Valid or Invalid

Input file:	`standard input`
Output file:	`standard output`
Time limit:	1 second
Memory limit:	64 megabytes

CSE-222 Analysis and Design of Algorithms

Plagiarism: All submitted codes are expected to be the result of your individual effort. You should never misrepresent someone else's work as your own.In case any plagiarism case is detected you will get one grade reduction in final examination.Cite the resource wherever using other's code.

Instructions:

1)You must complete this in the lab timing only and allowed programming language are python/Java/C/C++.If have doubt about the libraries and function to use ask the TA about it.

2)You must submit your working solution on Foobar on the foobar portal page from where you have downloaded this lab instructions sheet.

3)No extensions on deadline.If you fail to submit within will not be evaluated.

4)Mention your enrollment no. and name at starting of the file along with a brief.

Problem:

Use only recursion to solve the following problem:

It's Retrace time, and you have been charged with designing a game for the alumni. After some thought, you decide to make a game using their names. First you decide to change the name into something completely new using the following rules:

Taking consecutive pairs of characters from their name, you change it as follows:

a)If the characters are **near**, that is lexicographical distance between them is at most 3, they are replaced either with 'aa' or 'bb', depending on the last assigned character. That is, if the last character assigned was 'a', the new characters are 'aa' else, 'bb'. If no character has been assigned before, they are replaced with 'aa'.

b)If the characters are far, they are replaced as per the order of their lexicographical occurrence. If they occur in ascending order, they are replaced with 'ab', else with 'ba'.

Once, you get the 'new' names of the alumnus, you decide to check whether their name is valid or not, using the following rules:
a) the name begins with an 'a'.
b) each 'a' is followed by nothing or an 'a' or "bb".
c) each "bb"is followed by nothing or an 'a'.

Input

The first line contains T ,number of test cases.
Next T lines contain an even length string containing only lowercase characters.

Output

For each testcase print the **Valid** or **Invalid**.

Example

standard input	standard output
2 AZAD AZZA	Valid Invalid

Note

Names must have at least 2 characters and length is even. If the initial 2 characters are near, then start building the string with 'aa'.
For testcase 1 string will be abbaaa For testcase 2 string will be abbbba