



Greetings From Globussoft

- ❖ Given below are 5 Programming questions, you have to solve any 3 out of 5 questions.
- ❖ These 5 questions you can attempt in any technology like C/C++, java, .Net, PHP
- ❖ To solve these 3 questions you've max. 3 hours.
- ❖ While Solving these questions you are not allowed to use any Search Engine like Google, Yahoo, Bing ...

All the best for your test

Globussoft

QUESTION - 1

In a recent programming contest appeared a problem named “File Recover”. In that problem, repeated strings of a given text were to be counted. You are preparing test cases for that problem, and in order to test for border cases you want to generate a text with many repetitions of a particular string.

Of course, test cases cannot be arbitrarily long, so you decided to choose a length and a string, and then fit in a text of that length as many repetitions as possible of the string.

For instance, if the length is 14 and the string is “abcb”, you may generate the text “abcbabcbabcb” whose length is 14 and where the string “abcb” appears 4 times (starting at positions 1, 4, 7 and 10).

You would like to know how good your idea is before implementing. Given a length and a string, you must determine the maximum number of times the characters of the string can appear consecutively in a text of that length.

Input

Each test case is described using a single line. The line contains an integer K ($1 \leq K \leq 10^9$) and a non-empty string S of at most 10^6 lowercase letters. The end of input is indicated with a line containing the number -1 and an asterisk (“*”).

Output

For each test case, output a single line with a single integer representing the maximum number of times the characters of S can appear consecutively in a text of length K .

Example

Input :

```
14 abcb
1000 abcde
1000000000 z
1 zzzzz
-1 *
```

Output :

```
4
200
1000000000
0
```

QUESTION – 2

There are G girl students and B boy students in a class that is about to graduate. You need to arrange them in a single row for the graduation. To give a better impression of diversity, you want to avoid having too many girls or too many boys seating consecutively.

You decided to arrange the students in order to minimize the gender regularity. The gender regularity of an arrangement is the maximum number of students of the same gender (all girls or all boys) that appear consecutively. Given G and B , calculate the minimum gender regularity among all possible arrangements.

Input

Each test case is described using a single line. The line contains two integers G and B representing the number of girls and boys in the class, respectively ($0 \leq G, B \leq 1000$). The end of input is indicated with a line containing the number -1 twice.

Output

For each test case, output a single line with a single integer representing the minimum gender regularity that an arrangement of G girls and B boys can have.

Example

Input :

```
10 10
5 1
0 1000
-1 -1
```

Output :

```
1
3
1000
```

QUESTION – 3

Daniel marked a point on a plane with sympathetic ink and he has also drawn a regular n -gon with normal ink. Max can see the n -gon, but can't see the point. Max can draw a line and ask Daniel which side of the line the point is. What is the minimum number of questions Max have to ask to define if the point is inside the n -gon in the worst case?

Input

First line of the input contains number t - the amount of test cases. Each test consists of the single integer n - the amount of sides of the n -gon.

Constraints

$1 \leq t \leq 100$
 $3 \leq n \leq 1000000$

Output

For each test case print a single number - the answer to the question in the statement.

Example

Input:

1
4

Output:

3

QUESTION – 4

If you are travelling a lot you could have met the following problem: different countries use different measurement systems. Notably there are two major measurement systems for distances: metric and imperial. Metric system exploits kilometers while miles are used in the imperial system. It is known that one mile is approximately 1.609 kilometers. By interesting coincidence this is close enough to the value of the golden ratio which is about 1.618. On this basis there is an interesting way of converting miles to kilometers. Let's look into Fibonacci sequence: $F_1 = F_2 = 1$, $F_n = F_{n-1} + F_{n-2}$, для $n > 2$. The ratio of two successive Fibonacci numbers F_{n+1}/F_n tends to golden ratio as n tends to infinity. So you can partition the amount of miles you have into Fibonacci numbers, and you should use as large Fibonacci numbers as possible, then for each element in the partition you should go to the next Fibonacci number and sum up the elements again. That way you will get the approximate amount of kilometers. For example, $40 \Rightarrow 34 + 5 + 1 \Rightarrow 55 + 8 + 2 \Rightarrow 65$. That means that 40 miles is approximately 65 kilometers (more precise value is 64,37 kilometers). Write a program that implements this method.

Input

The first line of input contains number t – the amount of test cases. The description of t test cases follows. Each test consists of a single integer m - the amount of miles.

Constraints

$1 \leq t \leq 10000$
 $1 \leq m \leq 10^{15}$

Output

For each test case output the amount of kilometers calculated using the method given in the statement.

Example

Input :

4
1
7
40
128

Output :

2
11
65
207

QUESTION – 5

Zvonkec is yet another programmer employed in a small company. Every day he has to refactor one file of source code. Much to his dismay, the source is usually far from being clear and tidy. He is especially bothered by uneven indentation, i.e. the number of tabulators (tabs) indenting each line.

Fortunately, his editor has a command to select a group of consecutive lines and add or delete a character from the start of each one. Help Zvonkec tidy up the code as quickly as possible.

You are given the number of lines N , a sequence specifying the current number of tabs at the start of each line, and a sequence specifying the required number of tabs at the start of each line.

Zvonkec can execute any number of commands consisting of:

- selecting any number of consecutive lines
- adding or deleting a single tab to/from the front of each of the selected lines

The two actions above comprise a single command, regardless of the number of selected lines. It should be noted that it is forbidden to delete more tabs from a line than are actually present at the start of a line, as the editor would start deleting characters other than tabs.

You are asked to calculate the minimum number of commands required to tidy up the code.

Input

The first line of input contains a positive integer N ($N \leq 1000$).

The second line contains a sequence of N integers P_i ($0 \leq P_i \leq 80$), specifying the number of tabs at the start of i -th line before any editing.

The third line contains a sequence of N integers K_i ($0 \leq K_i \leq 80$), specifying the number of tabs that Zvonkec would like at the start of i -th line.

Output

The first and only line of output must contain the required number, as specified in the problem statement.

Example

Input:

```
3
3 4 5
6 7 8
```

Output:

```
3
```

Input:

```
4
1 2 3 4
3 1 1 0
```

Output:

```
6
```

Input:

```
4
5 4 5 5
1 5 0 1
```

Output:

```
10
```