

Parentheses and Swapping

Input file: **standard input**
Output file: **standard output**
Time limit: 1 second
Memory limit: 1024 megabytes

A parentheses sequence is a string composed of the characters (and). A parentheses sequence $s_{1,2,\dots,m}$ is defined as valid if it satisfies one of the following conditions:

- s is empty.
- $s_1 = (, s_m =)$, and $s_{2,3,\dots,m-1}$ is valid.
- There exists a position $k(1 \leq k < n)$ such that $s_{1,2,\dots,k}$ is valid, and $s_{k+1,k+2,\dots,m}$ is valid.

Two positions $i, j(1 \leq i < j \leq m)$ in the parentheses sequence $s_{1,2,\dots,m}$ are said to be matched if and only if both $s_{i,i+1,\dots,j}$ and $s_{i+1,i+2,\dots,j-1}$ are valid.

Given an integer sequence of length n, a_1, a_2, \dots, a_n , where n is guaranteed to be even. We construct a new integer sequence c_1, c_2, \dots, c_n through a valid parentheses sequence b_1, b_2, \dots, b_n , such that $\forall 1 \leq i \leq n, c_i = a_{p_i}$, where p_i is the position matched with position i in $b_{1,2,\dots,n}$.

Find a valid parentheses sequence $b_{1,2,\dots,n}$ such that the lexicographical order of $c_{1,2,\dots,n}$ is minimized. If there are multiple solutions, output any one of them.

Input

The first line contains an integer $T(1 \leq T \leq 2.5 \times 10^5)$, indicating the number of test cases.

For each test case:

The first line contains an integer $n(1 \leq n \leq 5 \times 10^5)$, indicating the length of the sequence a , and it is guaranteed that n is even.

The second line contains n space-separated integers, representing $a_1, a_2, \dots, a_n(1 \leq a_i \leq n)$.

It is guaranteed that the sum of n does not exceed 5×10^5 .

Output

For each test case, output a line containing a string of length n , representing $b_{1,2,\dots,n}$.

Example

standard input	standard output
5	((()))
6	()()
4 1 5 4 1 1	((()))
4	()
1 2 3 2	((()))()
4	
1 3 1 2	
2	
2 1	
8	
8 5 2 6 1 4 3 7	