



Section No.	01	Section Name	Coding for Product Development Companies
Q Paper No.	06	Topic Name	Functions
Total Marks	30	Time Limit	90 minutes

Q.1) Bacterial Problem

You are a lover of bacteria. You want to raise some bacteria in a box.

Initially, the box is empty. Each morning, you can put any number of bacteria into the box. And each night, every bacterium in the box will split into two bacteria. You hope to see exactly x bacteria in the box at some moment.

What is the minimum number of bacteria you need to put into the box across those days

Input

The only line containing one integer x ($1 \leq x \leq 10^9$).

Output

The only line containing one integer: the answer.

Examples

input1

5

output1

2

input2

8

output2

1

Note

For the first sample, we can add one bacterium in the box in the first day morning and at the third morning there will be 4 bacteria in the box. Now we put one more resulting 5 in the box. We added 2 bacteria in the process so the answer is 2.

For the second sample, we can put one in the first morning and in the 4-th morning there will be 8 in the box. So the answer is 1.



Q.2) N Queen Problem

The N Queen is the problem of placing N chess queens on an N×N chessboard so that no two queens attack each other.

For example, following is a solution for 4 Queen Problem.

```
0 1 0 0
0 0 0 1
1 0 0 0
0 0 1 0
```

Where 1s are the locations of the queens for N=4 Problem

Given an 'N' output the number of N-Queen solutions possible, if none print "Solution does not exist".

Constraint

$1 \leq N \leq 10$

Sample input

4

Sample output

2

Explanation:

1-

```
0 0 1 0
1 0 0 0
0 0 0 1
0 1 0 0
```

2-

```
0 1 0 0
0 0 0 1
1 0 0 0
0 0 1 0
```

Are the two possible outcomes



Q.3) Say Crypto

Write a code to accept an integer N and then N number of sentences from the user and reverse its each word and swap even indexed words to next placed word. If number of words is odd then last word is not swapped.

Constraints

$1 \leq N \leq 10$

$1 \leq \text{length of sentences} \leq 100$

$1 \leq \text{number of words} \leq 10$

Input Format

Number of testcases in first line then N number of testcases follows

Output Format

Expected outputs for each testcase in different line

Sample Input

2

good morning everyone

hackerrank custom challenges for every one

Sample Output

gninrom doog enoyreve

motsuc knarrekcah rof segnellahc eno yreve

Explanation

Output is self-explanatory

#notes

Reading a sentence is confirmed, string operations are confirmed