January 2023 CSE 208
Practice on Graph Traversal

Time: 45 minutes

Subsection : A1 & B1

You are given a tree. Remember, a tree is an undirected graph in which any two vertices are connected by exactly one path. You have to find out the longest path (the diameter) in that tree.

You have to do it in $O(n)$ time complexity.

Hint: You may need two BFS/DFS.

Input

You have to take input from a file named input.txt

The first line of the input contains one integer n, ($1 \leq n \leq 1e5$) — the number of nodes in the tree.

Next $n-1$ line of the input contains two integers x, y ($0 \leq x \leq n-1$, $0 \leq y \leq n-1$) and ($x \neq y$) — there is an edge between x and y.

Output

On the first line, print an integer l — the length of the path.

On the second line, print $l+1$ integers — the path.

Sample I/O

Case # 1

Input File

```
4
0 1
0 2
0 3
```

Output

```
2
1 0 2
```

Case # 2

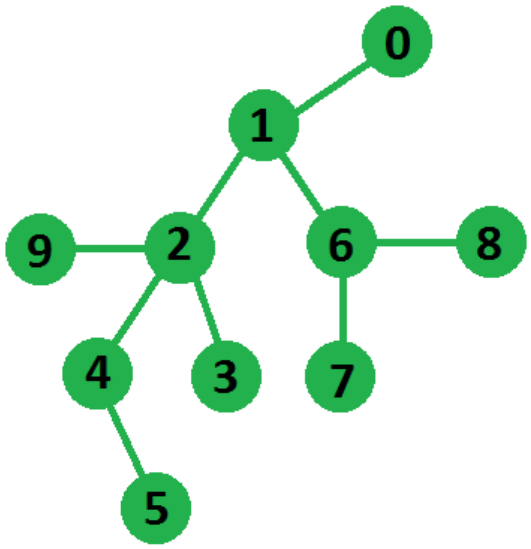
Input File

```
10
0 1
1 2
1 6
2 9
2 4
2 3
4 5
6 7
6 8
```

Output

```
5
5 4 2 1 6 8
```

Explanation of case # 2



Submission

1. Create a directory with your 7-digit student id as its name.
2. Put all the source files only into the directory created in step 1.
3. Zip the directory (compress in .zip format. Any other format like .rar, .7z etc. are not acceptable).
4. Upload the .zip file in moodle.

Special Instructions

Please note that any usage of the internet is strictly prohibited during the assignment. Usage of any unfair means will be duly punished.