1. Design an algorithm which gives the preorder file format of a binary tree given a pointer to the root of a binary tree. Consider the binary tree has nodes with fields "data", "left\_child", and "right\_child".

Algorithm :

1. Make function PreOrder(Node root\_node).
2. Check if root\_node !=null than follow 3-7 steps else 8 step.
3. Write the root\_node.data in the file, followed by a newline.
4. Check if root\_node.left==null print “.” in a file followed by new line.
5. Check if root\_node.right==null print “.” in a file followed by new line.
6. If the current node has a left child than call recursively for left\_child PreOrder(root\_node.left).
7. If the current node has a right child than call recursively for right\_child PreOrder(root\_node.right).
8. Return -1.
9. Design an algorithm which takes a preorder file format of a binary tree and produces the binary tree. Use recursive approach.

Algorithm :

1. Read the first line of the preorder file format and create a new node with the character string as the "data" field.
2. If the next line in the file is not a dot, recursively call the algorithm on the next line to create the left child of the current node.
3. If the next line in the file is not a dot, recursively call the algorithm on the next line to create the right child of the current node.
4. Continue with steps 2-3 until all lines in the preorder file format have been processed.
5. Return the root node of the binary tree.