AlgoExpert Quad Layout C++ 12px Sublime Monokai 00:00:00

Prompt Scratchpad Our Solution(s) Video Explanation Run Code

Solution 1

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```
1\, // Copyright @ 2020 AlgoExpert, LLC. All rights reserved.
   using namespace std;
 5 class OrgChart {
 6 public:
     vector<OrgChart *> directReports;
10
     OrgChart(char name) {
11
       this->name = name;
12
       this->directReports = {};
13
14
15
      void addDirectReports(vector<OrgChart *> directReports);
16 };
17
18 struct OrgInfo {
     OrgChart *lowestCommonManager;
19
20
      int numImportantReports;
21 };
22
23 OrgInfo getOrgInfo(OrgChart *manager, OrgChart *reportOne, OrgChart *reportTwo);
24
25
   // O(n) time \mid O(d) space - where n is the number of people
^{26} // in the org and d is the depth (height) of the org chart
27 OrgChart *getLowestCommonManager(OrgChart *topManager, OrgChart *reportOne,
                                    OrgChart *reportTwo) {
29
      return getOrgInfo(topManager, reportOne, reportTwo).lowestCommonManager;
30 }
31
32 OrgInfo getOrgInfo(OrgChart *manager, OrgChart *reportOne,
                      OrgChart *reportTwo) {
33
      int numImportantReports = 0;
34
      for (OrgChart *directReport : manager->directReports) {
35
       OrgInfo orgInfo = getOrgInfo(directReport, reportOne, reportTwo);
36
37
        if (orgInfo.lowestCommonManager != NULL)
         return orgInfo;
38
39
        numImportantReports += orgInfo.numImportantReports;
40
      if (manager == reportOne || manager == reportTwo)
41
       numImportantReports++;
      OrgChart *lowestCommonManager = numImportantReports == 2 ? manager : NULL;
43
      OrgInfo newOrgInfo = {lowestCommonManager, numImportantReports};
      return newOrgInfo;
46 }
```