

HOME TOP CATALOG CONTESTS GYM PROBLEMSET GROUPS RATING EDU API CALENDAR HELP

PROBLEMS SUBMIT CODE MY SUBMISSIONS STATUS HACKS STANDINGS CUSTOM INVOCATION

G. Shuffling Songs

time limit per test: 3 seconds

memory limit per test: 256 megabytes

input: standard input

output: standard output

Codeforces Round 937 (Div. 4)

Finished

Vladislav has a playlist consisting of  $n$  songs, numbered from 1 to  $n$ . Song  $i$  has genre  $g_i$  and writer  $w_i$ . He wants to make a playlist in such a way that every pair of adjacent songs either have the same writer or are from the same genre (or both). He calls such a playlist *exciting*. Both  $g_i$  and  $w_i$  are strings of length no more than  $10^4$ .

It might not always be possible to make an exciting playlist using all the songs, so the shuffling process occurs in two steps. First, some amount (possibly zero) of the songs are removed, and then the remaining songs in the playlist are rearranged to make it exciting.

Since Vladislav doesn't like when songs get removed from his playlist, he wants the making playlist to perform as few removals as possible. Help him find the minimum number of removals that need to be performed in order to be able to rearrange the rest of the songs to make the playlist exciting.

**Input**  
The first line of the input contains a single integer  $t$  ( $1 \leq t \leq 1000$ ) — the number of test cases. The description of test cases follows.

The first line of each test case contains a single integer  $n$  ( $1 \leq n \leq 16$ ) — the number of songs in the original playlist.

Then  $n$  lines follow, the  $i$ -th of which contains two strings of lowercase letters  $g_i$  and  $w_i$  ( $1 \leq |g_i|, |w_i| \leq 10^4$ ) — the genre and the writer of the  $i$ -th song. Where  $|g_i|$  and  $|w_i|$  are lengths of the strings.

The sum of  $2^n$  over all test cases does not exceed  $2^{16}$ .

The sum of  $|g_i| + |w_i|$  over all test cases does not exceed  $4 \cdot 10^5$ .

**Output**  
For each test case, output a single integer — the minimum number of removals necessary so that the resulting playlist can be made exciting.

Example

input

4  
1  
pop taylorswift  
4  
electronic themotans  
electronic carlasdreams  
pop themotans  
pop irinarimes  
7  
rap eminem  
rap drdre  
rap kanyewest  
pop taylorswift  
indierock arcticmonkeys  
indierock arcticmonkeys  
punkrock theoffspring  
4  
a b  
c d  
e f  
g h

output

→ Practice?

Want to solve the contest problems after the official contest ends? Just register for practice and you will be able to submit solutions.

Register for practice

→ Virtual participation

Virtual contest is a way to take part in past contest, as close as possible to participation on time. It is supported only ICPC mode for virtual contests. If you've seen these problems, a virtual contest is not for you - solve these problems in the archive. If you just want to solve some problem from a contest, a virtual contest is not for you - solve this problem in the archive. Never use someone else's code, read the tutorials or communicate with other person during a virtual contest.

Start virtual contest

→ Problem tags

bitmasks

dfs and similar

dp

graphs

hashing

implementation

strings

No tag edit access

→ Contest materials

Announcement (en)

Tutorial (en)

```
0
0
4
3
```

**Note**

In the first test case, the playlist is already exciting.

In the second test case, if you have the songs in the order 4, 3, 1, 2, it is exciting, so you don't need to remove any songs.

In the third test case, you can remove songs 4, 5, 6, 7. Then the playlist with songs in the order 1, 2, 3 is exciting.

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