

Problems

Problem	ROOMS	BARCODE	MASS
Executable file	ROOMS.EXE	BARCODE.EXE	MASS.EXE
Source file	ROOMS.BAS	BARCODE.BAS	MASS.BAS
	ROOMS.PAS	BARCODE.PAS	MASS.PAS
	ROOMS.C	BARCODE.C	MASS.C
	ROOMS.CPP	BARCODE.CPP	MASS.CPP
Input file	ROOMS.IN	BARCODE.IN	MASS.IN
Output file	ROOMS.OUT	BARCODE.OUT	MASS.OUT
Time limit per test	10 seconds	10 seconds	10 seconds
Number of tests	10	10	10
Points per test	3	5	7
Total points	30	50	70
	150		

ROOMS

A hotel has N rooms with two beds, numbered with numbers from 1 to N .

When a group of guests arrive, they are accommodated in the following way: While there are empty rooms, each pair of guests is accommodated in an empty room with lowest number. If there is odd number of guests in a group then the last person will be accommodated alone in an empty room with lowest number. If there are no more empty rooms, then each guest is accommodated in a room with lowest number occupied by one guest, i.e. together with a guest from some other group.

The hotel is initially **empty**. The order of arrivals of groups is known in advance. Write a program that will determine how many guests there will be in every room after last of them is accommodated.

Input data

The first line of input file contains two integers N , $1 \leq N \leq 100$, and G separated by a space character. Number N is number of rooms in a hotel and G is number of groups of guests.

The next G lines contain numbers of guests in each group – $(i+1)^{\text{th}}$ line contains number of guests in i^{th} group (groups are numbered by order of arrival to a hotel).

Total number of guests (i.e. the sum of all numbers of guests in all groups) will be less than or equal to the number of all available beds in the hotel rooms.

Output data

The output file should consist of N lines: i^{th} line should contain number of guests in i^{th} room after all guests were accommodated in the hotel.

Examples

ROOMS.IN

7 3
3
1
4

ROOMS.OUT

2
1
1
2
2
0
0

ROOMS.IN

5 4
3
1
1
4

ROOMS.OUT

2
2
2
1
2

ROOMS.IN

8 7
3
1
3
2
1
3
1

ROOMS.OUT

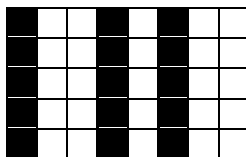
2
2
2
2
1
2
1
2

BARCODE

To speed a work of cashiers, each product is marked with a series of black and white vertical bars called bar code. It can be transformed to a sequence of zeroes and ones with an optical reader. That sequence represents a code of a product.

Bar code consists of black and white vertical bars, which can be thin or thick. White and black bars **alternate**, i.e. no two adjacent bars are of the same color. Thin bar represent 0 and thick bar represent 1, regardless of its color. Thus a bar code represents a sequence of binary digits.

Each bar in a bar code on a product appears as five 'squares' high column (see the picture below). Width of a thin bar is one and of a thick bar are two 'squares'. For example, bar code depicted below represents the sequence 010001.



Bar code reader used in this problem fell on a floor and since then was unable to properly recognize a color of some 'squares' of a bar code.

Write a program that will from a given scanning of a bar code with our faulty reader determine which sequence of binary digits it represents if it is possible.

Input data

The first line of input file contains an integer N , $1 \leq N \leq 100$, representing total width of scanned bar code.

Each of next five lines contains N characters, each of which can be '**X**', '.' (*dot*) or '?' (*question mark*), where **X** represents successfully recognized black 'square', a dot represents successfully recognized white 'square' and question mark means that our reader didn't determine the colour of the 'square'.

Output data

The first and only line of output file should contain a sequence of binary digits represented with bar code given in input file if it can be determined. If a sequence cannot be determined, word '**UNDETERMINABLE**' should be written to the first line instead.

Examples

BARCODE.IN

```
4
.X??
.??
???.?
?X.?
.X?.
```

BARCODE.OUT

```
001
```

BARCODE.IN

```
8
?.?X?X??
???.X??..
?????????
?..???X..
?..X?X??
```

BARCODE.OUT

```
010001
```

BARCODE.IN

```
9
XX.?.X..?X
?.X.?.X?.?X
XX.?.X..??
X?.?.X..?X
XX.?.X?.?X
```

BARCODE.OUT

```
UNDETERMINABLE
```

MASS

A molecule can be defined as a sequence of atoms and represented by a chemical formula consisting of letters denoting these atoms. E.g. letter H denotes atom of hydrogen, C denotes atom of carbon, O denotes atom of oxygen, formula COOH represents molecule consisting of one atom of carbon, two atoms of oxygen and one atom of hydrogen.

To write some formulas efficiently, we use the following rules.

Letters denoting some atoms can be grouped by enclosing in parentheses, e.g. formula CH(OH) contains group OH. Groups can be nested – a group can also contain other groups. To simplify a formula, consecutive occurrences of the same letter can be replaced with that letter followed by a number of these occurrences. E.g. formula COOHHH can be written as CO₂H₃ and it represents a molecule consisting of one atom of carbon, two atoms of oxygen and three atoms of hydrogen.

Furthermore, consecutive occurrences of the same group can be replaced with that group followed by a number of these occurrences. E.g. formula CH (CO₂H) (CO₂H) (CO₂H) can be written as CH(CO₂H)₃ and molecule represented by both those formulas consists of four atoms of carbon, four atoms of hydrogen and six atoms of oxygen.

A number written after a letter or a group is always greater than or equal to 2 and less than or equal to 9.

A mass of a molecule is a sum of masses of all its atoms. One atom of hydrogen has mass 1, one atom of carbon has mass 12 and one atom of oxygen has mass 16.

Write a program that will calculate a mass of a molecule.

Input data

The first and only line of input file contains a formula of a molecule whose mass needs to be determined. A formula of a molecule will consist of characters **H, C, O, (,) , 2, 3, ..., 9** only. Its length will be less or equal to 100 characters.

Output data

The first and only line of output file should contain a mass of a molecule represented with a given formula. The result will always be less than or equal to 10,000.

Examples

MASS.IN	MASS.IN	MASS.IN
COOH	CH (CO ₂ H) ₃	((CH) ₂ (OH ₂ H)(C(H))O) ₃
MASS.OUT	MASS.OUT	MASS.OUT
45	148	222