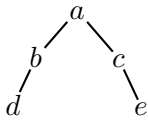


Department of Computing and Information Systems
COMP90038 Algorithms and Complexity Tutorial Week 9

The exercises

1. Traverse  in preorder, inorder, and postorder.
2. A certain binary tree yields a, b, c, d, e when traversed preorder, and it yields the same sequence when traversed inorder. What does the binary tree look like?
3. A certain binary tree yields 14, 83, 63, 42, 19, 27, 74, 99, 51, 37 when traversed preorder and 63, 83, 19, 42, 14, 27, 99, 51, 74, 37 when traversed inorder. Which sequence does it yield when traversed postorder?
4. The following algorithm was designed to compute the number of leaves in a binary tree T :

```
function LEAFCOUNT( $T$ )  
  if  $T = \text{EmptyTree}$  then  
    return 0  
  else  
    return LEAFCOUNT( $T.\text{left}$ ) + LEAFCOUNT( $T.\text{right}$ )
```

Fix the error in this algorithm.

5. Make a max-heap out of the keys A, L, G, O, R, I, T, H, M, using the bottom-up algorithm.
6. Construct a max-heap from the empty heap by inserting the keys A, L, G, O, R, I, T, H, M, one by one, in that order. Is the result the same as the heap from the previous question?
7. Apply the heapsort algorithm to A, L, G, O, R, I, T, H, M.