Alien Numeric Lanugage

In the supposedly uninhabited Alien Desert, an alien species has been discovered. The aliens have only 3 fingers and a thumb on each hand, and thus have their own numbering system. The digits they use and the symbols they use for digits are quite unusual, but anthropologists have been able to represent them as follows:

$ represents 0

! represents 1

'* represents 2

~ represents 3

`# represents 4

% represents 5

[represents -1

| represents -2

'[and | are two negative digits.

There system is working in base 8 and thus in order to interpret their numbers to decimal system each item is a place value to the power 8.

As shown in following example [% # is -1*82 + 5*81+4*80
= -1*64+ 40 +4 = -24 in base 10 [and | are two negative digits.

Write a program that can convert the alien species numbers system to decimal numbers

Input Format

Input is given as an Alien species language line by line and each line is considered as new input.

Input is alien speices language

Constraints

Task: Your task is to take the script of alien species that

- are in text file and are one per line.
- Total number of sequence per line is maximum 5,
- Anything above the maximum number of sequence is considered to be non-valid input.
- Anything other than above digits used by aliens is considered to be non-valid too.

Output Format

Output is a decimal number

Sample Input

[% #

^:!$

|

~*[|

Sample Output

-24

not a valid output

-2

1654

Explanation

[% # is

=-1*8 to the power 2 + 5*8 to the power 1+4*8to the power 0
= -1*64+ 40 +4 = -24 in base 10

---

^:!$ is not a valid input as it doesnt exist in alien number system

---

| is -2 as -2 * 8 power 0 is -2 in base 10 too .

~ * [| is

= 3*8 to the power 3 + 2 * 8 to the power 2 + -1 * 8to the power 1 + -2 * 8 to power 0

= 3* 512 + 2*64 -8 -2

= 1536 +128 -10

=1654 in base 10

Even Sheep

On a farm divided into a grid of cells, every cell either has grass on it or is empty.

If two adjacent cells have grass, they will belong to a common field. The common field extends in all directions to all adjacent cells with grass. So, if cell A is adjacent to cell B and cell B is adjacent to cell C, and all three have grass, then they all lie in the same field. If a cell with grass has no adjacent cell with grass, then it will be a field 1-cell field.

Every field must feed one sheep or one cow. Each field of grass cannot be shared between cows and sheep. If each field can have one sheep or one cow and never both, how many possible unique arrangements can you make such that, there are even number of sheep in the grid farm?

Input Format

The first line contains R (number of rows) and C (number of columns), separated by a space. Each of the next R lines contains a string with length equal to C, with no spaces. The string has the character Y to denote a cell with grass and N to denote a cell with no grass.

Constraints

$1 \leq R, C \leq 5000$

Output Format

S, an integer that contains the number of arrangements possible, modulo 1,000,000,007.

Sample Input

3 4
YNNY
NYNY
NYNN

Sample Output

4

Explanation

There are three fields, as follows:
1	-	-	2
-	3	-	2
-	3	-	-

First Solution (zero sheep)
Cow
Cow
Cow

Second Solution (two sheep)
Sheep
Cow
Sheep

Third Solution (two sheep)
Sheep
Sheep
Cow

Fourth Solution (two sheep)
Cow
Sheep
Sheep

So, the total number of ways is 4.

Good numbers

Starting with any positive integer n, replace it by the sum of the squares of each of its digits, and repeat the process until the number either equals 1, or the process loops endlessly in a series which never reaches 1. Those numbers for which this process ends in 1 are good numbers, while those that do not end in 1 are bad numbers.

Input Format

Each case consists of a single line containing one positive integer indicating the number of digits of the 10 good numbers to find.

Constraints

Number of digits between 1 and 4 inclusive

Output Format

For each test case, output one line containing the list of the 10 first good numbers (separated by a single space) in the range

Sample Input

```
5
```

Sample Output

10000 10003 10009 10029 10030 10033 10039 10067 10076 10088

Explanation

For example, the first five-digit good number is 10000 because 1 * 1 + 0 * 0 + 0 * 0 + 0 * 0 + 0 * 0 = 1 + 0 + 0 + 0 + 0 = 1

Internet Spam

The goal is to write a program that will find all the links in a text file and insert the nofollow attributes properly. rel=" " should be inserted as the last property of the link, unless it already exists. The **nofollow** value should be inserted last in the **rel= string** , **rel** could have multiple values, space separated. Refer to the sample input for examples.

Input Format

Each input line will contain lines of text, each containing one link in the form
< a * * * * > * * * * * < /a>.

You can have more than one input line

Constraints

Each line will be no more than 255 characters long.

Output Format

The output will contain just the parsed links. with **nofollow** inserted in the rel = " "

Sample Input

< a href="http://PSU.KSA/" rel=" ">link with rel< /a>
< a href="http://compsci.psu/blog" rel="external "> more rels< /a>

Sample Output

< a href="http://PSU.KSA/" rel="nofollow"> link with rel < /a>
< a href="http://compsci.psu/blog" rel="external nofollow">more rels< /a>

Explanation

The Sample input contains a link with < a ---------- rel = " "> ends with < /a>
The Sample ouput contains the parsed link with **nofollow** inserted in the rel= " "

Math Practice

You have devised a strategy that helps your kid practice his mathematics. First, you pick a positive integer N. Then you tell your kid to starts naming N, 3 × N, 5 × N, 7 x N and so on.

Whenever he names a number, he thinks about all of the digits in that number. He keeps track of which digits (0, 1, 2, 3, 4, 5, 6, 7, 8, and 9) he has seen at least once so far as part of any number he has named. Once he has seen each of the ten digits at least once, he is allowed to go play.

Input Format

Each case consists of one line with a single positive integer N, the original number chosen.

Constraints

N >= 0

Output Format

For each test case, output one line containing either the last number after all ten digits were used or NO PLAY (in uppercase letters) if the process does not end.

Sample Input

```
18
```

Sample Output

```
270
```

Explanation

- N = 18. Now he has seen the digits 1 and 8.
- 3N = 54. Now he has seen the digits 1, 4, 5 and 8.
- 5N = 90. Now he has seen the digits 0, 1, 4, 5, 8 and 9.
- 7N = 126.Now he has seen the digits 0, 1, 2, 4, 5, 6, 8 and 9.
- 9N = 162.Now he has seen the digits 0, 1, 2, 4, 5, 6, 8 and 9.
- 11N = 198.Now he has seen the digits 0, 1, 2, 4, 5, 6, 8 and 9.
- 13N = 234.Now he has seen the digits 0, 1, 2, 3, 4, 5, 6, 8 and 9.
- 15N = 270.Now he has seen all ten digits.

The answer is the last number computed i.e. 270

Matrix Chain Multiplication

Given a sequence of matrices, we want to find the most efficient way to multiply these matrices together to obtain the minimum number of multiplications. The problem is not actually to perform the multiplication of the matrices but to obtain the minimum number of multiplications.
We have many options because matrix multiplication is an associative operation, meaning that the order in which we multiply does not matter. The optimal order depends only on the dimensions of the matrices.
The brute-force algorithm is to consider all possible orders and take the minimum. This is a very inefficient method.
Implement the minimum multiplication algorithm using dynamic programming.

Input Format

The input file must contain the dimensions of the matrices each on a separate line.

Constraints

Input should consist of positive integers.

Output Format

The output file must contain the minimum number of multiplications needed to multiply the matrices as an integer.

Sample Input

```
20
2
30
12
8
```

Sample Output

```
1232
```

Explanation

The above input and output samples correspond to the multiplication of these four matrices:
A1 (20x2) * A2 (2x30) * A3 (30x12) * A4 (12x8)

Numbers triangle

Write a program that prompts the user to enter a nonnegative number or 0 to quit.

Accordingly this number will present number of rows to be displayed.

Columns are going to be iterated depending on row number.

Input Format

Enter number of lines(Press 0 to quit):
3

Constraints

negative numbers are not allowed

Output Format

```
1
22
333
```

Sample Input

Enter number of lines(Press 0 to quit):
3

Sample Output

```
1
22
333
```

Explanation

negative numbers are not allowed

OCR

Optical Character Recognition (OCR) is the process of extracting textual information from images. While the current technology is mostly software based, rather than using optical devices, the term has stuck around.

We have a very simple alphabet {A, B, C, D, E}, where each letter is strictly defined by a 2x2 or 2x3 bitmap as follows

A is defined by

```
xo
xx
```

B is defined by

```
xx
xx
```

C is defined by

```
xox
xxx
```

D is defined by

```
xx
ox
```

E is defined by

```
xxx
oxx
```

Write a program to transform a set of two lines of OCR into a word in the alphabet defined above.

Input Format

The input will be a set of 2 lines of OCR of the same length. They will spell out some word in the above alphabet. It will always be a valid word, and it will not be ambiguous (in a way that only one possible word could make the design pattern).

Constraints

The input lines are between 2 and 30 character-long inclusive.

Note: you would need to take a word as a whole to distinguish between some of the cases. For example: in the below sample, while the first character could be read as C, the rest of the word would not be made of valid characters.

xoxox
xxxxx

Output Format

The output will contain the recognized word.

Sample Input

xoxox
xxxxx

Sample Output

AC

Explanation

The above sample input contains 2 lines of characters representing a word.

```
xo
xx
```

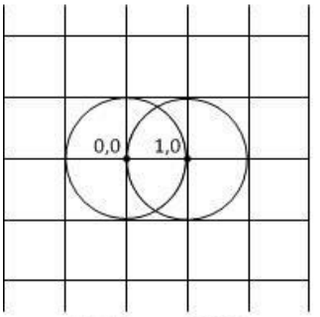
represents A and

```
xox
xxx
```

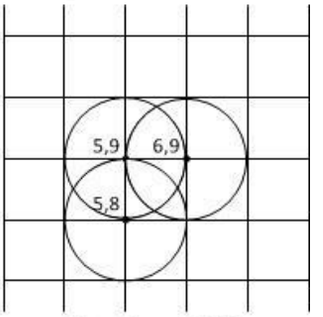
represents C

Overlapping Spots

Imagine a solar panel consisting of solar cells laid out in a perfect grid with negligible gaps between the cells. Beams of sunlight fall on the panel forming perfect circular spots of sunlight. The spots may overlap each other. You have to find the total area covered by the sunlight.



Total Area = 5.0548



Total Area = 6.8402

Each solar cell is a square of dimensions, 1 unit by 1 unit. Each circular spot of sunlight is of radius 1 unit. Spots are always centered at the point where the corners of cells meet. What is total area covered by the sunlight?

Input Format

The first line of each data set contains a single integer n, where,$0 \leq n < 200$. n is the number of circles present in the data set. The next n lines contain two integers x and y, as coordinates of the centers of n circles. Each coordinate set occurs only once. An example data set corresponding to the circles shown in the figures above is given below. Use the value of π from Java.

Constraints

$0 \leq n < 200$ Each coordinate set occurs only once.

Output Format

```
5.0551
```

Sample Input

```
2
0 0
1 0
```

Sample Output

```
5.0551
```

Explanation

The output must be correct upto three decimal places.

Sam the Hacker

Sam is a hacker. He was caught by FBI some months ago. He decided to help FBI and was released from Jail. He has to write a program that validates a secret code and checks if it is acceptable or not with the following conditions:

> The Code must be 10 digits long.
> The sum of all even digits must be more than the sum of all odd digits.

The program returns the following values: -1 if the length is not 10 digits -2 if the value L is not a proper code. 1 if the code is valid

Input Format

Input is a long integer

Constraints

There are no limits to the input

Output Format

integer with values 1, -1 or -2

Sample Input

2451953429

Sample Output

-2

Explanation

Sample input 1:

24519 53429 even digits: 2+5+9+3+2 = 21 odd digits: 4+1+5+4+9 = 23

since sum of even digits < odd digits so return -2 (Not a proper code)

Shawarma Restaurant

You are going to write a program that assists a waiter to take orders in a shawarma restaurant. Typically waiter goes to a table and asks the customers to make order. Each order can consist of various numbers of items (pepsi, shawarma, fries, juice).

Your program computes the total money a waiter collected for all orders.

Input Format

The first line contains a non negative integer *n* that tells the program to read *n* lines from the console. Each subequent line contains four space seperated integers. Each of these integers is a count of Pepsi, Shawarma, Fries and Juice (in that order).

Constraints

All values are non negative integers

Output Format

a non negative integer

Sample Input

```
3
1 1 0 0
0 3 1 1
0 2 2 2
```

Sample Output

```
61
```

Explanation

The above contains 3 orders; a total of 1 pepsi*1.5 + 6 shawarma * 5 + 3 fries * 3 + 3 juices * 7 = 1.5+30+9+21 = (int)61.5 =61

String Permuation

Given two strings, write a method to decide if one is a permutation of the other. This question is case sensitive, and whitespace is significant. For example `"tab"` and `"BAT"` are not permutations of each other. Similarly, `"tab "` and `"bat"` are not permutations of each other.

Input Format

Two strings of length N and M, separated by the newline character.

Constraints

$$0 <= N, M <= 1000000$$

Output Format

The string `true` if the strings are permutations of each other, or the string `false` if they aren't.

Sample Input

```
newyorktimes
monkeyswrite
```

Sample Output

```
true
```

Explanation

Clearly, we can rearrange the letters of one word to reproduce the second, so the result is `true`

Subtraction Simulation

Some applications deal with very large numbers (50 digits at most). You are asked to write a program that simulates the subtraction of 2 very large numbers. Since the numbers are very large, you will read them as strings, then perform the subtraction using the strings.

Input Format

Each case consists of a single line containing two strings separated by spaces. You have to subtract the number represented by the second string from the number represented by the first string.

Constraints

The second string is always shorter than the first.

Output Format

For each test case, output one line containing the first number, a space, a minus sign, a space, the second number, a space, an equal sign, a space and the result of the subtraction.

Sample Input

```
12345678976543211234 96545478123321
```

Sample Output

```
12345678976543211234 - 96545478123321 = 12345582431065087913
```

Explanation

Use arrays to subtract the second number from the first number