Problem B: Find the depth

Time Limit: 1 Sec Memory Limit: 128 MB
Submit: 615 Solved: 194
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Description

Given a tree with N nodes and N-1 edges, the length of each edge is 1, the root of the tree is node 1, please find the depth of all nodes. the depth for node 1 is 0.

Input

The first line will be a integer T ($1 \le T \le 10$)
, which is the number of test cases.
For each test data:
The first line contains an integer N ($1 \le N \le 10^5$)
— the number of nodes.
the next N-1 lines contain two integers a and b ($1 \le a, b \le N$)
, which means there is an edge between node a and b.

Output

For each case, print one line with N integers, the i-th integer indicates the depth of node i.

Sample Input

```
1
4
1 2
1 3
4 2
```

Sample Output

```
0 1 1 2
```

HINT

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