ONLINE EDITOR (B)

Minimum Queens

Problem Description

Imagine a chess board of size N x N where M Queens are placed on the chess board at different squares (i, j) where i is the row and j is the column. Pick a queen that can attack maximum other queens. If a queen is attacked it goes off the board. Minimize number of queens that remain on the board.

A Queen can move diagonally, horizontally and vertically.

A Queen can be moved only to attack another Queen and the path completes once this Queen cannot attack any other Queen on the board

Your aim is to print the minimum number of Queens that can remain on the board after choosing one path.

Constraints

3 <= N <= 50 1 <= M <= (N*N)

Input Format

First line contains two integers, N (size of board) and M (number of queens) delimited by comma (,)

Next M Lines, contain two integers and a string representing the coordinates of the position of queens and the name of the queen. For example 8,8,Q1, Here 8,8 is the position of Q1.

Refer diagrams in Example section for understanding the coordinate system of the board. Top left corner of the board is (1, 1) and bottom right is (N, N).

Output

One line containing minimum number of Queens that can remain on the board after all the possible attacks in one path are completed

Example 1

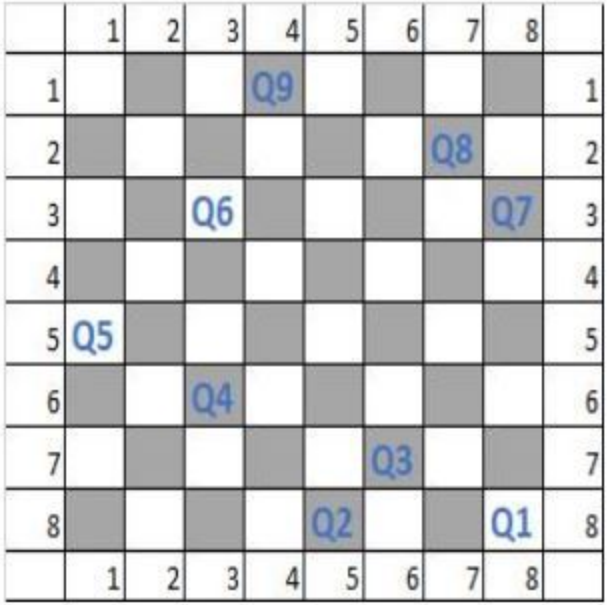
Input

8,9 8,8,Q1 8,5,Q2 7,6,Q3 6,3,Q4 5,1,Q5 3,3,Q6 3,8,Q7 2,7,Q8 1,4,Q9

Output

2

Explanation



There are total 9 Queens in the given scenario. **If you pick Q1,** It can kill 2 queens, if Path#1 (Q1 ==> Q6 ==> Q5) is followed It can kill 5 queens, if Path#2 (Q1 ==> Q7 ==> Q6 ==> Q4 ==> Q2 ==> Q3) is followed **If you pick Q3,** It can kill 7 queens, if Path#3 (Q3 ==> Q2 ==> Q1 ==> Q7 ==> Q8 ==> Q4 ==> Q6 ==> Q5) is followed Similarly, there can arise 'n' number of different paths if different Queens are chosen. The best path here is Path#3 that can kill 7 Queens & leaves only 2 queens on the board. So, 2 is the answer.

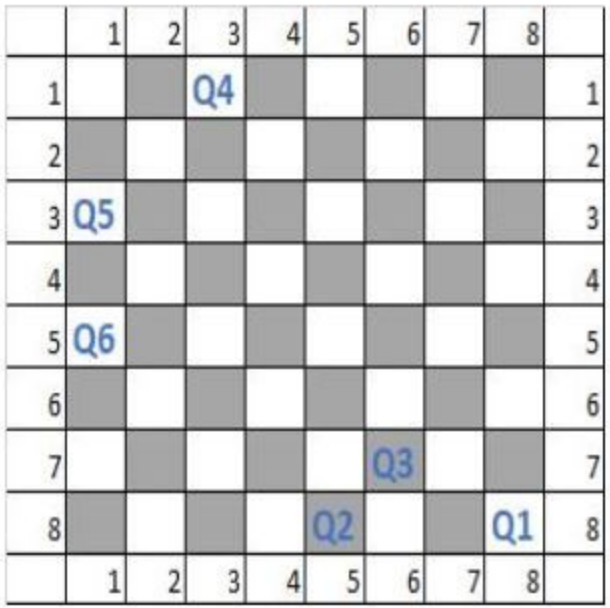
Input

8,6 8,8,Q1 8,5,Q2 7,6,Q3 5,1,Q6 3,1,Q5 1,3,Q4

Output

4

Explanation



Path#1 - Q1 -> Q2 -> Q3 Path#2 - Q4 -> Q5 -> Q6 But not both of them. After choosing either of the path, 1 + 3(from other path) remain on the table. So Answer here is 4.

ONLINE EDITOR (E)

Attendees Count

Problem Description

A Seminar is organised by XYZ company for it's employees. After the seminar, refreshments are served. There are three queues, one each for Juice, Cut fruits and Sandwich. Employees can go wherever they want and pick any snack item(s) in following fashion

· An employee can go for any snack any number of times as desired.

· S/he can move to another queue upon collecting snack from current queue (if s/he wants.)

For example, employee E, can first queue up for Sandwich and later queue up for Juice. After that E can queue up for sandwich again followed by cut fruits. If E is still hungry, then E can join any of the queues again.

Now, organisers want to ascertain that guests are well served. For this, they want to know the count of attendees, who have taken at least one snack in a particular interval of time. Now, there is no systematic way to do this, hence three different members of organizing team are watching the three different queues. Due to limitations of human memory, they are only able to watch sub-parts of the queue. They will collate their data and estimate the count of attendees who have taken at least one snack.

Their strategy is to randomly pick the lower and higher indices in each queue and memorize which guests were queued up in that sub-part. So for 3 queues, they would have 3 different observations. Note, that this is a mental exercise, hence their observations may collide on time. Simply put, the same employee may be seen in more than one queue, because their observations are not necessarily simultaneous.

Note : if an employee takes more than one snack then he/she will be counted as one.

Constraints

0 < N <= 5000 (Integer)

0 < Employee ID <= 5000 (Integer)

0 < R <= 100000 (Integer)

Input Format

First line contains an integer N, which denote the size of all 3 queues

Next three lines contain N space separated integers, which denote Employee IDs

Next line contains integer R, which denotes the number of queries

Next R lines containing 6 space separated integers L1,H1,L2,H2,L3,H3, where

L1 and H1 denote low and high indices of queue 1 i.e sub-part of queue 1

L2 and H2 denote low and high indices of queue 2 i.e sub-part of queue 2

L3 and H3 denote low and high indices of queue 3 i.e sub-part of queue 3

Output

For each query, print the employee count who has had at least one snack, on a new line

Test Case

Explanation

Example 1

Input

10

11 12 13 14 15 16 17 18 19 20

16 17 18 19 20 21 22 23 24 25

21 22 23 24 25 26 27 28 29 30

1

2 7 1 5 2 6

Output

14

Explanation

We can see that there is only one query. So we have to get 2nd to 7th employee from the first queue, which is 12 13 14 15 16 17. Similarly, 1st to 5th employee from the second queue, which is 16 17 18 19 20. Finally, 2nd to 6th from the third queue, which is 22 23 24 25 26.

So now the final list contain :

12 13 14 15 16 17 16 17 18 19 20 22 23 24 25 26

But we can see that employee with Employee ID 16 17 are coming twice in the list. So we count them only once so the final Employee count is 14.

Example 2

Input

7

1 2 3 4 5 6 7

6 6 2 1 5 2 1

2 5 4 3 1 8 3

2

1 5 3 5 2 4

1 3 5 6 3 7

Output

Output

5

6

Explanation

For 1st query 1 5 3 5 2 4

For the first query we have to get 1st to 5th employee from the first queue, which is 1 2 3 4 5. Similarly, 3rd to 5th employee from the second queue, which is 2 1 5. Finally, 2nd to 4th from the third queue, which is 5 4 3.

So now the final list contain :

1 2 3 4 5 2 1 5 5 4 3

But we can see that employee with Employee ID 1 2 3 4 5 are coming twice in the list. So we count them only once so the final Employee count is 5.

Similarly For 2nd record 1 3 5 6 3 7 output will be 6.

ONLINE EDITOR (C)

Roads Required

Problem Description

President Chew Barka rules over puppy Land. Elections are near, and he has not done much. The President wants to be reelected again.

He knows some states where he most definitely will lose. He needs to do something for these people. A state is a group of cities, which is connected with any other city. Now, commutation is a serious problem for citizens, and there is only one road for transportation between any two cities in a state. He knows if he connects all cities with each other in a state by roads, the citizens of state will be very happy and vote him again.

He sends Sherlock Bones to figure out how many roads they have to build in every state for gaining the trust of the people. Help Sherlock Bones to find out the count of required roads.

Constraints

N <= 10 ^ 5

M <= N(N−1)/2

Input Format

N: Number of Cities in the country

M : Number of roads connecting various cities

u, v : Roads from city u to v

Output

Number of roads required to be laid, to win all states

— Test Case

— Explanation

Example 1

7 5

1 2

1 3

2 4

5 6

5 7

Output

4

Explanation

There are 7 cities and 5 roads. Cities 1,2,3,4 form one state and cities 5,6,7 forms another state, thus there are 2 states. State 1 is connected by 3 roads. State 2 is connected by 2 roads. State 1 requires 3 more roads and State 2 requires 1 more road so that all the cities in the state are connected.

ONLINE EDITOR (D)

User Id

Problem Description

A person, new to his job in a start-up, was given a task by his supervisor to prepare a report where the user IDs (of all the employees) is a part of the report. He fetched the user IDs from database and then used a spreadsheet function to concatenate them to share it in email as text. However, while concatenating, he forgot to put a comma (,) in between the two user IDs.

As a rule, user IDs of the portal should be minimum 4 characters and can only contain alphabets and cannot start or end with a vowel. Supervisor knows about this rule and the number of employees in the department. Therefore, he tries to guess a possible set of user IDs from the given string (of user IDs in the email). You need to find the total no. of different set of user Ids that are possible given the number of employees in the department and the string of user IDs.

Constraints

1<Number of Employees<10

7<Length of user id string <51

Input Format

First Line contains an integer, which provides the Number of Employees in the organization

Second Line contains a string of concatenated user ids

Output

Number of possibilities of user ID sets.

Explanation

Example 1

Input

2

nonajklop

Output

1

Explanation

Since supervisor knows there are only 2 user IDs and they cannot start or end with a vowel, there is only one possibility - 'nonaj' and 'klop' so there is only one probability of the user ID sets.

Example 2

Input

3

poppolfgopjduhqertol

Output

6

Explanation

Since supervisor knows there are only 3 user IDs and they cannot start or end with a vowel, there are following possibilities -

poppol fgop jduhqertol

poppol fgopj duhqertol

poppol fgopjduh qertol

poppolf gopjduh qertol

poppolf gopj duhqertol

poppolfgop jduh qertol

Since there are six possibilities

ONLINE EDITOR (F)

Cross Words

Problem Description

A crossword puzzle is a square grid with black and blank squares, containing clue numbers (according to a set of rules) on some of the squares. The puzzle is solved by obtaining the solutions to a set of clues corresponding to the clue numbers.

The solved puzzle has one letter in each of the blank square, which represent a sequence of letters (consisting of one or more words in English or occasionally other languages) running along the rows (called "Across", or "A") or along the columns (called "Down" or "D"). Each numbered square is the beginning of an Across solution or a Down solution. Some of the across and down solutions will intersect at a blank square, and if the solutions are consistent, both of them will have the same letter at the intersecting square.

In this problem, you will be given the specifications of the grid, and the solutions in some random order. The problem is to number the grid appropriately, and associate the answers consistently with the clue numbers on the grid, both as Across solutions and as Down solutions, so that the intersecting blank squares have the same letter in both solutions.

Rules for Clue Numbering

The clue numbers are given sequentially going row wise (Row 1 first, and then row2 and so on)

Only blank squares are given a clue number

A blank square is given a clue number if either of the following conditions exist (only one number is given even if both the conditions are satisfied)

It has a blank square to its right, and it has no blank square to its left (it has a black square to its left, or it is in the first column). This is the beginning of an Across solution with that number

It has a blank square below it, and no blank square above it (it has a black square above it or it is in the first row). This is the beginning of a Down solution with that number

Constraints

5<=N<=15

5<=M<=50

Input Format

The input consists of two parts, the grid part and the solution part

The first line of the grid part consists of a number, N, the size of the grid (the overall grid is N x N) squares. The next N lines correspond to the N rows of the grid. Each line is comma separated, and has number of pairs of numbers, the first giving the position (column) of the beginning of a black square block, and the next giving the length of the block. If there are no black squares in a row, the pair "0,0" will be specified. For example, if a line contains "2,3,7,1,14,2", columns 2,3,4 (a block of 3 starting with 2), 7 (a block of 1 starting with 7) and 14,15 (a block of 2 starting with 14) are black in the corresponding row.

The solution part of the input appears after the grid part. The first line of the solution part contains M, the number of solutions. The M subsequent lines consist of a sequence of letters corresponding to a solution for one of the Across and Down clues. All solutions will be in upper case (Capital letters)

Output

The output is a set of M comma separated lines. Each line corresponds to a solution, and consists of three parts, the clue number, the letter A or D (corresponding to Across or Down) and the solution in to that clue (in upper case)

The output must be in increasing clue number order. Ifa clue number has both an Across and a Down solution, they must come in separate lines, with the Across solution coming before the Down solution.

Test Case

Explanation

Example 1

Input

5

5,1

1,1,3,1,5,1

0,0

1,1,3,1,5,1

1,1

5

EVEN

ACNE

CALVE

PLEAS

EVADE

Output

1,A,ACNE

2,D,CALVE

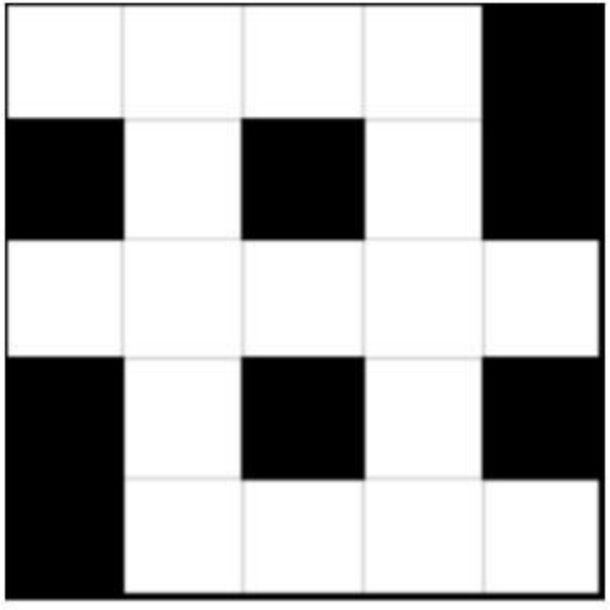
3,D,EVADE

4,A,PLEAS

5,A,EVEN

Explanation

N is 5, and the disposition of the black squares are given in the next 5 (N) lines. The grid looks like this



M=5, and there are 5 (M) solutions.

If the grid is numbered according to the rules, the numbered grid loos like this. Note that row 3 has no blanks, and the input line says “0,0”

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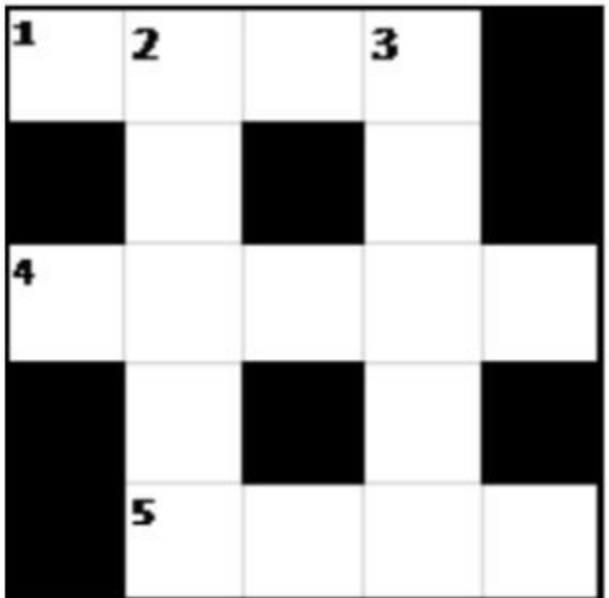
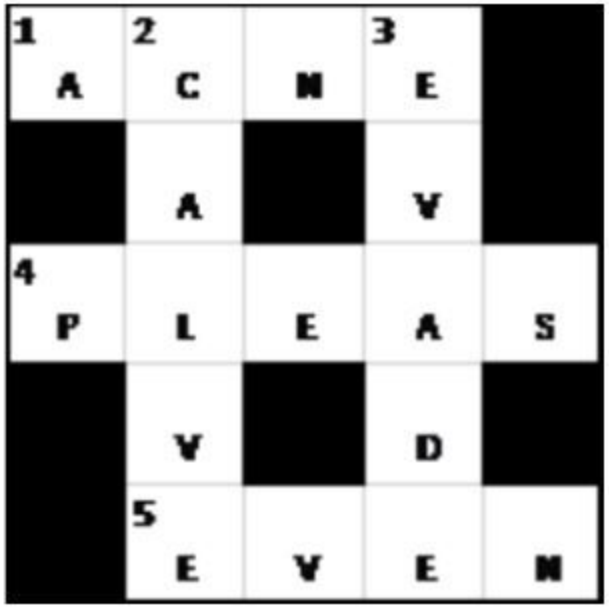


The solutions are fitted to the grid so that they are consistent, and the result is shown below. Note that this is consistent, because the letter at each intersecting blank square in the Across solution and the Down solution.



Based on this the output is given in clue number order. 1 Across is ACNE, and hence the first line of the output is 1,A,ACNE. The same logic gives all the remaining solutions.

Example 2

Input

5

1,1

1,1,3,2

0,0

1,1,3,2

0,0

5

ASIAN

RISEN

FEAR

CLAWS

FALLS

Output

1,A,FEAR

1,D,FALLS

2,D,RISEN

3,A,CLAWS

4,A,ASIAN

Explanation

N=5, and the grid looks like this

Explanation

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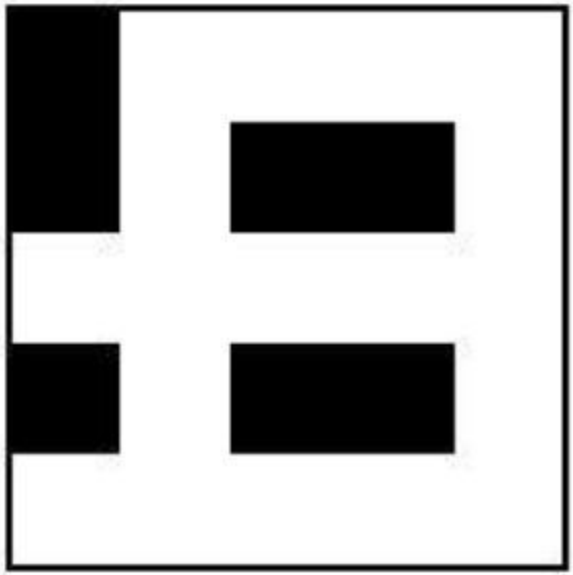

M=5, and the 5 solutions are given

The numbered grid looks like this