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

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QUESTION - 1

You are developing a visual component for a web browser. The component is known as textarea, and its main functionality is to show a given text using one or more lines. Every textarea has a linewidth W , which is the number of characters that can fit in a single line.
The text that needs to be shown is a sequence of words. The textarea must display the text using lines of W characters, without breaking any word, and placing a single space between each pair of consecutive words that are in the same line. Any number of trailing spaces may be left at the end of each line. So the behavior of the textarea is quite simple: it keeps adding words to a line until the next word does not fit; each time this occurs, a new line is started.
With the permanent growing in the amount of information that web pages must show, you have to make a smart textarea that uses as little space as possible, even when dealing with very long texts. Given a text to show and a number of lines L, you must set the linewidth W to the minimum possible value such that the text is shown using at most L lines.

Input

The input contains several test cases, each one described in exactly two lines. The first line of each test case contains two integers L and N separated by a single space, where L is the maximum number of lines the textarea can have ($1 \leq L \leq 10^8$), and N is the number of words the text to show is made of ($1 \leq N \leq 10^5$). The second line contains the text to show, formed by N non-empty words of at most 25 lowercase letters each, separated by an arbitrary number of spaces. The last line of the input contains the number −1 twice separated by a single space and should not be processed as a test case.

Output

For each test case output a single line with an integer W representing the minimum linewidth such that the textarea has at most L lines.

Example

Input:
```
1 2
hello     word
2 2
racing club
-1 -1
```
Output:
```
10
6
```

QUESTION – 2

Feanor is an elf, and of course, he really likes arrows and bows. Surprisingly enough, Feanor has a laptop, but he knows nothing about programming, so he requires your help.
Feanor lives in a tower of height H, and he loves throwing arrows from the top of it. He had a good amount of intesive training and he knows that he always throws his arrows with the same initial speed V . He wants you to make a program that given H and V returns the maximum distance that a Feanor's arrow can reach when it hits the ground, measured from the base of the tower. With this information, he will be able to place a nice circular fence to prevent deoriented little elves from being killed.
Newtonian laws apply in Feanor's world and the gravity has the same strength as in ours. These laws can be summarized as follows:
• The position of Feanor is assumed to be a point. The same occurs with the position of his arrow at each moment in time.
• The initial speed V of the arrow can be expressed as $Vx^2 + Vy^2 = V^2$, where Vx and Vy are the horizontal and vertical components of V , respectively. Speed Vx is always non-negative, while speed Vy is positive if the arrow is thrown up, and negative if the arrow is thrown down.
• The initial position of the arrow is the position of Feanor.
• The horizontal position of the arrow (relative to Feanor's position) at time t is $x(t) = Vx * t$.
• The vertical position of the arrow (relative to Feanor's position) at time t is $y(t) = Vy * t - gt^2 / 2$, where $g = 9.8$ m/s2 .

Input

The input contains several test cases. Each test case is described in a single line that contains two integers V and H separated by a single space. The value V is the initial speed of Feanor's arrow measured in m/s ($0 \leq V \leq 1000$), while the value H is the tower's height in meters ($0 \leq H \leq 1000$). The last line of the input contains the number −1 twice separated by a single space and should not be processed as a test case.

Output

For each test case output a single line with the radius of Feanor's fence in meters, rounded up to 6 decimal digits (he wants to be sure that he doesn't kill those cute little elves).

Example

Input:

```
1 0
10 0
100 0
1000 0
-1 -1
```

Output:

```
0.102041
10.204082
1020.408163
102040.816327
```

QUESTION – 3

As you may know, there are currently two main sets of measurement units in the world: the metric system and the imperial system. The imperial system receives its name from the British empire, which was the place of its invention and its main user until recently. Nowadays, Britain's heir, the United States of America, is the only country where a variation of the imperial system is the official measurement system.
For a particular magnitude, in a given measurement system there are N different units U1 , U2 , . . . UN (the number of units depends on both the magnitude and the system). For every i ($1 \leq i \leq N - 1$), a certain number of Ui is equivalent to a certain number of Ui+1 . In the metric system we always have that 1Ui is equivalent to 10Ui+1 . For instance, 1 decimeter is equivalent to 10 centimeters, 1 gram is equivalent to 10 decigrams, and 1 decaliter is equivalent to 10 liters. On the contrary, in some variations of the imperial system we may have other positive integers instead of 1 and 10. For instance, 32 drams are equivalent to 875 grains.
Since you were born and raised using the much more sensible metric system, you need help learning the imperial system and its variations. You want to be able to transform directly from U1 to UN , that is, you need to know that a certain number of U1 is equivalent to a certain number of UN . To ease further calculations, you want to express the equivalence using only integers values, and these values must be as small as possible.

Input

Each test case is described using several lines. The first line contains an integer N indicating the number of units in the measurement system ($2 \leq N \leq 10$). Line i of the next $N - 1$ lines describes the relationship between units Ui and Ui+1 with two integers Ai and Bi representing that Ai Ui is equivalent to Bi Ui+1 ($1 \leq Ai < Bi \leq 100$). The end of input is indicated with a line containing a single −1.

Output

For each test case, output a single line with two positive integers C and D representing that CU1 is equivalent to DUN . If there are several alternatives, choose the minimum possible value for C.

Example

Input:
```
5
```

```
1 2
2 3
3 4
2 5
2
6 9
-1
```

Output:

```
1 10
2 3
```

QUESTION – 4

Given 3 three pegs: leftmost peg A, middle peg B and rightmost peg C.Find the shortest sequence of moves that transfers a tower of n disks from the left peg A to the right peg C, if direct moves between A and C are disallowed. (Each move must be to or from the middle peg B.)

Constraints:
1. Initially the left peg A in stacked by n disks in the order of decreasing size.
2. Only one move cand be done at a time and never moving a larger one onto a smaller.
3. Number of moves will always be less than 2^64.
4. 1 <= n <= 35

Input

Input begins with a integer t, followed by t lines. Each line has the no. of pegs n.

Output

For each test case, output the minimum no. of move required to transfer the n disks from peg A to peg C.

Example

Input:

```
4
1
2
5
10
```

Output:

```
2
8
242
59048
```

QUESTION – 5

A beehive is an enclosed structure in which some honey bee species live and raise their young. In this problem we consider a two-dimensional sketch of the beehives. Each beehive is composed of a certain number of cells, where each cell is a regular hexagon. Each cell may have some neighbors, which are other cells that share a side with that cell. A cell with exactly 6 neighbors is an internal cell, while a cell with fewer neighbors is an external one. Notice that an external cell can always be changed to internal by adding some neighbor cells.

We are interested in a particular class of beehives. This class of valid beehives is defined recursively as follows: a) a single cell is a valid beehive; and b) given a valid beehive B, if we add the minimum number of cells such that each external cell of B becomes an internal cell, the result is a valid beehive.

The number of cells in a valid beehive is called a beehive number. Given an integer N , you must decide whether it is a beehive number.

Input

Each test case is described using a single line. The line contains an integer N ($1 \leq N \leq 10^9$). The end of input is indicated with a line containing a single −1.

Output

For each test case, output a single line containing an uppercase “Y” if N is a beehive number, or an uppercase “N” otherwise.

Example

```
Input:
43
1
7
19
15
-1
Output:
N
Y
Y
Y
N
```