

# Active\_Directory\_Explanation

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## 0.1 Problem Statement

This problem is concerned on the presence of a user in a group. The said group can contain other groups which contain users.

### 0.1.1 Design Considerations

The function `is_user_in_group` returns `True` or `False` depending on the presence or absence of user respectively. Since it is impossible to know the depth of groups and still imperative to search all groups this function implemented in a recursive manner.

### 0.1.2 Space and Time complexity

Since this is a recursive function inside a for loop the time complexity becomes  $O(2^n)$ .

Space complexity is  $O(1)$  since no new data structure is added and we are not considering the input data.