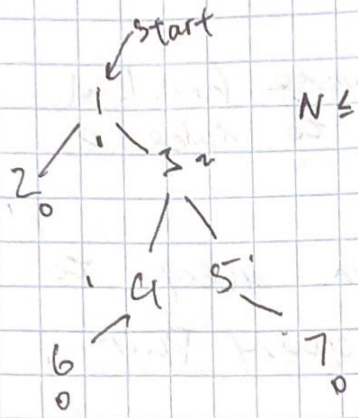
22 Nov 2020 contest #11 xjoi 1634

1. flood fill type thing (until hit edge w/ w > k)

process queries in log N

2.

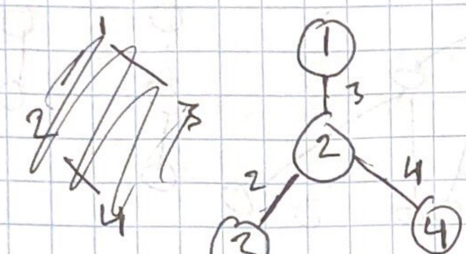


$N \le 10^5$ → binary search? how to simulate in log N? or binary lifting?

later: plan: flood fill, find degree of largest hub where a hub is anywhere that is closer to k than it's closest leaf node

3. math... PIE?

→ 1.



PST? prefix sum of frequency on edges...

Could try to re-root like rootless?

Store 2^kth ancestor min edge?

and pst of presum of freq?

maybe run kruskal and check connected component sizes

→ then you can do it offline...

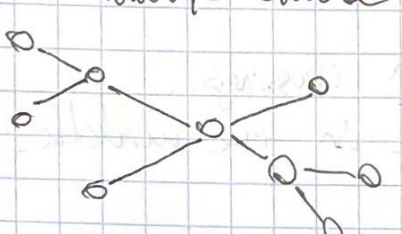
sort Pair<query, qidx>

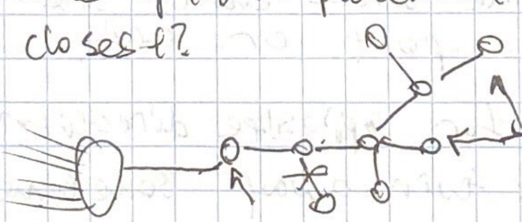
for each query, ans[q.s] = djs[find(q.f.s)]

just need to sort N edges.

#2: how to determine optimal placement?

always choose closest?

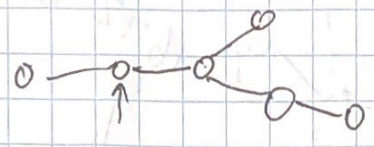




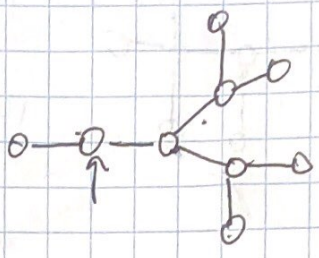
either results in bessie getting caught but closer can be better but not worse?

cont #2

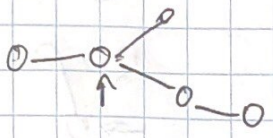
when is it possible for bessie to escape? multiple branches from start?



need: 2



need: 3



need: 3

if the tree is a star

then # needed = degree of start node? if bessie starts at the center of the star

what to do if there are more branches? each movement requires recalculation?

maybe it's the maximum degree node she can get to w/o getting caught. bc if she can get to such a node, then she has that many directions to choose from and can get out if no cops are already there bc they will bunch up there while chasing.

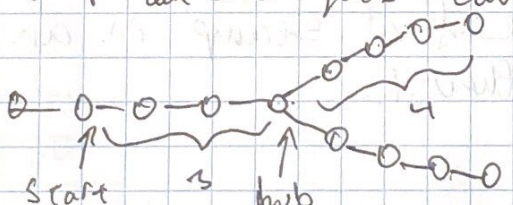
for any node, store the maximum degree node she can get to w/o getting caught?

oh wait a sec there's only one query

the question is: how to calculate? maybe find the closest leaf node to each node then find dist from node to k?

for each "hub", it takes however long (closest leaf) to get there and if bessie is closer than it works?

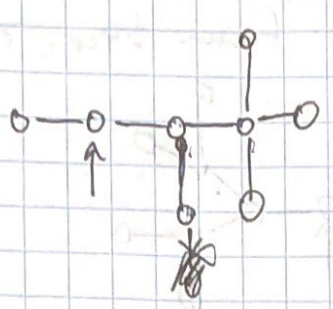
what if she gets caught along the way?

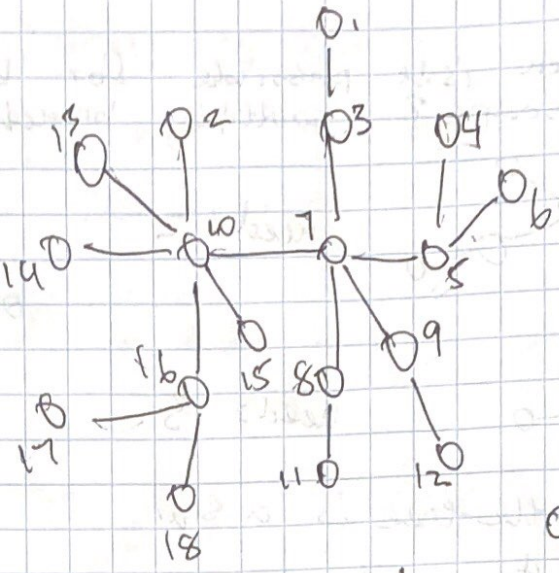


4 > 3 means it's a legal hub

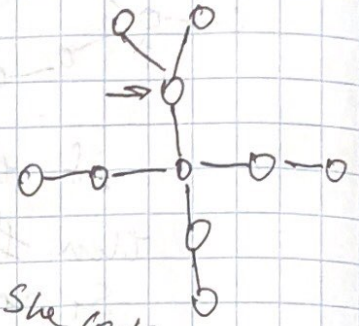
Path has to be comprised of legal hubs too?

Level #2 debugging





BREAKS!



#5 Stamp painting

N length

K width of each stamp

M colors

every column could be different... so we only care about placing stamps as close to each other as poss.ble

so it's $M^{(N-K+1)}$? fastpow

because she could leave earlier (before getting to max deg)

wait no, cuz the last stamp could go anywhere...

maybe any sequence is poss.ble, then you place the last stamp somewhere $M^{(n-k)} * M^{(N-k)}$

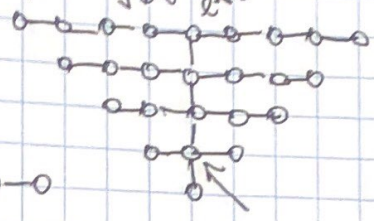
but then there are duplicates: AAA would be counted twice

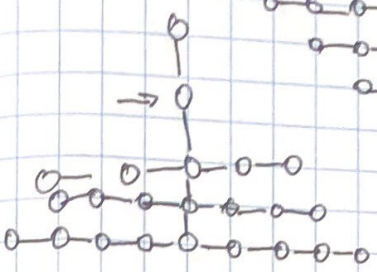
maybe dp? dp[i][j] = # of ways to paint first i w/ last color being j, and you can't use the same stamp twice in a row (but you can skip some rows)

that still doesn't allow the final stamp in an arbitrary location though...

count #2

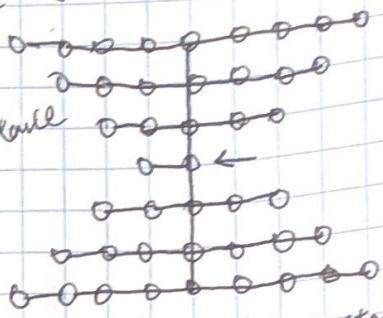
a farmer is reached at every single leaf

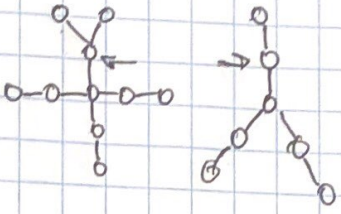




so the answer is 4 even though the max degree of any node is 4.

manhatten distance by perbola



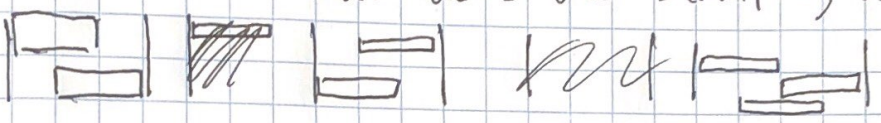


Problem arises when multiple hubs contrib.. maybe subtract two with each passing hub? what if they go in diff directions then hubs that aren't on the route still count towards the sum

maybe it's the start + (all other (hubs - 2))?

because for all other hubs, ~~you~~ he/she has to enter then leave but not for the begin and end points?

#3 so now... how does the stamping work?

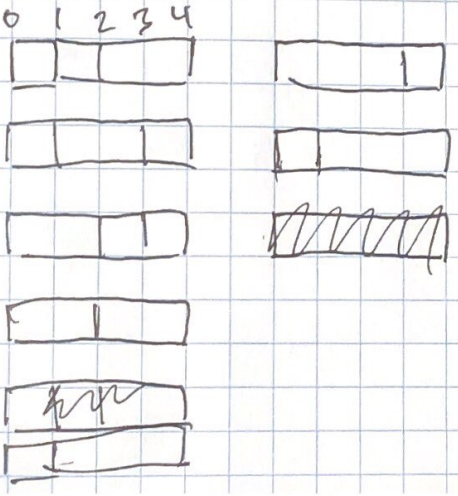


double counted

A A A A A A A A A A A A

A A A A any position could have been the last

# of possible locations
= # of consecutive − K + 1



dp on number of partitions per line count

enumerate possible line counts