Forest Fire problem

Roco is an island near Africa which is very prone to forest fire. Forest fire is such that it destroys the complete forest. Not a single tree is left.This island has been cursed by God , and the curse is that whenever a tree catches fire, it passes the fire to all its adjacent tree in all 8 directions,North, South, East, West, North-East, North-West, South-East, and South-West.And it is given that the fire is spreading every minute in the given manner, i.e every tree is passing fire to its adjacent tree.Suppose that the forest layout is as follows where T denotes tree and W denotes water.

Your task is that given the location of the first tree that catches fire, determine how long would it take for the entire forest to be on fire. You may assume that the lay out of the forest is such that the whole forest will catch fire for sure and that there will be at least one tree in the forest

Input Format:

- First line contains two integers, M, N, space separated, giving the size of the forest in terms of the number of rows and columns respectively.
- The next line contains two integers X,Y, space separated, giving the coordinates of the first tree that catches the fire.
- The next M lines, where ith line containing N characters each of which is either T or W, giving the position of the Tree and Water in the ith row of the forest.

Output Format:

Single integer indicating the number of minutes taken for the entire forest to catch fire

Constrains:

- $3 \leq M \leq 20$
- $3 \leq N \leq 20$

Sample Input 1:

3 3
W T T
T W W
W T T

Sample Output 1:

5

Explanation:
In the second minute,tree at (1,2) catches fire,in the third minute,the tree at (2,1) catches fire,fourth minute tree at (3,2) catches fire and in the fifth minute the last tree at (3,3) catches fire.

Critical Planet Problem

War between Republic and Separatist is escalating. The Separatist are on a new offensive. They have started blocking the path between the republic planets (represented by integers), so that these planets surrender due to the shortage of food and supplies. The Jedi council has taken a note of the situation and they have assigned Jedi Knight Skywalker and his Padawan Ahsoka to save the critical planets from blockade (Those planets or system of planets which can be accessed by only one path and may be lost if that path is blocked by separatist).

Skywalker is preparing with the clone army to defend the critical paths. He has assigned Ahsoka to find the critical planets. Help Ahsoka to find the critical planets(C) in ascending order. You only need to specify those planets which have only one path between them and they cannot be accessed by any other alternative path if the only path is compromised.

Constraints

- M <= 10000
- N <= 7000

Input

- First line contains two space separated integers M and N, where M denotes the number of paths between planets and N denotes the number of planets.
- Next M lines, each contains two space separated integers, representing the planet numbers that have a path between them.

Output

C lines containing one integer representing the critical planet that they need to save in ascending order of the planet number if no planet is critical then print -1

Time Limit

1

Examples

Example 1

Input

3 4

0 1

1 2

2 3

Output

0

1

2

3

Explanation

Since all the planets are connected with one path and cannot be accessed by any alternative paths hence all the planets are critical.

Bank Compare Problem

Question – : There are two banks – Bank A and Bank B. Their interest rates vary. You have received offers from both banks in terms of the annual rate of interest, tenure, and variations of the rate of interest over the entire tenure.You have to choose the offer which costs you least interest and reject the other. Do the computation and make a wise choice.

The loan repayment happens at a monthly frequency and Equated Monthly Installment (EMI) is calculated using the formula given below :

EMI = loanAmount * monthlyInterestRate / (1 – 1 / (1 + monthlyInterestRate)^(numberOfYears * 12))

Constraints:

- 1 <= P <= 1000000
- 1 <=T <= 50
- 1<= N1 <= 30
- 1<= N2 <= 30

Input Format:

- First line: P principal (Loan Amount)
- Second line: T Total Tenure (in years).
- Third Line: N1 is the number of slabs of interest rates for a given period by Bank A. First slab starts from the first year and the second slab starts from the end of the first slab and so on.
- Next N1 line will contain the interest rate and their period.
- After N1 lines we will receive N2 viz. the number of slabs offered by the second bank.
- Next N2 lines are the number of slabs of interest rates for a given period by Bank B. The first slab starts from the first year and the second slab starts from the end of the first slab and so on.
- The period and rate will be delimited by single white space.

Output Format: Your decision either Bank A or Bank B.

Explanation:

- **Example 1**
  - Input
  - 10000
  - 20
  - 3
  - 5 9.5
  - 10 9.6
  - 5 8.5
  - 3
  - 10 6.9
  - 5 8.5
  - 5 7.9
- **Output**: Bank B

Collecting Candies

Question:- Krishna loves candies a lot, so whenever he gets them, he stores them so that he can eat them later whenever he wants to.

He has recently received N boxes of candies each containing Ci candies where Ci represents the total number of candies in the ith box. Krishna wants to store them in a single box. The only constraint is that he can choose any two boxes and store their joint contents in an empty box only. Assume that there are an infinite number of empty boxes available.

At a time he can pick up any two boxes for transferring and if both the boxes contain X and Y number of candies respectively, then it takes him exactly X+Y seconds of time. As he is too eager to collect all of them he has approached you to tell him the minimum time in which all the candies can be collected.

Input Format:

- The first line of input is the number of test case T
- Each test case is comprised of two inputs
- The first input of a test case is the number of boxes N
- The second input is N integers delimited by whitespace denoting the number of candies in each box

Output Format: Print minimum time required, in seconds, for each of the test cases. Print each output on a new line.

Constraints:

- 1 < T < 10
- 1 < N< 10000
- 1 < [Candies in each box] < 100009

Input

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

Output

19

Dining Table Seating Arrangement Problem

In a Conference ,attendees are invited for a dinner after the conference.The Co-ordinator,Sagar arranged around round tables for dinner and want to have an impactful seating experience for the attendees.Before finalizing the seating arrangement,he wants to analyze all the possible arrangements.These are R round tables and N attendees.In case where N is an exact multiple of R,the number of attendees must be exactly N//R,,If N is not an exact multiple of R, then the

distribution of attendees must be as equal as possible.Please refer to the example section before for better understanding.
For example, R = 2 and N = 3
All possible seating arrangements are
(1,2) & (3)
(1,3) & (2)
(2,3) & (1)
Attendees are numbered from 1 to N.

Input Format:

- The first line contains T denoting the number of test cases.
- Each test case contains two space separated integers R and N, Where R denotes the number of round tables and N denotes the number of attendees.

Output Format:

Single Integer S denoting the number of possible unique arrangements.

Constraints:

- 0 <= R <= 10(Integer)
- 0 < N <= 20 (Integer)

Sample Input 1:
1
2 5
Sample Output 1:
10

Explanation:
R = 2, N = 5

(1,2,3) & (4,5)

(1,2,4) & (3,5)

(1,2,5) & (3,4)

(1,3,4) & (2,5)

(1,3,5) & (2,4)

(1,4,5) & (2,3)

(2,3,4) & (1,5)

(2,3,5) & (1,4)

(2,4,5) & (1,3)

(3,4,5) & (1,2)

Arrangements like

(1,2,3) & (4,5)

(2,1,3) & (4,5)

(2,3,1) & (4,5) etc.

But as it is a round table,all the above arrangements are same.

Count Pairs Problem

Given an array of integers A, and an integer K find number of happy elements.

Element X is happy if there exists at least 1 element whose difference is less than K i.e. an element X is happy if there is another element in the range [X-K, X+K] other than X itself.

Constraints

- 1 <= N <= 10^5
- 0 <= K <= 10^5
- 0 <= A[i] <= 10^9

Input

- First line contains two integers N and K where N is size of the array and K is a number as described above.
- Second line contains N integers separated by space.

Output

- Print a single integer denoting the total number of happy elements.

Example 1

Input

6 3

5 5 7 9 15 2

Output

5

Explanation

Other than number 15, everyone has at least 1 element in the range [X-3, X+3]. Hence they are all happy elements. Since these five are in number, the output is 5.

Example 2

Input

3 2

1 3 5

Output

3

Explanation

All numbers have at least 1 element in the range [X-2, X+2]. Hence they are all happy elements. Since these three are in number, the output is 3.

Possible Solution

Input:

3 2

1 3 5

Dole Out Cadbury

You are a teacher in reputed school. During Celebration Day you were assigned a task to distribute Cadbury such that maximum children get the chocolate. You have a box full of Cadbury with different width and height. You can only distribute largest square shape Cadbury. So if you have a Cadbury of length 10 and width 5, then you need to break Cadbury in 5X5 square and distribute to first child and then remaining 5X5 to next in queue

Constraints

$0<P<Q<1501$

$0<R<S<1501$

Input Format

First line contains an integer P that denotes minimum length of Cadbury in the box

Second line contains an integer Q that denotes maximum length of Cadbury in the box

Third line contains an integer R that denotes minimum width of Cadbury in the box

Fourth line contains an integer S that denotes maximum width of Cadbury in the box

Output

Print total number of children who will get chocolate.

Explanation
Example 1

Input

5

7

3

4

Output

24

Explanation

Length is in between 5 to 7 and width is in between 3 to 4.

So we have 5X3,5X4,6X3,6X4,7X3,7X4 type of Cadbury in the box.

If we take 5X3 :

First, we can give 3X3 square Cadbury to 1st child .Then we are left with 3X2. Now largest square is 2X2 which will be given to next child. Next, we are left with two 1X1 part of Cadbury which will be given to another two children.

And so on