

Given a four-digit integer n , your task is to count the number of ways to make it a square number by changing exactly one digit (note that you can't change the first digit to 0). For example, if $n = 7844$, there are two ways: $3844 = 62^2$ and $7744 = 88^2$.

Input

The first line of integer contains one integer T ($1 \leq T \leq 1000$), the number of test cases. Each test case contains a single integer n ($1000 \leq n \leq 9999$).

Output

For each test case, print the case number and the number of ways to make it a square integer by changing exactly one digit.

Sample Input

```
2
7844
9121
```

Sample Output

```
Case 1: 2
Case 2: 0
```