[ML] Broken Message

Problem ID: message

You were given a secret encoded message to deliver, but accidentally spilled water on the paper and lost part of every line in the message. You need to repair the message before anyone discovers your mistake.

Thankfully, you know that the encoding simply maps words to a number, and the original language was English. For example, the encoding map might be:

the	1
apple	2
down	3
fell	4
well	5

"`the apple fell down the well`" in this scheme would be encoded as `[1,2,4,3,1,5]`.

Unfortunately, you don't know the encoding map, but still need to find a way to write reasonable sentences. You only lost one word of each sentence, so you think you should be able fill in the missing blanks.

Write a program to determine the number representing the missing word on each line. Note that this task awards points for partial solutions as it's not possible to perfectly determine every missing word.

Input

Your program will receive input from standard input.

The first row will be a single integer n, representing the number of sentences in the message. n lines will follow, each of which contains a list of between L_{min} and L_{max} space separated integers each representing either a single word, w_i or -1 if this is the missing word. Each line will have exactly one missing word.

Output

Your program should write to standard output.

Print n lines, each with a single integer to replace the missing word.

Constraints

- $10^3 < n < 5 \cdot 10^3$
- $L_{\text{min}} = 4$
- $L_{\text{max}} = 12$
- $0 \leq w_i < 10^3$

Scoring

Points awarded for this problem is defined as

$$100 \times \frac{\min(\text{percent\_correct}, 30)}{30}$$

That is, correctly identifying 30% of the missing words awards full points, while solutions below this receive points proportionally. Scores will be rounded to the nearest integer value.

Sample Explanation

In this example, the first input is missing the 3rd word, and the 2nd input is missing its 6th word. The output suggests filling in the missing word in the first input with 6 and the missing word in the 2nd input with 4.

Sample Input 1	Sample Output 1
2 1 2 -1 5 4 1 3 2 6 5 -1	6 4