Shortcut on Tree

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	1024 megabytes

You are given a directed tree with n vertices, where each vertex is numbered from 1 to n. The tree is rooted at vertex 1, and it is guaranteed that all vertices are reachable from the root. For each $2 \le i \le n$, the tree has a directed edge from vertex p_i to vertex i.

Little Cyan Fish wants to add up to n additional directed edges to this graph to make the following condition satisfied:

- For any pair of different integers (u, v) such that $1 \le u \le n$ and $1 \le v \le n$, it is possible to go from vertex u to vertex v using at most 4 edges.

Help Little Cyan Fish to find a possible way to add the edges.

Input

There are multiple test cases in a single test file. The first line of the input contains an integer T ($T \ge 1$) indicating the number of test cases. For each test case:

The first line of the input contains a single integer n ($n \ge 2$).

The next line of the input contains $n-1$ integers $p_2, p_3, \ldots, p_n$ ($1 \le p_i < i$), indicating the parent of each vertex $2 \le i \le n$.

It is guaranteed that the sum of n over all test cases does not exceed 4 000.

Output

For each test case, if it is impossible to add at most n edges to satisfy Little Cyan Fish's requirement, output a single line containing a single word "`No`".

Otherwise, the first line of the output contains a single word "`Yes`".

The next line of the output contains the number of added edges m ($0 \le m \le n$). The next m lines each describe one added edge as two integers u_i and v_i ($1 \le u_i, v_i \le n$) — the start and end of the i-th added edge.

Example

standard input	standard output
2 3 1 2 5 1 1 2 2	Yes 1 3 1 Yes 5 1 4 4 1 3 3 3 1 5 2

Note

In the first test case, you can satisfy the condition in the problem by adding an edge from vertex 3 to vertex 1.