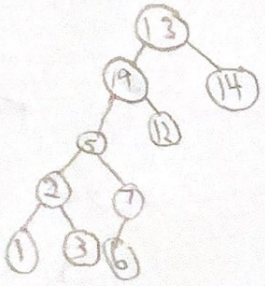
Jack Lancaster

Trees and Tree Algorithms

1. (10 points) Consider the following list of numbers (input from left-to-right):

   13 9 5 7 12 2 3 14 6 1

   (a) (6 points) Create the ordered binary tree.



   (b) (2 points) What is the **preorder** traversal of the tree?

VLR 13, 9, 5, 2, 1, 3, 7, 6, 12, 14

   (c) (2 points) What is the **inorder** traversal of the tree?

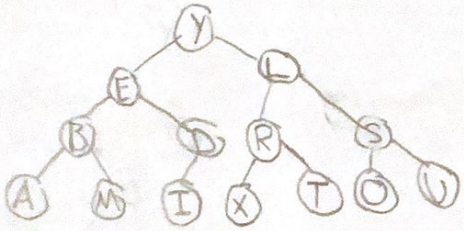
LVR 1, 2, 3, 5, 6, 7, 9, 12, 13, 14

2. (10 points) Consider the following binary tree traversals:

preorder: Y E B A M D I L R X T S O U

inorder: A B M E I D Y X R T L O S U

(a) (8 points) Recreate the binary tree.



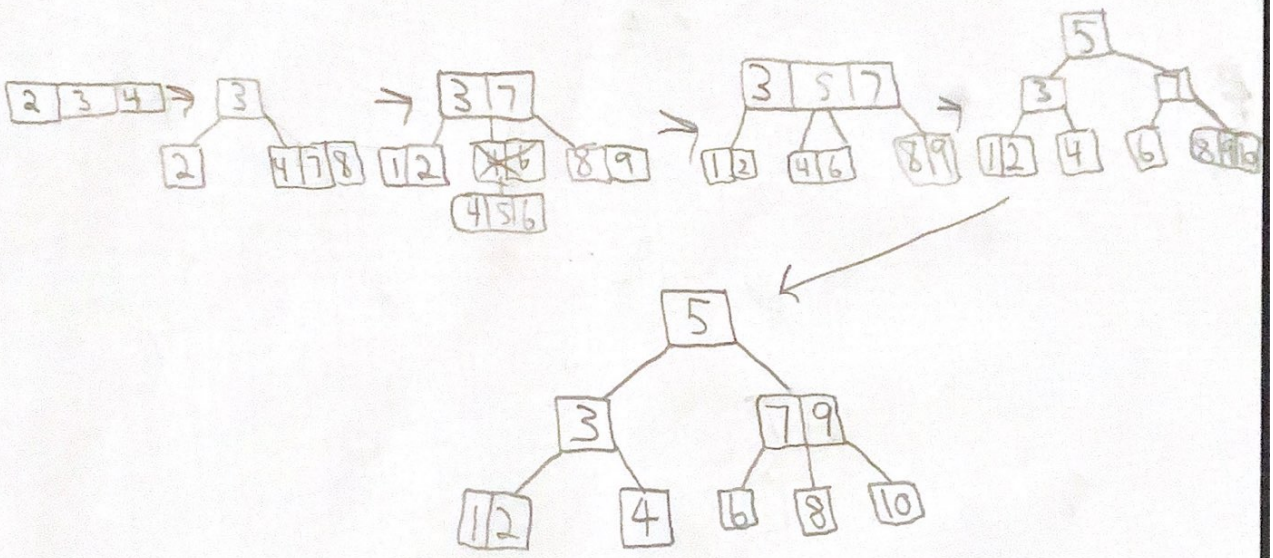
(b) (2 points) What is the postorder traversal of the tree?

LRV AMBIDEXTROUSLY

3. (12.5 points) Create the 2-3 tree from the following list of numbers (input from left-to-right). Make sure to show all intermediate steps.

2 3 4 7 8 1 6 9 5 10

2-3
2 parents 3 children



4. (12.5 points) Create the binary heap (a max heap) from the following list of numbers (input from left-to-right). Make sure to show all intermediate steps.

1 2 3 4 5 6 7 8 9 10