

# Problem 1377: Frog Position After T Seconds

## Problem Information

**Difficulty:** Hard

**Acceptance Rate:** 36.93%

**Paid Only:** No

**Tags:** Tree, Depth-First Search, Breadth-First Search, Graph

## Problem Description

Given an undirected tree consisting of  $n$  vertices numbered from  $1$  to  $n$ . A frog starts jumping from **vertex 1**. In one second, the frog jumps from its current vertex to another **unvisited** vertex if they are directly connected. The frog can not jump back to a visited vertex. In case the frog can jump to several vertices, it jumps randomly to one of them with the same probability. Otherwise, when the frog can not jump to any unvisited vertex, it jumps forever on the same vertex.

The edges of the undirected tree are given in the array `edges`, where `edges[i] = [ai, bi]` means that exists an edge connecting the vertices `ai` and `bi`.

\_Return the probability that after  $t$  seconds the frog is on the vertex `target`. \_Answers within  $10^{-5}$  of the actual answer will be accepted.

**Example 1:**



**Input:**  $n = 7$ ,  $edges = [[1,2],[1,3],[1,7],[2,4],[2,6],[3,5]]$ ,  $t = 2$ ,  $target = 4$  **Output:** 0.16666666666666666 **Explanation:** The figure above shows the given graph. The frog starts at vertex 1, jumping with  $1/3$  probability to the vertex 2 after **second 1** and then jumping with  $1/2$  probability to vertex 4 after **second 2**. Thus the probability for the frog is on the vertex 4 after 2 seconds is  $1/3 * 1/2 = 1/6 = 0.16666666666666666$ .

**Example 2:**



**\*\*Input:\*\***  $n = 7$ ,  $edges = [[1,2],[1,3],[1,7],[2,4],[2,6],[3,5]]$ ,  $t = 1$ ,  $target = 7$  **\*\*Output:\*\***  
0.3333333333333333 **\*\*Explanation:\*\*** The figure above shows the given graph. The frog starts at vertex 1, jumping with  $1/3 = 0.3333333333333333$  probability to the vertex 7 after **\*\*second 1\*\***.

**\*\*Constraints:\*\***

$1 \leq n \leq 100$   $edges.length == n - 1$   $edges[i].length == 2$   $1 \leq a_i, b_i \leq n$   $1 \leq t \leq 50$   $1 \leq target \leq n$

## Code Snippets

### C++:

```
class Solution {
public:
    double frogPosition(int n, vector<vector<int>>& edges, int t, int target) {

    }
};
```

### Java:

```
class Solution {
    public double frogPosition(int n, int[][] edges, int t, int target) {

    }
}
```

### Python3:

```
class Solution:
    def frogPosition(self, n: int, edges: List[List[int]], t: int, target: int)
    -> float:
```