In computer science, a set is an abstract data type that can store certain values, without any particular order, and no repeated values(Wikipedia). $\{1, 2, 3\}$ is an example of a set, but $\{1, 2, 2\}$ is not a set. Today you will learn how to use sets in java by solving this problem.

You are given n pairs of strings. Two pairs (a, b) and (c, d) are identical if $a = c$ and $b = d$. That also implies (a, b) is *not* same as (b, a). After taking each pair as input, you need to print number of unique pairs you currently have.

Complete the code in the editor to solve this problem.

Input Format

In the first line, there will be an integer T denoting number of pairs. Each of the next T lines will contain two strings seperated by a single space.

Constraints:

- $1 \leq T \leq 100000$
- Length of each string is atmost 5 and will consist lower case letters only.

Output Format

Print T lines. In the i_{th} line, print number of unique pairs you have after taking i^{th} pair as input.

Sample Input

```
5
john tom
john mary
john tom
mary anna
mary anna
```

Sample Output

```
1
2
2
3
3
```

Explanation

- After taking the first input, you have only one pair: (john,tom)
- After taking the second input, you have two pairs: (john, tom) and (john, mary)
- After taking the third input, you still have two unique pairs.
- After taking the fourth input, you have three unique pairs: (john,tom), (john, mary) and (mary, anna)
- After taking the fifth input, you still have three unique pairs.