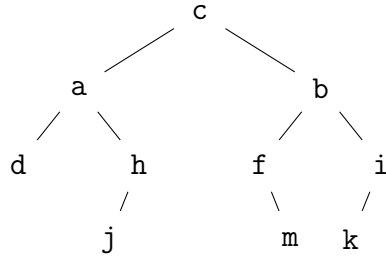Name:

# Introduction to Programming in Python, I Semester, 2011–2012
## Quiz 7, 17 November 2011

*Answer both questions in the space provided. Use the reverse for rough work.*
**Don't forget to fill your name!**

1. Consider the binary tree on the right.

```
                c
              /   \
            a       b
           / \     / \
          d   h   f   i
             /     \   /
            j       m k
```

(a) Draw another binary tree with the same preorder traversal as this one.

*Preorder traversal is* c a d h j b f m i k.

*Many other trees have the same traversal — for instance, move j from left child to right child of h. Or just create a "linear" tree rooted at c, left child a, left child d, . . . , left child k.*

(b) Draw another binary tree with the same postorder traversal as this one.

*Postorder traversal is* d j h a m f k i b c.

*Many other trees have the same traversal — for instance, move m from right child to left child of f. Or just create a "linear" tree rooted at c, left child b, left child i, . . . , left child d.*
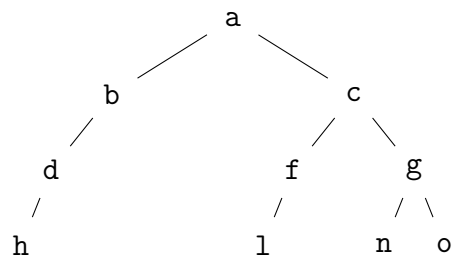
*(5 marks)*

2. Reconstruct the binary tree corresponding to the following infromation:

   - *Inorder traversal*:   h d b a l f c n g o
   - *Postorder traversal*:   h d b l f n o g c a

*From the postorder traversal, we know that a is the root. From the inorder traversal, we know that the left subtree of a has inorder traversal h d b and the right subtree has inorder traversal l f c n g o. The corresponding postorder traversals are h d b and l f n o g c, respectively. Proceeding recursively, we construct the tree on the right.*

```
              a
            /   \
          b       c
         /       / \
        d       f   g
       /       /   / \
      h       l   n   o
```

*(5 marks)*