

Problems

Problem	DOLLARS	CARDS	T9	PALIN
Executable file	DOLLARS.EXE	CARDS.EXE	T9.EXE	PALIN.EXE
Source file	DOLLARS.BAS	CARDS.BAS	T9.BAS	PALIN.BAS
	DOLLARS.PAS	CARDS.PAS	T9.PAS	PALIN.PAS
	DOLLARS.C	CARDS.C	T9.C	PALIN.C
	DOLLARS.CPP	CARDS.CPP	T9.CPP	PALIN.CPP
Input file	DOLLARS.IN	CARDS.IN	T9.IN	PALIN.IN
Output file	DOLLARS.OUT	CARDS.OUT	T9.OUT	PALIN.OUT
Time limit per test	10 seconds	10 seconds	10 seconds	10 seconds
Number of tests	10	10	10	10
Points per test	3	4	6	7
Total points	30	40	60	70
	200			

DOLLARS

Dave somehow acquired exchange rates of US dollar to German marks for several days in the future. Write a program that will suggest Dave when to buy or sell marks or dollars so that, starting with 100 dollars he ends up with the highest possible amount of dollars at the end of the last day.

Input data

The first line of input file contains a natural number N , $1 \leq N \leq 100$, the number of future days for which Dave knows exchange rates.

Each of N following lines contains a natural number A , $1 \leq A \leq 100$. Number A in the $(i+1)^{\text{th}}$ line denotes the medium exchange rate of i^{th} day in advance. It tells Dave that on that day he will be able to either buys A marks for 100 USD or buy 100 USD for A marks.

Output data

The first and only line of output file should contain a desired amount written to two decimal places.

Remark: Due to real arithmetic round off errors, results within error of 0.05 marks of correct value will be regarded as correct.

Examples

DOLLARS . IN	DOLLARS . IN	DOLLARS . IN
3	4	5
300	100	400
150	200	300
200	400	500
	100	300
DOLLARS . OUT	DOLLARS . OUT	DOLLARS . OUT
200.00	400.00	266.66

Explanation (needs not to be printed)

Example #3

```
Day 1 ... changing 100.0000 USD = 400.0000 DEM
Day 2 ... changing 400.0000 DEM = 133.3333 USD
Day 3 ... changing 133.3333 USD = 666.6666 DEM
Day 5 ... changing 666.6666 DEM = 266.6666 USD
```

CARDS

Dave and Hal are playing one interesting game with cards. Dave has N cards (N is divisible by three, $N=3K$) with numbers from 1 to N written on them. Each card has the same number written on both sides, and no two cards share the same number. Cards are sorted.

First Hal thinks of one number from set $\{1, 2, \dots, N\}$.

Then Dave lays cards in K rows and three columns on a table starting with card numbered by 1 filling the first row from left to right, then second row, and so on till he finishes with the last row.

Hal then says in which column Dave put the card with a number he thought of.

Dave then picks up the cards from the first column (firstly taking card from the first row, then from the second and so on to the last row), then from the second and finally from the third column in the same way. He then lays them, without shuffling, to the table again the same way as the first time.

Each time Dave puts all the cards on the table, Hal tells him in which column is the card with his number.

Dave's task is to guess Hal's number.

Write a program that will use Hal's answers to help Dave to determine the smallest set of numbers that are candidates for Hal's number,

Input data

The first line of input file contains a natural number N , $3 \leq N \leq 999$, the number of all cards.

The second line contains a natural number D , $1 \leq D \leq 10$, the numbers of dealings (i.e. the number of Hal's answers).

The following D lines contain words '**first**', '**second**' or '**third**', denoting Hal's answers – one word in each line.

Output data

To the first and only line of output file should be written all the numbers from the smallest set of numbers that are candidates for Hal's number. The numbers can be written in any order, and must be separated by a space.

Examples

CARDS . IN

6
1
second

CARDS . OUT

5 2

CARDS . IN

12
2
third
first

CARDS . OUT

6

CARDS . IN

18
2
first
third

CARDS . OUT

7 16

T9

T9 is a system developed to satisfy rapidly growing needs for quick sending textual messages (SMS) using mobile phones. It is based on a dictionary stored in a memory of a mobile phone. While typing words it is sufficient to press a key for each letter once. The first word from dictionary that begins with letters corresponding to pressed keys is displayed.

The arrangement of letters on a mobile phone keyboard is given with the following table:

1	2	3	4	5	6	7	8	9
space	A B C	D E F	G H I	J K L	M N O	P Q R S	T U V	W X Y Z

A message consists of a sequence of words separated by one space. Write a program that will simulate T9 system based on a given dictionary.

Input data

The first line of input file contains a natural number M , $1 \leq M \leq 100$, the number of words in a dictionary. Next M lines contain dictionary words, one word in each line. The words are sorted in ascending order. The words contain only capital letters of English alphabet (A–Z). Length of each word from dictionary will be 100 or less.

The next, $(M+2)^{\text{th}}$ line contains a natural number N , $1 \leq N \leq 100$, the number of presses on a mobile phone keyboard.

The following line contains N natural numbers from set $\{1,2,\dots,9\}$, separated with one space, the numbers of pressed keys.

Output data

The first and only line of output file should contain a message obtained by T9 system. Each letter of a word which is not in a dictionary should be replaced with a '*' character. If more than one word match a sequence of pressed keys, then the first one should be chosen.

Examples

T9.IN

```
3
ABC
BBB
DEF
10
2 2 2 1 2 3 1 2 2 2
```

T9.OUT

```
ABC ** ABC
```

T9.IN

```
4
BOK
GDJE
KAKO
STO
11
2 6 5 1 5 2 5 6 1 7 4
```

T9.OUT

```
BOK KAKO **
```

T9.IN

```
5
GGTMM
GOTOVO
HITNO
ME
NAZOVI
15
6 2 9 6 8 4 1 6 3 1 4 4 8 6 6
```

T9.OUT

```
NAZOVI ME GGTMM
```

PALIN

A palindrome is a word that is read the same forward or backwards. If a word is not a palindrome, it can be cut into parts that are palindromes. Write a program that will calculate the smallest number of palindrome parts to which a given sequence of characters can be cut.

Input data

The first and only line of input file contains a sequence of characters. The characters used as input will be from the set of small letters of English alphabet (a–z). The length of every input sequence will be at most 100.

Output data

The first and only line of output file should contain required number of palindromes.

Examples

PALIN.IN

anaban

PALIN.OUT

2

PALIN.IN

abaccbcb

PALIN.OUT

3

PALIN.IN

anavolimilana

PALIN.OUT

5

Explanations:

- #1 a_naban
- #2 aba_cc_bcb
- #3 ana_v_o_limil_ana