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\* Definition for a binary tree node.

\* struct TreeNode {

\* int val;

\* TreeNode \*left;

\* TreeNode \*right;

\* TreeNode(int x) : val(x), left(NULL), right(NULL) {}

\* };

\*/

class Solution {

public:

class Pair{

public:

int height;

int diameter;

};

Pair findDiameter(TreeNode \*root){

Pair p;

if(root==NULL){

p.diameter=p.height=0;

return p;

}

Pair left=findDiameter(root->left);

Pair right=findDiameter(root->right);

p.height=max(left.height,right.height)+1;

p.diameter=max(left.height+right.height,max(left.diameter,right.diameter));

return p;

}

int diameterOfBinaryTree(TreeNode\* root) {

Pair p=findDiameter(root);

return p.diameter;

}

};