Working With Trees – Patterns

Three main ways of moving through trees:

moving up the tree

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- loop with current node being updated to parent until the root is reached
- · moving down the tree, interested in only one child
 - loop with current node being updated to child until leaf is reached
- moving down the tree, interested in both children
 - recursion (left child and right child), with leaf as base case
 - if all nodes are visited, this is known as a traversal

(note – these are general patterns; modify specifics like starting or ending point as needed for a particular task)



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Three main ways of traversing trees:

- preorder visit node before children * / + 5 z 8 3 ^ 4 2
- inorder visit node between children 5 + z / 8 3 * 4 ^ 2
- postorder visit node after children $5z + 83 / 42^{*}$

+

z

8

3

5

 \wedge

4

All three traversals are special cases

of an Euler tour.

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- visit, left, visit, right, visit

(((5+z)/(8-3))*(4^2))

print (on first visit,) on third for internal nodes



visit the left subtree, then the node itself, then the right subtree	8 respondents	100 %	✓
visit all the nodes level by level, starting from the root and moving down		0 %	
visit the left subtree, then the right subtree, then the node itself		0 %	
visit the node, then its left subtree, then its right subtree		0 %	
visit the right subtree, then the node itself, then the left subtree		0 %	
visit the right subtree, then the left subtree, then the node itself		0 %	
visit the node, then its right subtree, then its left subtree		0 %	
2, 5, 6, 11, 7, 1, 9, 5, 9	7 respondents	88 %	~
1, 2, 5, 5, 6, 7, 9, 9, 11		0 %	
2, 5, 6, 11, 7, 1, 9, 5, 9	7 respondents	88 %	✓
1, 7, 2, 6, 5, 11, 9, 9, 5		0 %	
5, 9, 9, 1, 11, 6, 5, 7, 2		0 %	
1, 7, 9, 2, 6, 9, 5, 11, 5	1 respondent	13 %	
5, 9, 5, 11, 6, 2, 7, 9, 1		0 %	
1, 9, 9, 5, 7, 6, 11, 5, 2		0 %	
5 11 5			





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