Analysis: Fairland

We need to find a salary X such that all salaries at the company are between X and X+D, and the number of remaining employees is maximized.

If employee i is kept, then X must be in the interval $[S_i-D, S_i]$. Not only that, but X must be in the interval $[S_j-D, S_j]$ for each employee j who is the manager of employee i, or the manager of the manager of employee i, and so forth. So for each employee, we want to find the intersection of all those intervals. This is easily done using a preorder traversal of the tree, computing the intersection of all the intervals in the path from the root node to the current node. (If the intersection is empty, we can't keep that employee.)

Now we want to find the maximum number of intervals that overlap at any point. Let the interval we get for employee i be $[A_i, B_i]$. Create an array of pairs of integers, with two pairs for each employee: one containing $(A_i, +1)$ and the other containing $(B_i, -1)$. Sort this array by the first numbers of the pairs, breaking ties using the second number, by putting entries with +1 before those with -1. Then we start a counter at zero, and iterate through the array in sorted order. Add the second number of each pair to the counter. The maximum value of the counter is the answer to the problem.