

## Problem 4: Active Directory

The problem was addressed firstly by considering that it was specifically asked for “writing a function” and that there is a given Group class which is a premise and will not be changed even considering that it could be more efficiently implemented.

The algorithm input  $n$  will correspond to the entire set of groups and users the algorithm must look at.

The problem is solved with a quite simple approach by recursively traversing the groups and their lists of users and groups. Since the search algorithm looks for the required information in Python lists (not ordered ones) the time complexity is  $O(n)$  in the worst case.

Regarding space complexity each recursive function call needs some control registers that are stacked on top of each other. The worst case will be  $O(n)$  for a nested list of groups in the input.