

Z meet

The Z-meet is an annual alumni meet of the department of Computer Science at PSG college of technology, where students of different batches meet. The batch names are named in an alphabetical order and ending with Z (hence the name Z-meet). That is Aztecz, Byzandierz, Calitz, Dextroblitz, Espritz, F5erz and Griffinxeritz. The event is held in a hall and the students are seated in random order. The event co-ordinators have a problem. They need to find the strength of attendance of the event by different batches which is calculated as follows:

1. each person in the hall shouts out a number which is calculated as $(\text{year of Z-meet} - \text{year of pass-out})^2$ if he is an alumni or $(\text{year of Z-meet} - \text{year of entering})^2$ if he is still a student. Assume the batch of the year in which Z-meet is not passed out.
2. the numbers shouted by each person in the hall are added to get the strength of attendance.

The year of passing & year of entering of the different batches are given:

Aztecz	2001-2005
Byzandiarz	2002-2006
Calitz	2003-2007
Dextroblitz	2004-2008
Espritz	2005-2009
F5erz	2006-2010
Griffinxeritz	2007-2011

for example if the event is held in 2008 the Aztecz batch member shouts $(2008-2005)^2=9$ and a Dextroblitz member shouts $(2008-2004)^2=16$

help the event co-ordinator by writing a program to find strength of attendance.

Input

There is a single positive integer T on the first line indicating the number of test cases to follow. Then there are T lines each containing a year in which Z-meet is held and a string giving the seating arrangement of the alumni and students. That is A refers to Aztecz member C refers to Calitz member and so on.

Output

For every string, output a single line containing the strength of attendance of the event.

Example

Input:

3

2008 ADECBA
2006 BABACAD
2009 BEGFADEG

Output:

48
48
75