## Exchange Operations

Given a sequence of 12 numbers consisting of 0 and the first 11 natural numbers. Suppose number 0 is in the i-th position of the sequence (positions are numbered from 0 to 11). You can swap it with the number in the j-th position if the following conditions hold:

- $|\mathrm{i}-\mathrm{j}|=\mathrm{d}_{\mathrm{k}}$, where $\mathrm{k}=1 . .3$ and $\left(\mathrm{d}_{1}, \mathrm{~d}_{2}, \mathrm{~d}_{3}, \mathrm{~d}_{4}\right)=(1 ; 3 ; 6 ; 12)$
- floor $\left(\mathrm{i} / \mathrm{d}_{\mathrm{k}+1}\right)=$ floor $\left(\mathrm{j} / \mathrm{d}_{\mathrm{k}+1}\right)$

Your task is to find the minimum number of exchange operations required to sort the sequence in increasing order.

## Input

The first line of the input file contains an integer representing the number of test cases to follow. Each test case contains a sequence of twelve numbers consisting of $0,1,2, . ., 11$, separated by single space. You can assume that the given sequence can always be sorted in increasing order by using the exchange operations

## Output

For each test case, output the minimum number of exchange operations required to sort the given sequence in increasing order.

## Example

Input:
2
11023057486911
64103597210118

## Output:

8
9

