DOMINATING SET

$dp[u][0] = 1$ ROOT IN THE SET

$dp[u][1] = 1$ ROOT NOT IN THE SET BUT COVERED BY CHILDREN

$dp[u][2] = 1$ ROOT NOT IN THE SET AND STILL TO BE COVERED

THEN, GOING FROM LEAVES UP ↑

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for L in reverse(layers):
    for u in L:
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$$dp[u][0] = \prod_{v \in children(u)} \left(dp[v][0] + dp[v][1] + dp[v][2] \right)$$

$$dp[u][1] = \prod_{v \in children(u)} \left(dp[v][0] + dp[v][1] \right) - \prod_{v \in children(u)} dp[u][1]$$

$$dp[u][2] = \prod_{v \in children(u)} \left(dp[v][1] \right)$$

COMPLEXITY : $O(n)$