

Problem B. Balanced Sequence

Input file: *standard input*
 Output file: *standard output*
 Time limit: 1 second
 Memory limit: 256 mebibytes

Chiaki has n strings $s_1, s_2, \dots, s_n$ consisting of '(' and ')'. A string of this type is said to be *balanced*:

- if it is the empty string
- if A and B are balanced, AB is balanced,
- if A is balanced, (A) is balanced.

Chiaki can reorder the strings and then concatenate them get a new string t . Let $f(t)$ be the length of the longest balanced subsequence (not necessary continuous) of t . Chiaki would like to know the maximum value of $f(t)$ for all possible t .

Input

There are multiple test cases. The first line of input contains an integer T , indicating the number of test cases. For each test case:

The first line contains an integer n ($1 \leq n \leq 10^5$) – the number of strings.

Each of the next n lines contains a string s_i ($1 \leq |s_i| \leq 10^5$) consisting of '(' and ')'. It is guaranteed that the sum of all $|s_i|$ does not exceeds 5×10^6 .

Output

For each test case, output an integer denoting the answer.

Example

standard input	standard output
2	4
1	2
)()() (	
2	
)	
) (	