

Decorate The Tree

Assume Root as Level 0 and its neighbours as Level 1 and Level 1 neighbours as Level 2 and so on.

- **Ways to color Level 0**
 - We have K choices to color it
- **Ways to color Level 1**
 - Ways to fill the 1st neighbour is equal to K-1 [bcoz it can't become equal to Parent]
 - Ways to fill the 2nd neighbour is equal to K-2 [bcoz it can't become equal to Parent and 1st neighbour]
 - Ways to fill the 3rd neighbour is equal to k-3[can't be equal to Parent,1st and 2nd neighbour]
 - And so on.....
- **At levels greater than L>1**
 - Ways to color **ith node** would **$K-(i-1)-2$** bcoz it can't have its color equal to its **parent at Level L-1** and its **Parent's parent at Level L-2 and previous i-1 nodes** over which we have already traversed.

So multiplication of all these values would be the answer.

[Image Link](#) better explanation

Note:-Dotted lines represent level not the edges

[C++ Implementation](#)