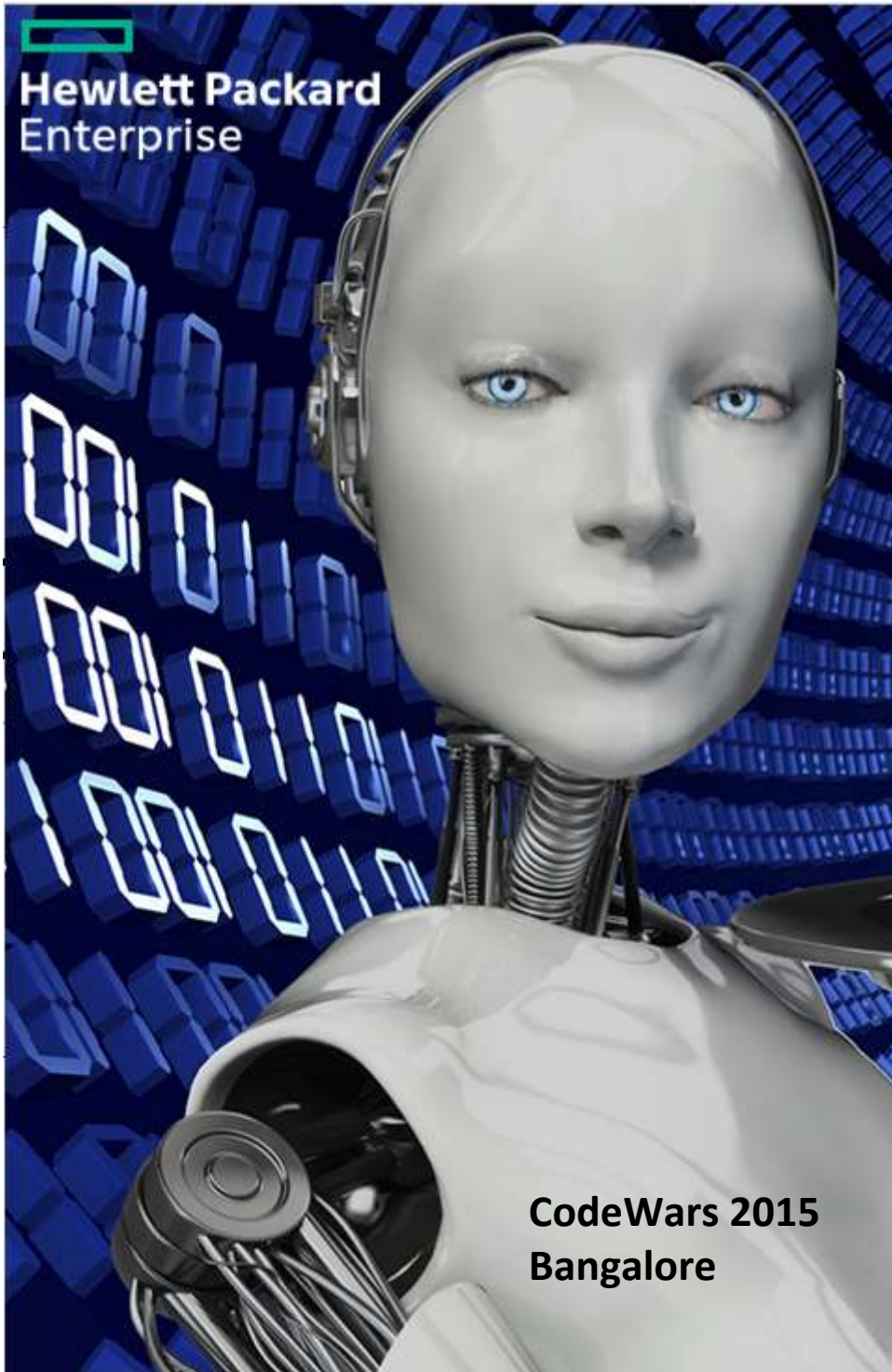**Hewlett Packard
Enterprise**

**CodeWars 2015
Bangalore**

Important Contest Instructions!!

Please read the following instructions carefully. They contain important information on how to package and submit your solutions to the judges. If you have any questions regarding these instructions, please ask a volunteer before the start of the contest.

Program Input/Output:

Programming tasks that require interaction with the program should prompt for user input on the screen (STDOUT) and read input from the keyboard (STDIN).

For non-interactive tasks, you will have two options for reading the input data. Using an input file named **probXX.txt** as an example, where 'XX' is the problem number.

First option, your solution may read the input from the file probXX.txt programmatically—that is, using the File I/O constructs of your programming language.

Second option is suitable for programs with large inputs by redirecting the contents of a file to your program at runtime. For example, a file named prob01.txt can be redirected to STDIN of your program using syntax like this:

```
%> java prob01 < prob01.txt
%> java –jar js.jar prob01.js < prob01.txt
%> python prob01.py < prob01.txt
%> prob01.exe < prob01.txt
```

In this example you are executing prob01 and sending the contents of the file prob01.txt to the STDIN of your program. Your program should behave exactly as it would if you were typing the input at the keyboard.

> *Tip: When entering input directly from the keyboard, type 'Ctrl-Z' <return> to signal the end of input to your program.*

All program output should always be sent to the screen (STDOUT).

Submitting your Programs

Interpreted Programs (JAVA, JavaScript, Python). Your program must be named probXX.java / probXX.js / probXX.py, where 'XX' corresponds to the problem number. Please submit only the source (.java, .js or .py). For java, the main class must be named probXX. Note the capitalization. All main and supporting classes should be in the default (or anonymous) package.

Native Programs (C. C++, etc). Your program should be named probXX.exe, where 'XX' corresponds to the problem number.

> You are strongly encouraged to submit Problem #0 (on the next page) prior to the start of the competition to ensure that your build environment is compatible with the judges'.

Preface

The purpose of this question is to ensure your program can be performed correctly in the judge's computer. Strongly advise to submit this question FIRST.

This is a variation of the classic program "Hello World!"

Please print out "`Hewlett Packard Enterprise – CodeWars 2015`".

Input

[No input in this problem.]

Output

`Hewlett Packard Enterprise – CodeWars 2015`

Question

An indoor swimming pool has to be filled with clean water. Given the dimensions of the swimming pool in meters, write a program to find the volume of water in cubic meters required to fully fill the swimming pool.

Volume = Length X Breadth X Depth

Input

Input should be three integers representing the Length, Breadth and Depth of the swimming pool respectively.

Output

Print the Volume.

Sample Input 1

```
50 20 10
```

Sample Output 1

```
10000
```

Question

Your cousin living in Houston, TX says it is 104^0 F. Your parents want to know the value in ^{0}C.

Write a program to convert Fahrenheit (F) to Celsius (C).

C = (5/9) X (F-32)

Input

Input should be an integer representing the temperature in Fahrenheit (F).

Output

Print corresponding temperature in Celsius (C).

Sample Input 1

104

Sample Output 1

40

Question

Write a program to find the difference between the square of the sums and the sum of the squares of the input numbers.

For example,

$Z = abs[(X1 + X2 + X3 + ….. + Xn)\wedge 2 - (X1\wedge 2 + X2\wedge 2 + X3\wedge 2 + …. + Xn\wedge 2)]$

Note: Program should be capable of handling any number of input values.

Input

First line of the input should take the number of integers and next line should take all the integer values separated by spaces.

Output

Print the resulting value as an integer.

Sample Input 1

```
5
5 10 2 25 20
```

Sample Output 1

```
2690
```

Sample Input 2

```
4
-8 0 10 12
```

Sample Output 2

```
112
```

Question

You and your team are going on a trekking trip to a mountain range. You have a mobile app that gives you a list of relative altitudes of the mountain range in the form of list, highlighting the altitude in meters above sea level. If you plot this list on a paper, the range will be seen as shown in the figure below (Figure: Mountain range). As a mountaineer, you need to carry a set of flags to mount on every peak. A peak is an element which is larger than its adjacent neighbors. You have to develop a software which lists out the altitude of each peak and the total number of flags that need to be carried along to mount one on each peak. The software should be capable of handling a large list of altitude measurements that the mobile app can supply for a given mountain range. If there are multiple consecutive peaks of the same value, flag will be mounted on the first occurrence.

Figure: Mountain Range
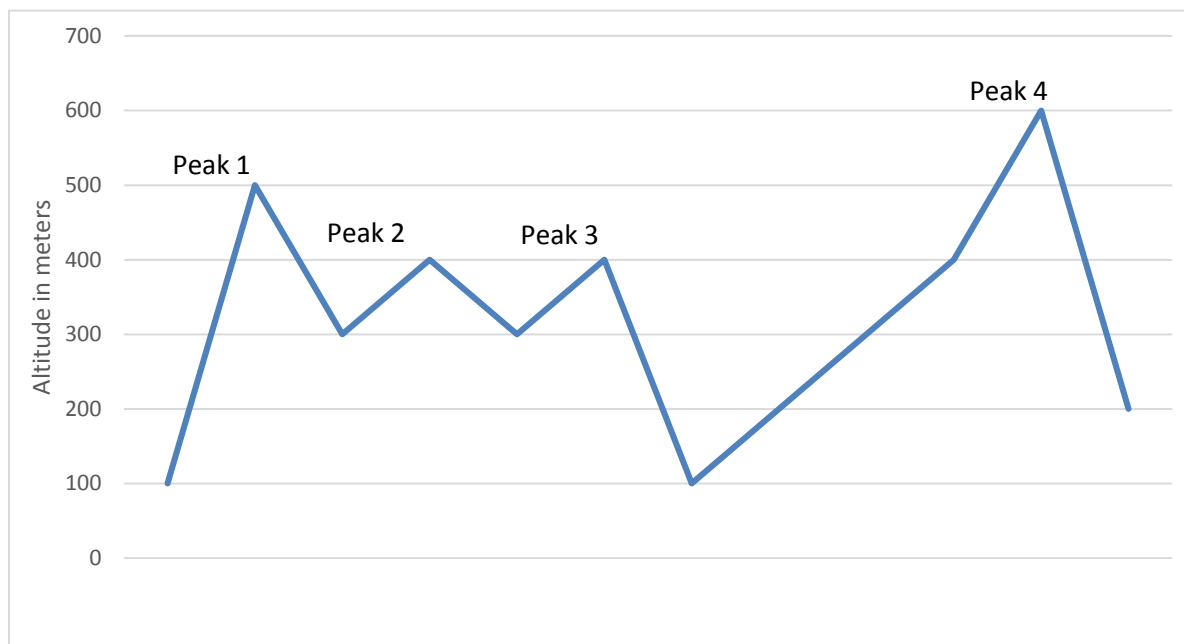
Input

The input should take the list of altitude measurements on a single line and each measurement is separated by a space.

Output

Print the output - first line will display the altitude of each of the peaks on a single line with a space separating each value. The second line will display the total number of flags to carry.

Sample Input 1

```
100 500 300 400 300 400 100 200 300 400 600 200
```

**Sample Output 1**

```
500 400 400 600
4
```

Question

A Pyramid is planned to be developed for a theme park and it's decided that the pyramid will be triangular in shape, i.e. it will have 3 triangles meeting at each vertex, having 4 Faces (3 faces plus the triangular floor making the 4th face), 4 Vertices and 6 Edges. A decision was taken to make the structure look regular, hence all edges of all 4 triangle faces were made equal in length. Can you help the builder to know the exact surface area of this triangular pyramid as he has to coat the wall and the floor with a special paint?

Further this structure has to be air cooled hence it's important to know the volume too of this triangular pyramid.

Refer below picture to get the view of the triangular pyramid for reference.

Triangular Pyramid

Front View

Top View
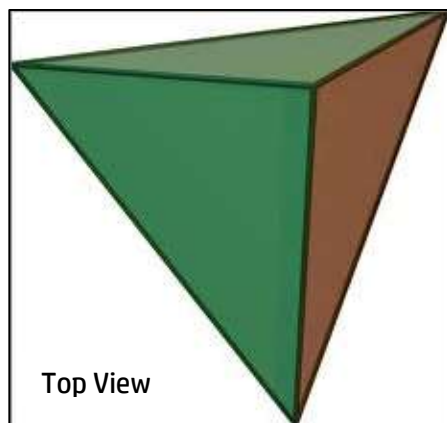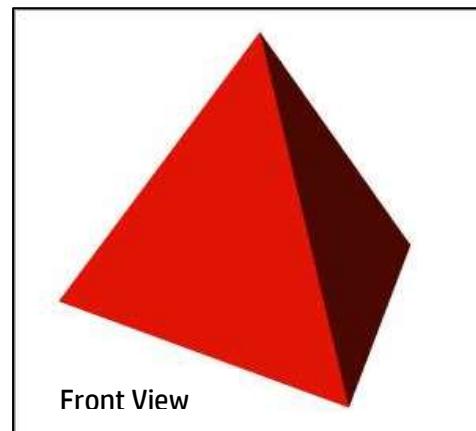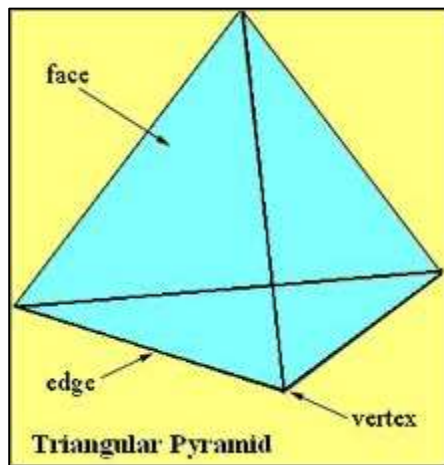
As the theme park is going to come at multiple locations across the country the developer needs a ready-to-use program that can compute surface area of the triangular pyramid and its volume, when the length of the edge is given as input.

Input
The input should be an integer value which will be the length of the edge.

Output
The first line should print the surface area of the triangular pyramid. The second line should print the volume of the triangular pyramid.

Sample Input 1
```
15
```

Sample Output 1
```
 Surface Area: 389.71 square units.
 Volume: 397.75 cubic units.
```

Sample Input 2
```
7
```

Sample Output 2
```
 Surface Area: 84.87 square units.
 Volume: 40.42 cubic units.
```

Question

An application that can print cheques for a given amount (integer value), in words has to be developed. Given below are some examples. The maximum cheque value that would be printed is Hundred Crores.

Input	Output
1	One
10	Ten
100	Hundred
1000	Thousand
10000	Ten Thousand
100000	One Lakh
1000000	Ten Lakhs
10000000	One Crore

Note: Use Indian numbering system.

Input

Input should contain a single integer value representing the amount to be printed.

Output

Print the amount in words.

Sample Input 1

```
101
```

Sample Output 1

```
Hundred one
```

Sample Input 2

```
123456
```

Sample Output 2

```
One Lakh twenty three thousand four hundred fifty six
```

Question

Allied forces wanted to pass on a very secret message to resistance members located deep inside enemy territory. Hence the cryptography team of the allied forces were requested to come up with a mechanism to encrypt any English text message. You, being a software developer, are requested to develop a program based on the logic given by the cryptography team. The requirement was as follows: offset every alphabet in the given English sentence by 'n' positions and reprint it back. . If 'n' is positive, the offset is forward and if 'n' is negative, the offset is backward for the given character in the sentence. Special characters (like a full-stop, comma, white space, etc.) and numeric characters in the sentence should be retained as they are. After 'Z' or ('z') you wrap back to 'A' (or 'a'). Case sensitivity should be maintained i.e., if the input character is lower (or upper) case then respective output character should be retained as lower (or upper) case.

Input

The first line contains a string which is the message to be encrypted. Next line contains the offset.

Output

Encrypted text.

Sample Input 1

```
Hello World!
5
```

Sample Output 1

```
Mjqqt Btwqi!
```

Sample Input 2

```
Hello World!
-5
```
Sample Output 2

```
Czggj Rjmgy!
```

Question

A Pythagorean triplet is a set of three natural numbers, a < b < c, for which, a^2 + b^2 = c^2. Find a Pythagorean triplet (a, b, c) such that their sum (a+b+c) is the given input number, else find the triplet with the sum closest to the given input number, this closest sum should be less than the input number. Ensure proper error handling is done with proper error output as "INVALID INPUT" for invalid values of the input number (i.e. less than 12).

Input

The input is an integer representing the sum of a, b and c.

Output

Print the Pythagorean triplet in one line followed by the sum in the next line as shown in the sample output.

Sample Input 1

```
12
```

Sample Output 1

```
Pythagorean triplet: 3 4 5
12
```

Sample Input 2

```
999
```

Sample output 2

```
Pythagorean triplet: 249 332 415
996
```

Question

Given a list of strings which have an embedded integer in them, your program has to sort the strings in ascending order based on the integer embedded in these strings.

For example, "five9" would be placed after "4foryou", since 4 < 9. If the numbers in two strings are equal, output them in the same order as they are given.

Input

The first line contains the number of strings to be input. The following lines contain the strings to be sorted one per line. All characters in the string will be alphanumeric.

Output

Print each of the sorted strings one per line.

Sample Input 1
```
4
catch22
7wonders
aroundtheworldin80days
dark30
```

Sample Output 1
```
7wonders
catch22
dark30
aroundtheworldin80days
```

Question

Given an MxN matrix composed of alphanumeric characters, there lies a symbol "$" appearing any number of times in the matrix. Develop a solution to replace the other elements of that particular row and column with "$" (where the "$" was found).

Input

First line will take the order of matrix M and N, separated by a space. Subsequent lines will take elements of each row of N characters separated by spaces. Each input row will be taken on a new line.

Output

Print the modified matrix, each row will be printed on a new line.

Sample Input 1

```
4 5
A B C d E
0 $ Q A (
1 0 W h %
2 9 $ 1 )
```

Sample Output 1

```
A $ $ d E
$ $ $ $ $
1 $ $ H %
$ $ $ $ $
```

Question

Given three points (x1, y1), (x2, y2) and (x3, y3) write a program that detects if these three points form an equilateral triangle, an isosceles triangle, scalene triangle or are collinear (i.e. form a straight line). Once the user inputs the 3 points, use the associated formulae to determine the type of the triangle or line. Refer below example based on which, if the point were connected would form either of geometric figure expected. The co-ordinates would be integers or floating point numbers with an accuracy of two decimal places.

Example 1: Input: (x1, y1) = (-1, -8), (x2, y2) = (1, -2) and (x3, y3) = (2, 1).

Output: Collinear.

Example 2: Input: (x1, y1) = (1, 3), (x2, y2) = (-2, -2) and (x3, y3) = (3, -1).

Output: Scalene triangle.

Example 3: Input: (x1, y1) = (2, 3), (x2, y2) = (4, 3) and (x3, y3) = (3, 5).

Output: Isosceles triangle.

Input

The 3 coordinates should be taken as a single input line separated by space.

Output

Print the type of triangle (Equilateral triangle, Isosceles triangle or Scalene triangle), if the points form a straight line then print Collinear.

Sample Input 1

```
-1 -8 1 -2 2 1
```

Sample Output 1

```
Collinear.
```

Sample Input 2

```
2 3 4 3 3 5
```

Sample output 2

```
Isosceles triangle.
```

Question

A software company's (BigDataSys) stocks are being traded in the stock market. An investor is interested in making profit by buying BigDataSys's stock and selling it within a defined period (say x days). The investor consulted a fund manager who gave him a list of extrapolated value of BigDataSys's stock for next x days. He can buy BigDataSys's stock on any day and can sell it later within this x period. Given the stock value of the company on each day in this period by the fund manager, find the maximum profit or the minimum loss the investor can make during this period.

Input

The first line should take the number of days of the stock value. The next line should take the list of stock values for those number of days.

Output

Print the maximum profit or minimum loss that can be made using the given the list of stock values.

Sample Input 1
```
6
23171 21011 21123 21366 21013 21367
```

Sample Output 1
```
Profit: 356
```

Sample Input 2
```
6
10123 12345 10324 13234 11345 12234
```

Sample Output 2
```
Profit: 3111
```

Sample Input 3
```
6
600 500 400 300 200 100
```

Sample Output 3
```
Loss: 100
```

Question

Write a program which will take an expression as input and will evaluate this expression using BODMAS rules and will print the evaluated value, if the expression is incorrect then print "INVALID INPUT". All associated BODMAS rules are applicable. The expression input can be of any length. Spaces between numbers, operators and brackets are valid. Consider valid operators as +, -, *, / and %.

Input

Input should be of a single line containing a mathematical expression.

Output

Output should be a single integer value if the expression is valid or "INVALID INPUT" should be printed if the expression is not valid.

Sample Input 1
```
1*2+3
```

Sample Output 1
```
5
```

Sample Input 2
```
100*2)*9+10
```

Sample Output 2
```
INVALID INPUT
```

Question

Four Musketeers have to cross a bridge at night. All of them are on the same side of the bridge. Anyone who crosses, either one or two Musketeers, must carry the torchlight with them. The torchlight must be walked back and forth; it cannot be thrown, etc. Each Musketeer walks at a different speed. The bridge can support at most two men at a time. When two Musketeer cross together, they must walk at the slower Musketeer's pace.

Write a program to help the Musketeers to find the shortest time for all of them to cross the bridge. Your input will be the speed at which each Musketeer walks (units in meters/minute) and the length of the bridge in meters. Your output should be the shortest time in minutes for all the Musketeers to be on the other side of the bridge. Note that the enemies are behind them, you have to save the kingdom!

Input

On a single line first four values each separated by a space will denote the speed of each Musketeer and the fifth value will be the length of the bridge.

Output

You will print on a new line the shortest time taken by the Musketeers to cross the bridge with unit of time mentioned (example 20 minutes).

Sample Input 1
```
50 25 10 5 50
```

Sample Output 1
```
17 minutes
```

Sample Input 2
```
20 50 10 100 500
```

Sample Output 2
```
85 minutes
```

A Plate Shipping Company as their name suggests, exclusively sells plates. They pride themselves in offering the widest selection of dinner plates in the universe from a large number of manufacturers.

In a recent cost analysis the company has discovered that they spend a large amount of money on packing the plates for shipment. Part of the reason is that plates have to be stacked before being put into shipping containers. And apparently, this is taking more time than expected. Maybe you can help.

A shipment of plates consists of plates from several manufacturers. The plates from each manufacturer come stacked, that is, each arranged in a single stack with plates ordered by size (the smallest at the top, the largest at the bottom). We will call such a stack properly ordered. To ship all these plates, you must combine them into a single stack, again properly ordered. To join the manufacturers' stacks into a single stack, two kinds of operations are allowed.

- Split: a single stack can be split into two stacks by lifting any top portion of the stack and putting it aside to form a new stack.

- Join: two stacks can be joined by putting one on top of the other. This is allowed only if the bottom plate of the top stack is no larger than the top plate of the bottom stack, that is, the joined stack has to be properly ordered.

Note that a portion of any stack may never be put directly on top of another stack. It must first be split and then the split portion must be joined with the other stack. Given a collection of stacks, you have to find the minimum number of operations that transforms them into a single stack. The following example corresponds to the sample input, and shows how two stacks can be transformed to a single stack in five operations:
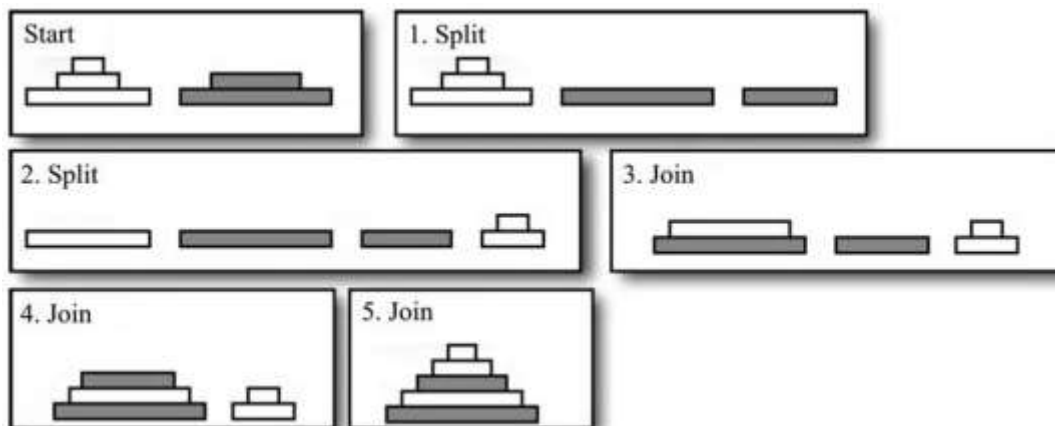
Input

Input should start with a line containing a single integer "n" (1 ≤ n ≤ 50), the number of stacks of plates that have to be combined for a shipment. This is followed by "n" lines, each describing these stacks. These lines start with an integer "h" (1 ≤ h ≤ 50), the height (number of plates) of the stack. This number is followed by "h" positive integers that give the diameters of the plates, from top to bottom. All diameters are at most 10 000. These numbers will be in non-decreasing order.

Output

Print the minimum number of operations (splits and joins) that have to be performed to combine the given stacks into a single stack.

Sample Input 1

```
3
4 1 2 3 4
4 5 6 7 8
4 9 10 11 12
```

Sample Output 1

```
2
```

Sample Input 2

```
2
3 1 2 4
2 3 5
```

Sample Output 2

```
5
```

Question

There is an arbitrary square matrix consisting of 0's, 1's or 2's. There are some arbitrary rules in forming this matrix.

If there are adjacent 1's, they are said to be connected. Similarly, if there are adjacent 2's, they are said to be connected. Here, adjacent means all the surrounding positions along with the diagonal positions.

Now given such a matrix of 0's, 1's or 2's, do your computation according to the following rules:

1. If there is a path from any position in top row to any position in bottom row consisting only of 1, then print 1.
2. If there is a path from any position in first column to any position in last column consisting only of 2, then print 2.
3. If both Rule 1 & Rule 2 are true, print AMBIGUOUS.
4. If neither of Rule 1, Rule 2 or Rule 3 are satisfied, print 0.

Input

The first line of the input is the order of the square matrix. The subsequent lines would each contain the elements of a row separated by a space.

Output

Print either 0, 1, 2 or AMBIGUOUS based on the above rules.

Sample Input 1
```
4
0 0 0 1
0 0 1 0
0 2 1 2
0 1 2 0
```

Sample Output 1
```
1
```

Sample Input 2
```
4
0 0 0 0
0 0 0 0
0 2 1 2
0 1 0 0
```

Sample Output 2
```
0
```

Question

Develop a software that determines the number of trailing zeros at the end of X! (X factorial), where X is an arbitrary number to be taken as input. Note: if there are no trailing zeros then print 0 as the output. Assume the max length of the resulting factorial output can be 5000 digit long.

Input

The input is an integer number whose factorial needs to be determined.

Output

First line should contain the factorial of input and the second line should contain the count of trailing zeros at the end of X!.

Sample Input 1
```
5
```

Sample Output 1
```
120
1
```

Sample Input 2
```
25
```

Sample Output 2
```
15511210043330985984000000
6
```

Question

A popular fast food chain "Yumm Foods!" sells ready to eat packaged food and people are always queuing up to buy one of their food packages. Each food package has a fixed cost associated with it, Rs.50.

Customers usually carry Rs.50 or Rs.100 notes. And, the manager, of course, has no money at all to start with, on any day. Every customer has the money to pay but some may not have the exact change. For simplicity, assume each customer has exactly one Rs.50 note or has exactly one Rs.100 note. Eager to get their food, the customers line up to purchase their package. This line can be called "Order Q". The manager forms a second line for the customers who do not have the exact change. This second line can be called the "Change Q".

The package will be purchased as follows. If the manager is able to give the correct change, she/he will sell a package to the first customer in "Change Q", if there is one, and gives back the correct change. Otherwise, if the first customer in "Order Q" has the exact change, the manager will sell that customer a package. However, if the first customer in "Order Q" does not have the exact change, then that customer will go to the back of "Change Q" and wait. It is possible that not every customer will be able to get a package because there might not be enough Rs.50 notes with the manager.

Write a program to list the names of the customers in the "Change Q" when the line is at its longest (note that the line might reduce after reaching the maximum length, you still need to print the maximum).

There can be at most 100 customers in "Order Q".

Input

The first line should take the number of customers and list of customer names and the amount (separated by space) that each of them can use to pay for the food package (either Rs.50 or Rs.100) on subsequent lines.

Output

The output should be a list of the names of the customers waiting in "Change Q" when it is at its longest, from the front of the line to the back. If no customer ever gets in Change Q, your output should print "None".

Sample Input 1
```
7
Arun 50
Beena 50
Kavya 100
Pooja 100
Ebenezer 50
Nithin 100
Gautam 50
```

Sample Output 1
```
None
```

Sample Input 2:
```
11
Hari 100
Indu 50
James 50
Karthik 100
Lucas 100
Mala 100
Nithin 50
Omar 100
Padma 100
Mohammed 100
Reddy 50
```

Sample Output 2:
```
Mala Omar Padma Mohammed
```

## Question

On day of Makara Sankaranti, a group of friends went out to fly some kites. Once the kites were out in the air, as a spectator, you could see quite a number of kites intersecting one another. You thought of coming up with a program to find the intersecting points among a set of N Kites being flown in air, with each flying kite being defined by points X1,Y1 (thread starting at the person's hand) and X2,Y2 (thread ending at the kite's end). The co-ordinates of the endpoints can be positive or negative assuming that the line defined by flying kite is straight.
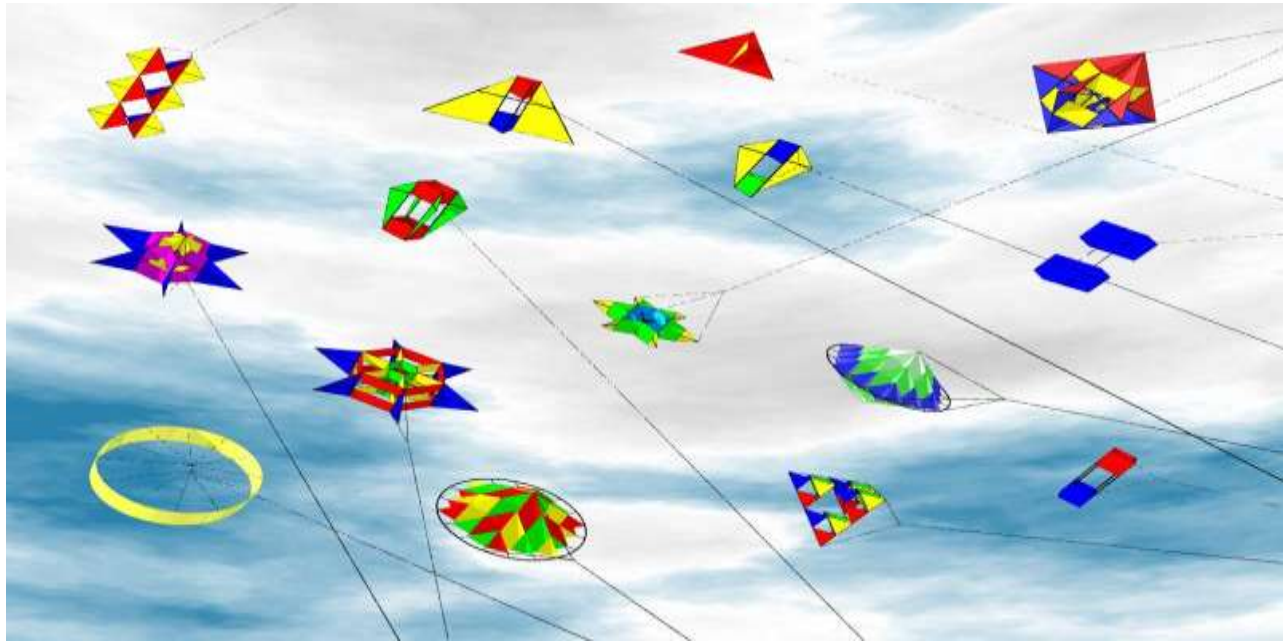
## Input
First line should take the number of lines, next line should take all coordinates separated with spaces.

## Output
Print the total number of unique intersections followed by all the intersecting points in new a new line.

**Sample Input 1**
```
4
-600 700 -200 -700 -200 500 -10 500 -700 10 200 400 -700 -700 100 -10
```

**Sample Output 1**
```
2
-435.59 124.58
-298.85 -354.01
```

**Sample Input 2**
```
 5
-972 85 -343 -14 -714 -639 270 -401 610 583 -702 -79 262 874 82 76 896
-339 -740 519
```

**Sample Output 2**
```
4
-518.45 13.61
143.24 347.48
-140.23 204.45
84.40 86.64
```

**Question**

Given a square matrix of order M, with MxM alphabets, find the valid English words that are hidden in this matrix. These hidden words can start in any direction i.e. starting from any row or column and proceeding horizontally, vertically, diagonally or in reverse. These hidden words in the matrix are part of a dictionary of 'K' words which is also provided to you. The first line of your input is 'M', the number of rows and columns of alphabets. Next each row of the MxM characters are input one by one (with spaces between characters). Following this will be the size of the dictionary and words of the dictionary one per line. You have to find these hidden words in the matrix.

**Input**

The first line will be the input M which corresponds to the order of the matrix. The next M lines that are input will each contain M alphabets separated by a space corresponding to the elements of each row of this matrix. This will be followed by the size of the dictionary, 'K' as input, which would be followed by 'K' dictionary words, one word per line.

**Output**

First line of the output will list the count of words found in the matrix followed by each valid word found in the subsequent lines, one per line.

**Sample Input**

10

```
w  v  e  r  t  i  c  a  l  l
r  o  o  a  f  f  l  s  a  b
a  c  r  i  l  i  a  t  o  a
n  d  o  d  k  o  n  w  d  c
d  r  k  e  s  o  o  d  d  k
o  e  e  p  z  e  g  l  i  w
m  s  i  h  o  a  e  r  a
a  l  r  k  r  r  i  r  e  r
k  o  d  i  d  e  d  r  c  d
h  e  l  w  s  l  e  u  t  h
```

```
19
up
seek
sentence
find
view
random
sleuth
down
letter
backward
north
vertical
diagonal
wikipedia
east
horizontal
wordsearch
line
west
```

Sample Output
```
10
seek
find
random
sleuth
backward
vertical
diagonal
wikipedia
horizontal
wordsearch
```

Question

A magic square of order 'n' is an arrangement of n^2 distinct integers, in a square matrix, such that the sum of numbers in each row, each column, and each of the 2 diagonals sum up to the same constant given by C = n*(n^2+1)/2. The elements of the magic square range from 1 to n^2. Write a program to generate odd sized magic squares (i.e. n is odd) and the sum along a row or a column or a diagonal. Ensure proper error handling is done to output message "INVALID INPUT" for invalid values of 'n'.

Note: There could be multiple solutions for a magic square of any given order 'n'. All possible solutions would be considered valid as long as the output satisfies the formula C = n*(n^2+1)/2 which gives the sum, 'C', along each row, each column and each diagonal.

Magic Square of size 3

 2 7 6

 9 5 1

 4 3 8

Sum in each row, each column and each diagonal = 3*(3^2+1)/2 = 15

OR

Magic Square of size 5

23 6 19 2 15

4 12 25 8 16

10 18 1 14 22

11 24 7 20 3

17 5 13 21 9

Sum in each row, each column and each diagonal = 5*(5^2+1)/2 = 65

OR

Magic Square of size 5

 9 3 22 16 15

 2 21 20 14 8

25 19 13 7 1

18 12 6 5 24

11 10 4 23 17

Sum in each row & each column = 5*(5^2+1)/2 = 65

Input

Input should contain an odd integer value.

Output

First line of the output should contain the sum of row/column/diagonal followed by each row of the magic square on a new line.

Sample Input 1

```
3
```

Sample Output 1

```
Sum of Row/Column/Diagonal = 15
2   7   6
9   5   1
4   3   8
```

**Sample Input 2**

```
4
```

Sample Output 2

```
INVALID INPUT
```

Question

You are required to travel from Bengaluru to Mumbai. There are multiple roads in which one can reach Mumbai and all these roads can be represented by a matrix. The matrix of these roads are connected horizontally, vertically and diagonally. You can take maximum of 6 hops and a minimum of 3 hops, 1 hop at a time to reach the destination. You are given the time in hours each intermediate hop will take. Find the path which takes the shortest time to reach Mumbai.

The information on the hops is presented in a fixed size 4x4 matrix, refer to Figure 1 below, where the element in matrix location {0, 0} is the starting point Bangalore and the element at {3, 3} is the end point Mumbai.

Figure 1
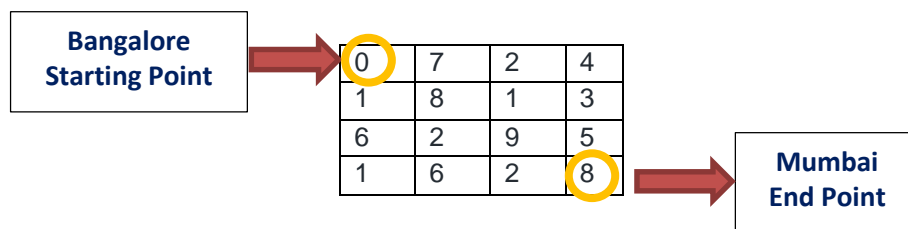
You need to develop a program that can traverse the matrix to determine the shortest path from Bangalore to Mumbai for any given 4x4 matrix as per the criteria defined in the problem above. Bon Voyage!

Legend
B – For down move
D – Diagonal move
R – Right move

Input
Take the time hop values of each row on new line each.

Output
Print the direction taken for every hop as per the legend defined above showcasing the path taken to reach Mumbai. Furthermore, on a new line, print "Time taken is" followed by the time values of each hop separated by "+" sign in between each hop and then "=" followed by total time taken in hrs. Refer sample input and output, also note the output is needed as requested in the above or shown in the sample output below.

Sample Input 1

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

Sample Output 1
```
The shortest path is BDDR
Time taken is 0+1+2+2+8=13 hrs
```

Sample Input 2
```
0       2       2       8
1       6       9       5
8       1       1       3
2       7       4       5
```

Sample Output 2
```
The shortest path is BDRD
Time taken is 0+1+1+1+5=8 hrs
```