Three-coloring of binary trees

A **tree** consists of a node and some (zero, one or two) subtrees connected to it. These subtrees are called children.

A **specification** of the tree is a sequence of digits. If the number of children in the tree is:

- zero, then the specification is a sequence with only one element '0';
- one, the specification begins with '1' followed by the specification of the child;
- two, the specification begins with '2' followed by the specification of the first child, and then by the specification of the second child.

Each of the vertices in the tree must be painted either red or green or blue.
However, we need to obey the following rules:

- the vertex and its child cannot have the same color,
- if a vertex has two children, then they must have different colors.

How many vertices may be painted green?

Task

Write a program which:

- reads the specification of the tree from the standard input,
- computes the maximal and the minimal number of vertices that may be painted green,
- writes the results in the standard output.

Input

The number of test cases t is in the first line of input, then t test cases follow in separate lines. Each test case consists of one word (no longer then 10000 characters), which is a specification of a tree.

Output

Your program should write for each test case exactly two integers separated by a single space, which respectively denote the maximal and the minimal number of vertices that may be painted green.

Example

Sample input:
1
1122002010

Sample output:
5 2