1) **Approach**

I use Greedy Tree-map: duplication-**allowed** area-optimal mapping for tree.

In the Greedy packing procedure, each iteration I try to add the LUTi in the LUT[current_node] if it is K-feasible which is duplication-allowed and can lead to better solution than duplication-free.

And the rest of part is the same.

2) **Time Complexity Analysis**

Topological Sort: $O(V+E)$

Mapping: each node need $O(\max\{K, \log V\})$, and there is V nodes in the topo_Stack.

Thus, the complexity of mapping is $O(\max\{K, \log V\}V)$.

Total Time complexity is **$O(\max\{K, \log V\}V)$**.