Coding Area

ONLINE EDITOR (A)

String Rotation

Problem Description

Rotate a given String in specified direction by specified magnitude.

After each rotation make a note of first character of the rotated String, After all rotation are performed the accumulated first character as noted previously will form another string, say **FIRSTCHARSTRING**.

Check If **FIRSTCHARSTRING** is an Anagram of any substring of the Original string.

If yes print "YES" otherwise "NO".

Constraints

1 <= Length of original string <= 30

1<= q <= 10

Input Format

The first line contains the original string s. The second line contains a single integer q. The ith of the next q lines contains character d[i] denoting direction and integer r[i] denoting the magnitude.

Output

YES or NO

Test Case

Explanation

Example 1

Input

carrace 3 L 2 R 2 L 3

Output

NO

Explanation After applying all the rotations the **FIRSTCHARSTRING** string will be "rcr" which is not anagram of any sub string of original string "carrace".

Upload Solution [Question : A]

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Coding Area

ONLINE EDITOR (B)

Number Sort Spell

Problem Description

Let's play the following game with two natural numbers (positive integers): Say, the two numbers are 5 and 6 and display them sorted as below in column A. We then spell the numbers and display them in column B. The spellings are then sorted and displayed in column C while column D displays the numerals corresponding to the sorted spellings:

Column A: Sorted numerals

Column B: Spelt numerals

Column C: Sorted Spelt numerals

Column D: Numerals corresponding to sorted spellings

Table 1:

A	B	C	D
5	Five	Five	5
6	Six	Six	6

Note that "Five" appears before "Six" in sorting order. Hence the numbers 5 and 6 are in the same order even when they are spelt!

Let's now generate two new numbers by adding up the corresponding numbers (in columns A and D) in the two rows in the table above: Table 2:

A	B	C	D
10	Ten	Ten	10
12	Twelve	Twelve	12

Again the spelt numbers appear in the sorted order corresponding to the numbers themselves. Proceeding in this fashion, we get the following tables: Table 3:

A	B	C	D
20	Twenty	Twenty	20
24	Twenty Four	Twenty Four	24

Table 4:

A	B	C	D
40	Forty	Forty	40
48	Forty Eight	Forty Eight	48

Table 5:

A	B	C	D
80	Eighty	Eighty	80
96	Ninety Six	Ninety Six	96

Table 6:

A	B	C	D
160	One Hundred Sixty	One Hundred Ninety Two	192
192	One Hundred Ninety Two	One Hundred Sixty	160

Table 7:

A	B	C	D
352	Three Hundred Fifty Two	Three Hundred Fifty Two	352
352	Three Hundred Fifty Two	Three Hundred Fifty Two	352

We observe that the two numbers 5 and 6 have "converged" to 352.

Here's another example with the two numbers being 100 and 50:

Table 1:

A	B	C	D
50	Fifty	Fifty	50
100	One Hundred	One Hundred	100

Table 2:

A	B	C	D
100	One Hundred	One Hundred	100
200	Two Hundred	Two Hundred	200

Table 3:

A	B	C	D
200	Two Hundred	Four Hundred	400
400	Four Hundred	Two Hundred	200

Table 4:

A	B	C	D
600	Six Hundred	Six Hundred	600
600	Six Hundred	Six Hundred	600

Thus 50 and 100 "converge" to 600. Note that the numbers converge when the spelled order breaks from the numeric order. Write a program to accept two natural numbers n1 and n2, perform the above calculations and output the "converged" number. The following are some example spellings of numbers - spell numbers in a similar fashion:

100: One Hundred

1729: One Thousand Seven Hundred Twenty Nine

99,999: Ninety Nine Thousand Nine Hundred Ninety Nine

output "Out of bounds" if any number exceeds 99,999 during calculations.

(Note: If the input numbers are the same, we would take the output to be that number itself.)

Constraints

N,M<=90000

Input Format

First Line contains two integers delimited by space <N M>

Output

Single line containing Converge number

"Out of bounds" if any number exceeds 99,999 during calculations.

Test Case

Explanation

Example 1: Input: 5 6 Output: 352

Example 2: Input: 1 1 Output: 1

Upload Solution [Question : B]

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Coding Area

ONLINE EDITOR (C)

Jurrasic Park

Problem Description

Smilodon is a ferocious animal which used to live during the Pleistocene epoch (2.5 mya–10,000 years ago). Scientists successfully created few smilodons in an experimental DNA research. A park is established and those smilodons are kept in a cage for visitors.

This park consists of Grasslands(G), Mountains(M) and Waterbodies(W) and it has three gates (situated in grasslands only).Below is a sample layout.

W	M	G	G	G	G
M	G	W	G	M	M
G	G	G	G	G	G
W	G	G	M	W	G

Before opening the park, club authority decides to calculate Safety index of the park. The procedure of the calculation is described below. Please help them to calculate.

Safety Index calculation

Assume a person stands on grassland(x) and a Smilodon escapes from the cage situated on grassland(y). If the person can escape from any of those three gates before the Smilodon able to catch him, then the grassland(x) is called safe else it is unsafe. A person and a Smilodon both takes 1 second to move from one area to another adjacent area(top, bottom, left or right) but a person can move only over grasslands though Smilodon can move over grasslands and mountains.

If any grassland is unreachable for Smilodon(maybe it is unreachable for any person also), to increase safe index value Club Authority use to mark those grasslands as safe land. Explained below

W	M	G	G	G	G
M	G	W	G(x)	M	M
G	W	G	G(y)	G	G
W	G(z)	W	M	W	G

For the above layout, there is only one gate at (4,6)

Y is the position of Smilodon's cage

X is not safe area

Z is a safe area as is it not possible for smilodon to reach z

Safety index=(total grassland areas which are safe*100)/total grassland area

Constraints

3<= R,C <= 10^3

Gates are situated on grasslands only and at the edge of the park

The cage is also situated in grassland only

The position of the cage and the position of three gates are different

Input Format

The first line of the input contains two space-separated integers R and C, denoting the size of the park (R*C)

The second line contains eight space-separated integers where

First two integers represent the position of the first gate

3rd and 4th integers represent the position of second gate

5th and 6th integers represent the position of third gate respectively

The last two integers represent the position of the cage

Next R lines, each contains space separated C number of characters. These R lines represent the park layout.

Output

Safety Index accurate up to two decimal places using Half-up Rounding method

Test Case

Explanation

Example 1

Input

4 4

1 1 2 1 3 1 1 3

G G G G

G W W M

G G W W

M G M M

Output

75.00

Explanation

G	G	G	G
G	W	W	M
G	G	W	W
M	G	M	M

Mountains	4
Gates- Safe Areas	3
Other Safe Areas	3
Waters	4
Cage Pos.-unsafe	1
Other unsafe areas	1

Safety Index= (6*100)/8

Example 2

Input

4 6

1 6 3 6 4 6 3 4

W M G G G G

M G W G M M

G W G G G G

W G W M W G

Output

69.23

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A B C D E F

ONLINE EDITOR (D)

Movie Sequence

Problem Description

We all like to watch movies in a theatre. Help the theatre owner to find out the sequence of movies he should play to get maximum profit.

Data provided is as follows

1. 4 Movie Names.

2. Movies have age (in years) restriction.

· 'A' grade : Age Limit : 24-50 (24 and 50 included)

· 'B' grade : Age Limit : 15-25 (15 and 25 included)

· 'C' grade : Age Limit : 3-18 (3 and 18 included)

· 'D' grade : Age Limit : 45-70 (45 and 70 included)

3. Profit of each movie ticket. Profit varies with movie.

4. There are 4 movie slots in a day, viz. { Morning, Afternoon, Evening, Night}

5. Age of all the audiences who would like to watch movie.

The theatre owner abides by following business intelligence rules accumulated over years through past experiences. These rules suggest the slots in which different categories of people will **not** be able to watch movie.

· People between age 3-20 (both included) will have school in the morning, so will not be able to attend morning show.

· People between age 21-40 (both included) will be at their jobs in the afternoon so will not be able to attend afternoon show.

· People between age 41-49 (both included) will not be able to watch movie in Evening show.

· People between age 50-70 (both included) will not be able to watch movie in Night show.

Given data and business intelligence rules, find the sequence of movie in respective slots so that theatre owner gets maximum profit with the constraint that one movie can be played only once in a day.

If there is only one movie sequence that earns the maximum profit then print the sequence and the maximum profit.

Ex. Movie1 Movie3 Movie4 Movie2 Maximum Profit: 110 If multiple movie sequences earn same amount of maximum profit, print the sequences in sorted order as per movie names provided in the *Input*. Also print maximum profit.

Movie sequences should be according to slots viz. {Morning Afternoon Evening Night} Ex. Movie1 Movie3 Movie2 Movie4 Movie1 Movie3 Movie4 Movie2 Movie1 Movie4 Movie2 Movie3 Movie2 Movie3 Movie4 Movie1 Movie3 Movie4 Movie2 Movie1 Maximum Profit: 110

Constraints

1. One movie can be played only once in a day.

2. Movies will not have space in them.

3. 0<=Age<=100.

Input Format

1. First line contains 4 names of movies delimited by space

2. Second Line contains grade of each movie corresponding to the order in first line

3. Third Line contains profit in rupees on each movie ticket

4. Fourth Line contains number of audiences.

5. Fifth Line contains age in years of all audiences. Age is always positive integer. Number of audiences will be between 1 and 30.

Output

1. The movie sequence to be played in respective slots to get maximum profit in such a way that one movie can be played only once.

2. Maximum Profit.

Test Case

Explanation

Example 1

Input

Movie1 Movie2 Movie3 Movie4
A B D C
10 20 15 5
11 23 43 6
7 1 0 45
4 6 7 24

Output

Movie1 Movie3 Movie2 Movie4
Movie1 Movie3 Movie4 Movie2
Movie1 Movie4 Movie2 Movie3
Movie2 Movie3 Movie4 Movie1
Movie3 Movie4 Movie2 Movie1
Maximum Profit: 110

Explanation

Decide the movie to be played in different slots such that theatre owner gets maximum profit and one movie can be played only once in a day.

1. Distribute the Audience to respective Movies as per grade age restrictions. Ex. Audience for Movie1: 23,43,45 (Movie1 is A graded with age restriction 24-50).

2. Decide which age group can watch movie in which slot based on age restriction. (Morning, Afternoon, Evening, Night) Ex. For Movie1. Morning slot: 24,43,45 Afternoon slot: 43,45 Evening slot: 24 Night slot: 43,24,45

3. Calculate the profit for each movie based on slot. For Movie1: Morning profit: 30 (3 audiences * 10 profit) Afternoon profit: 20 Evening profit: 10 Night Profit: 30

4. Perform same for all the 4 movies and decide the movie sequence to be played in respective slots to get maximum profit in such a way that one movie can be played only once.

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A B C D E F

ONLINE EDITOR (E)

Orchard

Problem Description

There is a large orchard containing apple trees that is coming up for sale. You want to bid for the same but you need to count the number of trees in the orchard so that you can arrive at a reasonable bid. The orchard is quite huge. While the boundaries are straight lines, the area covered by the orchard is a polygon. The polygon is simple (the sides will not intersect) but may not be convex (the interior angles may be more than 180 degrees) However, if you introduce a coordinate system inside the orchard, with the origin at a tree, all the trees are uniformly located at all points whose both coordinates are even integers. (Note that an integer is said to be even if the absolute value is even; hence -6 and 0 are even, -3 is not). The corner points of the boundaries are also at points whose coordinates are even integers. Given the coordinates of the corner points of the boundary, write a program to count the number of trees in the orchard.

Constraints

4 <=*N*<= 50

Input Format

The first line contains an integer N which gives the number of boundary corners.

The next N lines each contain two comma separated integers giving the coordinates of the boundary corners in clockwise order (so that the interior of the orchard is always on the right when going from one point to the next).

Output

One integer giving the number of trees in the orchard (including the trees on the boundary).

Test Case

Explanation

Example 1

Input

7

-4,-2

-4,2

-6,6

2,2

8,4

6,-4

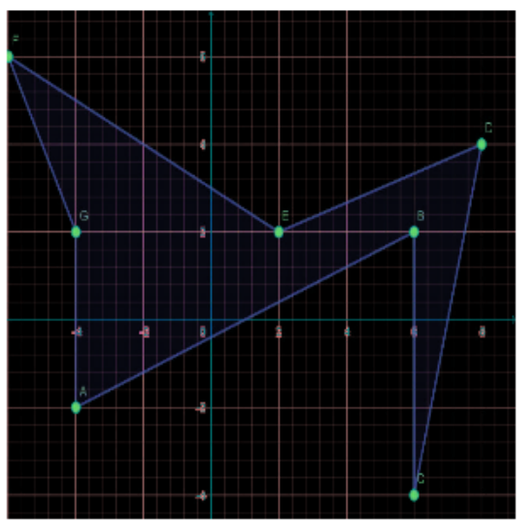
6,2

Output

17

Explanation

The polygon AGFEDCB is shown below. Trees are planted at points where the x and y coordinates are even, and the corner points are also even.



As can be seen, the number of trees on the boundary are 11, and the number of trees in the interior is 6, giving a total of 17 trees.

Example 2

Input

7

-2,-4

-4,-6

-6,4

0,0

6,6

8,-6

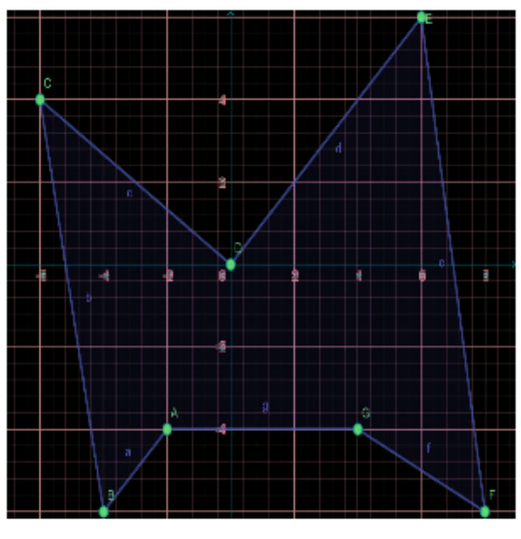
4,-4

Output

28

Explanation

The polygon ABCDEFG is shown below. The trees are on the corner points, and the boundary and interior points which have both x and y coordinates even.



There are 11 boundary trees and 17 interior trees. Hence the output is 28.

Upload Solution [Question : E]

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ONLINE EDITOR (F)

Vaccination

Problem Description

Bio-hazard has taken place in Wonderland. Different viruses have spread across different parts of the cities causing illness in humans and animals. The best biochemical researchers have gathered together to solve this problem. They have found out that there are different types of viruses spreading across regions and they have different density i.e. different levels of concentration. They need to figure out the area which is affected the most (has the highest total density of viruses), by the different kinds of viruses.

The manner in which viruses have spread in the Wonderland have mostly taken the form of triangles which have no obtuse angles. The researchers are tracking the same from another city which can be taken as origin (0, 0). Consider the area of infection (or effective region) of each virus as a 2D triangular area, with one edge of the triangle being on the X axis. The areas of infection of multiple viruses may overlap. In such a case, the density of viruses of the overlap area is the sum of the densities of each virus whose effective region overlaps this area.

The problem is to determine the area of the space which has maximum density of viruses, so that effective countermeasures (a vaccination campaign) can be taken depending on the size of the region.

For the ease of calculation, the researchers always choose the positive XY plane. Also they try to always keep the virus density to a whole number. In case there are more than one overlapping area with maximum density then the area closer to origin, will be treated as area of interest to start vaccination campaign from.

Help the Biochemists to find the area of the region where vaccination should be commenced.

Constraints

Xa, Xb, Xc, Yc > = 0

N >= 1

D = { 0, 1, 2, 3, ... }

Input Format

The first line contains the total number of triangles (N)

Each of the nest N lines contains 5 space delimited integers per line, where the

first value represents the distance of starting point from origin on X-axis (Xa),

second value represents the distant of ending point from origin on X-axis (Xb),

third and fourth point represents the point on XY plane (Xc, Yc),

and the last point is the density of viruses of the given triangle (D).

Output

The 2D area having the maximum density of viruses rounded to the nearest integer (using standard rounding rules).

Test Case

Explanation

Example 1

Input

2

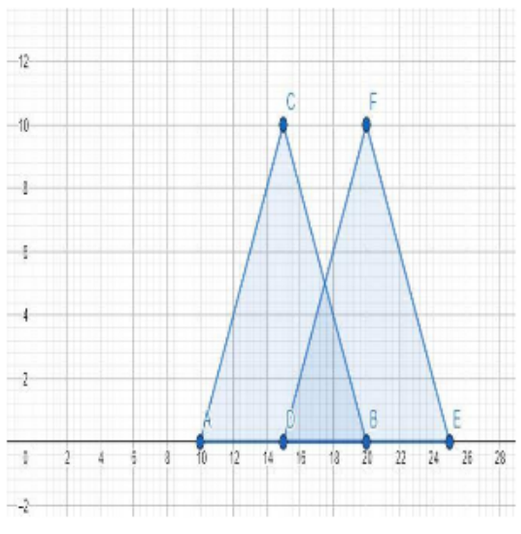
10 20 15 10 40

15 25 20 10 20

Output

13

Explanation



In this case, individually, the triangles have densities of 40 and 20 respectively. Hence the intersection will have overlapping density of 60 (40 + 20), which is the maximum. The maximum density is for the area within points D, B and the intersection between lines DF and BC. Hence, the area between these points (12.5) will be rounded to 13 and returned.

Example 2

Input

3

1 6 4 5 1

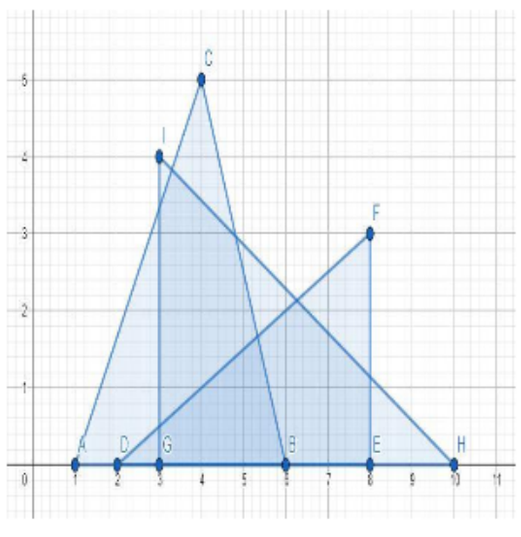
2 8 8 3 2

3 10 3 4 1

Output

3

Explanation



In this case, individually, the triangles have densities of 1, 2 and 1 respectively. Hence the intersection will have overlapping density of 4 (1 + 2 + 1), which is the maximum. The maximum density is for the area within points G, B and the intersection between lines DF& GI and DF&BC. Hence, the area between these points (approximately 3.083) will be rounded to 3 and returned.

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