

Solution 1

```
1 // Copyright © 2020 AlgoExpert, LLC. All rights reserved.
2
3 using System.Collections.Generic;
4
5 public class Program {
6     // O(n) time | O(d) space - where n is the number of people
7     // in the org and d is the depth (height) of the org chart
8     public static OrgChart GetLowestCommonManager(OrgChart topManager, OrgChart reportOne,
9         OrgChart reportTwo) {
10         return getOrgInfo(topManager, reportOne, reportTwo).lowestCommonManager;
11     }
12
13     public static OrgInfo getOrgInfo(OrgChart manager, OrgChart reportOne, OrgChart reportTwo) {
14         int numImportantReports = 0;
15         foreach (OrgChart directReport in manager.directReports) {
16             OrgInfo orgInfo = getOrgInfo(directReport, reportOne, reportTwo);
17             if (orgInfo.lowestCommonManager != null) return orgInfo;
18             numImportantReports += orgInfo.numImportantReports;
19         }
20         if (manager == reportOne || manager == reportTwo) numImportantReports++;
21         OrgChart lowestCommonManager = numImportantReports == 2 ? manager : null;
22         OrgInfo newOrgInfo = new OrgInfo(lowestCommonManager, numImportantReports);
23         return newOrgInfo;
24     }
25
26     public class OrgChart {
27         public char name;
28         public List<OrgChart> directReports;
29
30         public OrgChart(char name) {
31             this.name = name;
32             this.directReports = new List<OrgChart>();
33         }
34
35         // This method is for testing only.
36         public void addDirectReports(OrgChart[] directReports) {
37             foreach (OrgChart directReport in directReports) {
38                 this.directReports.Add(directReport);
39             }
40         }
41     }
42
43     public class OrgInfo {
44         public OrgChart lowestCommonManager;
45         public int numImportantReports;
46
47         public OrgInfo(OrgChart lowestCommonManager, int numImportantReports) {
48             this.lowestCommonManager = lowestCommonManager;
49             this.numImportantReports = numImportantReports;
50         }
51     }
52 }
53
```