Hamilton (hamilton)

Memory limit: 512 MB Time limit: 1.00 s

Tracker Smurf is planning his trip for next holidays. He wants to spend **exactly** one night in each of the villages in SmurfLand. His trip can start and end in any village. Villages in SmurfLand are connected by roads in such a way that there's exactly one path between any two villages. The distance between any two directly connected villages is exactly one kilometer. Tracker is so fast that he can travel **up to three** kilometers each day, but he is still not sure if that's enough to be able to spend a night in each village exactly once. Help him find the answer.

Input

First line of input contains an integer n ($1 \leq n \leq 10^5$) – the number of villages in SmurfLand.
The next $n-1$ lines describe the roads – i-th input line ($i \in \{2, \ldots, n\}$) contains an integer p_i ($1 \leq p_i < i$) which means that there is a road connecting villages i and p_i.

Output

On a single line output n integers $q_1, q_2, \ldots, q_n$ ($1 \leq q_i \leq n$) specifying the sequence of villages for Tracker to spend the nights in (Tracker starts in village q_1 then goes to village q_2 and so on, finishing in village q_n). If it is not possible to plan Tracker's trip then on a single line output the word `NO`.

Example

Input	Output
8	1
1	3
2	5
3	6
4	7
4	8
4	4
7	2