6whf2ve>



Schedule

The contest will run for **2h30m0s**.

Authors

The author of this contest is shohagfaraji.

Rules

This contest is formatted as per the official rules of ICPC Regional Programming Contests.

You can use Bash 5.0, Brainf*ck, C# Mono 6.0, C++11 GCC 7.4, C++14 GCC 8.3, C++17 GCC 9.2, C++20 Clang 16.0, C++20 GCC 12.1, C11 GCC 12.1, C11 GCC 9.2, Common Lisp SBCL 2.0, D8 11.8, Erlang 22.3, Free Pascal 3.0, Go 1.18, Grep 3.7, Haskell 8.6, Java 1.8, Kotlin 1.1, Lua 5.4, Node.js 10.16, Perl 5.30, PHP 7.2, PyPy 7.1 (2.7), PyPy 7.1 (3.6), Python 2.7, Python 3.11, Python 3.7, Ruby 2.7, Ruby 3.2, Rust 1.57, Swift 5.3, and Whitespace in this contest.

Be fair, be honest. Plagiarism will result in disqualification. Judges' decisions will be final.

Notes

There are 6 challenges in this contest.

Please make sure this booklet contains all of the pages.

If you find any discrepancies between the printed copy and the problem statements in Toph Arena, please rely on the later.

Disclaimer

The contents of this contest have not been reviewed by Toph and do not necessarily represent Toph's views.

A. Hello coder!

Limits 500ms, 256 MB



Input

There is no input.

Output

Print "I Love Coding".

Samples

<u>Input</u>	<u>Output</u>
	I Love Coding

B. Are You Fine?

Limits 1s, 256 MB

Arpita is really good in problem solving and maths. But not always because she is always in a hurry to solve a problem as fast as possible and then she makes the mistake.

Recently she got her exam marks of Probability & Statistics. She obtained M out of N . What is the probability of getting M out of N marks?

Input

Input contains two numbers, M ($0 \leq M \leq N$) and N ($1 \leq N \leq 100$)

Output

Print the answer in P/Q format.

Samples

<u>Input</u>	<u>Output</u>
1 100	1/101
Explanation: Probability to get 1 out of 100 is 1/101	
<u>Input</u>	<u>Output</u>
50 50	1/51

C. Love Plus, Hate Minus

Limits 1s, 512 MB

Given a number of N numerical digits. Make it maximum as a Number by rearranging its digits.

Numerical digits are 0, 1, 2, 3, 4, 5, 6, 7, 8, 9

Input

The first line contains the number of test cases T ($1 \leq T \leq 100$).

Each testcase contains a Value ($-10^{500} \leq \text{Value} \leq 10^{500}$) of N ($1 \leq N \leq 501$) numerical digits.

Output

Print the only maximum value you can obtain from the input.

Samples

<u>Input</u>	<u>Output</u>
5 22112000 05072001 19191919 2120110121201131160620220708202322 -2120110121201131160620220708202322	22211000 75210000 99991111 876633222222222211111111100000000 -000000001111111122222222222336678
Explanation: In the first testcase, 22211000 is the maximum value we could get. In the fifth testcase, all the smaller digits placed earlier than the greater digits as the given number was negative.	

D. Warrior's Shield

Limits 1s, 512 MB

Hundred of years ago warriors used to fight with sword and shield. They used to make the shield so strong to dodge enemy attacks. Now you have to make a shield as per the commander's order.

An odd number **N** will be given indicating the number of Rows. (Rows = N and Columns = 2 * N)

Make the following shield to dodge enemy attacks.

Condition: To make the shield you can use only "." and "*".

Input

An **odd number** will be given **N** ($9 \leq N \leq 51$), indicating the number of Rows.

Output

Print the shield by following the condition.

Samples

<u>Input</u>	<u>Output</u>
9	<pre>. * * * . . . * . . . * * * . . . * * . . . * * . . . * * * . . . * . * * * * * * * * * * . * . . . * * * . . . * . . . * . . . * * * * . . . * * . . . * * * * * *</pre>
<u>Input</u>	<u>Output</u>
15	<pre>. * * * . . . * * * * * * . . . * . . . * . . . * * * . . . * . . . * * * * . . . * . . . * * . .</pre>

[illegible]

E. I want Long Long salary

Limits 1s, 512 MB

Kakashi recently got a job with initial salary M . His N friends also got jobs in the same company but with different salaries. By excitement he asked all his N friends salaries ($s_1, s_2, s_3, \dots, s_N$) and wrote them on a paper serially. All the salaries were distinct, that means for any value i and j ($1 \leq i, j \leq N$ & $i \neq j$) this condition ($s[i] \neq s[j]$) satisfies. The reason for that they all took job in the same company is, the company increases salaries every month by summing up employee's initial salary.

For an example if Kakashi's initial salary is 2,

after 1 month it would be $2 + 2 = 4$

after 2 month $4 + 2 = 6$

.....

after M th month $2 * M + 2 = 2M + 2$

Kakashi wonders as all of his friends salaries are different, what is the **minimum** months (can be zero) he have to wait when all of his friends salaries along with him will be same. **It is guaranteed that it wouldn't be a same month for any of them.** Example: Suppose Kakashi has initial salary 3 and his two friends with initial salary $s[] = \{2, 4\}$. Next 6 months their salaries will be like this-

	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6
3	6	9	12	15	18	21
2	4	6	8	10	12	14
4	8	12	16	20	24	28

After **3 months** Kakashi will have salary **12**.

His friend with initial salary 2, after **5 months** will have salary **12**.

His another friend with initial salary 4, after **2 months** will have salary **12**.

As you see (3, 5, 2) are different months. Which satisfied the condition— *"It is guaranteed that it wouldn't be a same month for any of them"*. And here 3 is the minimum possible month Kakashi have to wait.

Input

The first line contains the number of test cases T ($1 \leq T \leq 100$). The description of the test cases follows.

The first line of each test case contains two integers N ($1 \leq N \leq 10^5$) and M ($1 \leq M \leq 10^8$) — indicating number of friends and initial salary of Kakashi.

The second line of each test case contains N integers $s_1, s_2, s_3, \dots, s_N$ ($1 \leq s[i] \leq 10^8$). All $s[i]$ are pairwise distinct.

It is guaranteed that the sum of all test cases do not exceed 20^5 .

Output

Print the minimum possible month that Kakashi have to wait to reach the salary.

It is guaranteed that a minimum answer always exists.

Samples

<u>Input</u>	<u>Output</u>
5 2 3 2 4 4 3 2 4 5 6 1 5 1 7 6 3 1 2 4 12 5 8 2 777777 8888888 99999999	3 19 0 19 799999991
Explanations: First testcase is already explained in the statement.	

<u>Input</u>	<u>Output</u>																												
<p>Second testcase, among all the possible answers, two possible salaries where their salaries would match are 180, 60. Kakashi have to wait at least 19 months to reach 60 salary. So 19 is the minimum possible answer.</p>																													
<p>Third testcase, Kakashi is already on the salary 5 where his only friend with initial salary 1 have to wait 4 months. Note, here Kakashi didn't have to wait (so the answer is 0) rather his friend waited 4 months and reached on salary 5.</p>																													
<table><tr><th></th><th>Month</th><th>Month</th><th>Month</th><th>Month</th><th>Month</th><th>Month</th></tr><tr><th></th><th>1</th><th>2</th><th>3</th><th>4</th><th>5</th><th>6</th></tr><tr><th>5</th><td>10</td><td>15</td><td>20</td><td>25</td><td>30</td><td>35</td></tr><tr><th>1</th><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr></table>			Month	Month	Month	Month	Month	Month		1	2	3	4	5	6	5	10	15	20	25	30	35	1	2	3	4	5	6	7
	Month	Month	Month	Month	Month	Month																							
	1	2	3	4	5	6																							
5	10	15	20	25	30	35																							
1	2	3	4	5	6	7																							
<p>Forth testcase, three minimum possible answers are 39, 19, 59.</p>																													
<p>As 19 is here the minimum so Kakashi will wait only 19 months.</p>																													

<u>Input</u>	<u>Output</u>
5 2 55555 77777 33333 3 888888 33333 555555 88888 4 222222 111111 6666666 5555 888 5 6666666 3333333 7777777 444444 88888 222222 6 9999999 88888888 55555555 4444444 2222222 1111111 777777	20 55554 2244444219 2465723 164638457048
This is the testcase 6.	

F. Necklace of Love ♥

Limits 2s, 512 MB



Hodaka and Hina lives in a small house in a jungle. Hodaka loves to surprise Hina with small gifts like flowers and fruits. But Today is more special for Hodaka because today is Hina's birthday. He wants to surprise her with something different today. So he decided to make a necklace for her using flowers. Hodaka collected V number of flowers ($F_1, F_2, F_3, \dots, F_v$) and made a necklace by joining them with one another (E means the edges/connections between flowers). But he is confused weather he successfully made it or not. He is asking you to help him by saying YES or NO.

Successful necklace: There must be one or more than one circle to put on neck. To understand better check the examples below.

Input

First line of the input contains V ($3 \leq V \leq 100$) and E [$(V - 1) \leq E \leq (V * (V - 1)) / 2$]

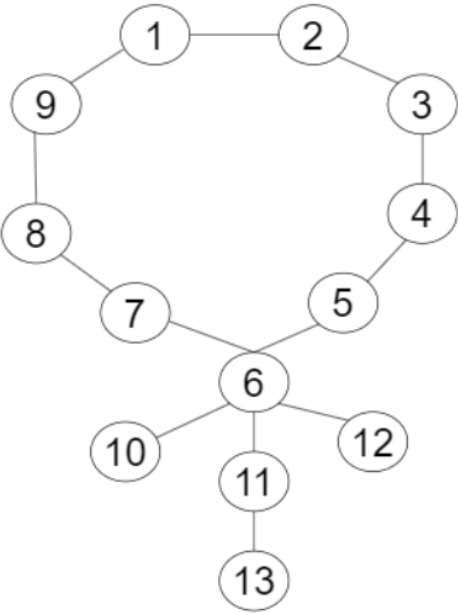
Next E lines contains two numbers X, Y indicating the edges between flower X with flower Y .

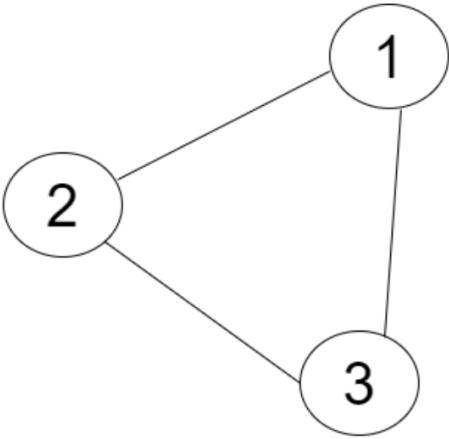
- There are no self loops in nodes
- Any two connected nodes have only one edge
- All the connected node pairs are unique

Output

Print YES if he made a necklace successfully otherwise NO.

Samples

<u>Input</u>	<u>Output</u>
13 13 1 2 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 1 6 10 6 11 6 12 11 13	YES
	
<u>Input</u>	<u>Output</u>
3 3 1 2 2 3 3 1	YES

<u>Input</u>	<u>Output</u>
 <p>There is a circle so Hina can put on her neck.</p>	

<u>Input</u>	<u>Output</u>
13 12 2 3 3 4 4 5 5 6 6 7 7 8 8 9 9 1 6 10 6 11 6 12 11 13	NO

<u>Input</u>	<u>Output</u>
<div data-bbox="565 310 1003 898" data-label="Diagram"> <pre> graph TD 1 --- 9 9 --- 8 8 --- 7 7 --- 6 6 --- 5 5 --- 4 4 --- 3 3 --- 2 6 --- 10 6 --- 11 6 --- 12 11 --- 13 10 --- </pre> </div> <p data-bbox="203 947 1474 1031">Flower 1 and 2 are not connected. Even there are not a single circle from where Hina could put her neck.</p> <p data-bbox="203 1066 1078 1102">If flower 7 and 10 were connected she could wear the necklace.</p>	