BRAC
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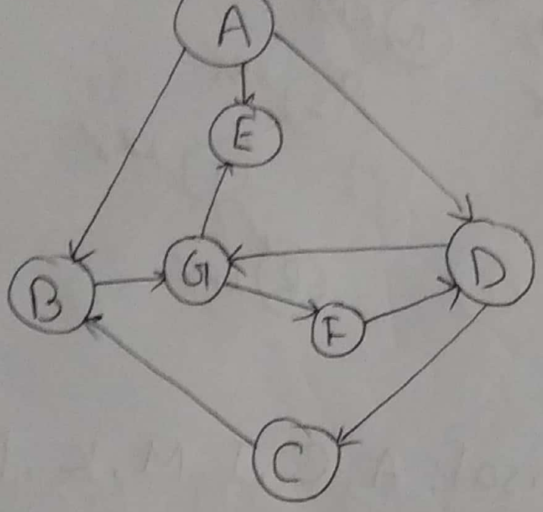
Inspiring Excellence

CSE220
DATA STRUCTURES
Lab Assignment: 07

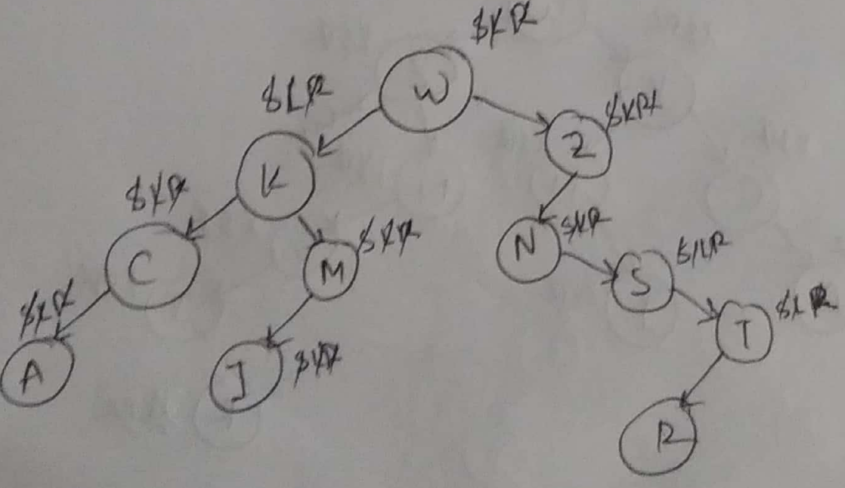
Submitted by:
Siam Rahman Karip
ID: 21101155
Section: 16
Semester: Spring’22

```
### Node Class for the Tree
class Node:
  def __init__(self,value,parent,left,right):
    self.value = value
    self.left = left
    self.right = right
    self.parent = parent

### Binary Tree Class
class binaryTree:
  def __init__(self, root):
    self.root = root

  ## Task 1
  def height(self, root):
    if root == None:
      return 0
    else:
      return 1+max(self.height(root.left),self.height(root.right))

  ## Task 2
  def level(self, node):
    if node.parent == None:
      return 0
    else:
      return 1 + self.level(node.parent)

  ## Task 3
  def preOrder(self, root):
    if root == None:
      return
    else:
      print(root.value)
      self.preOrder(root.left)
      self.preOrder(root.right)

  ## Task 4
  def inOrder(self, root):
    if root == None:
      return
    else:
      self.preOrder(root.left)
      print(root.value)
      self.preOrder(root.right)

  ## Task 5
  def postOrder(self, root):
    if root == None:
      return
    else:
      self.preOrder(root.left)
      self.preOrder(root.right)
      print(root.value)
```

(6) The equivalent graph of the given matrix will be:

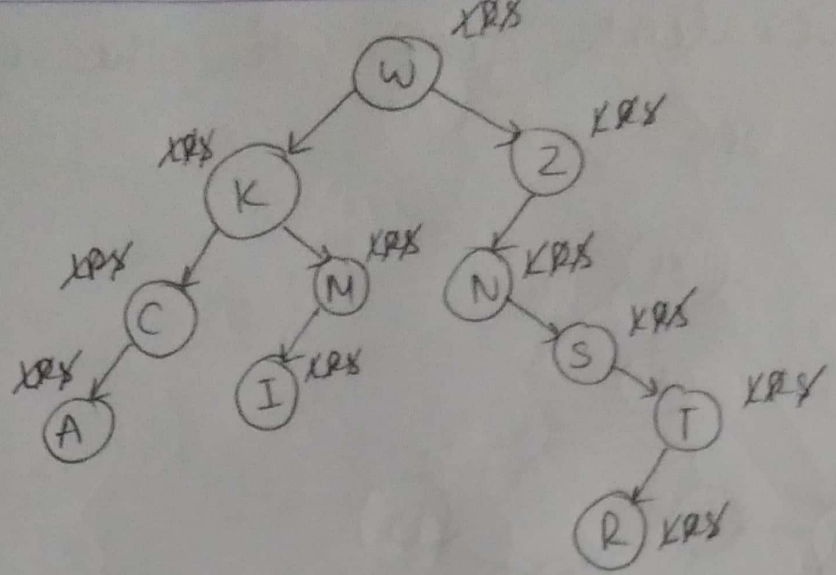


(7)



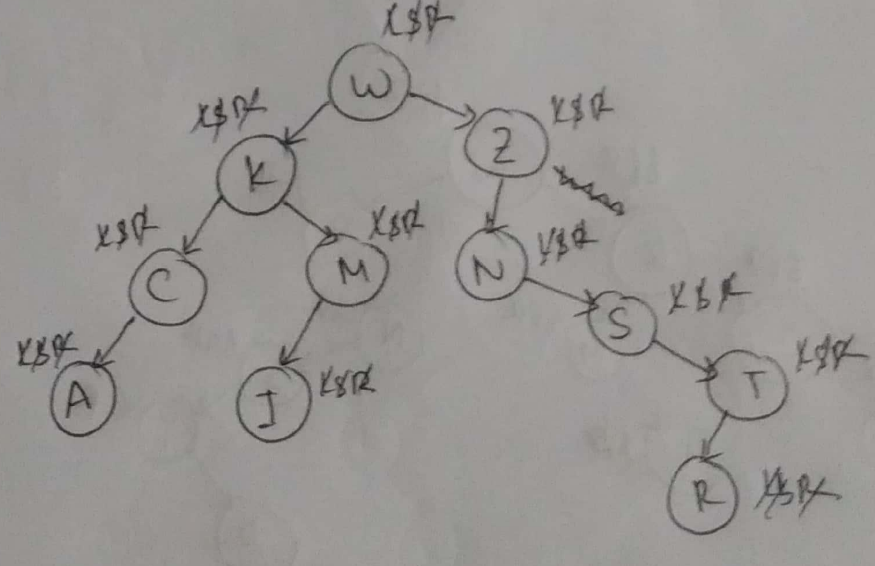
Pre-order traversal: W, K, C, A, M, I, Z, N, S, T, R

[illegible]

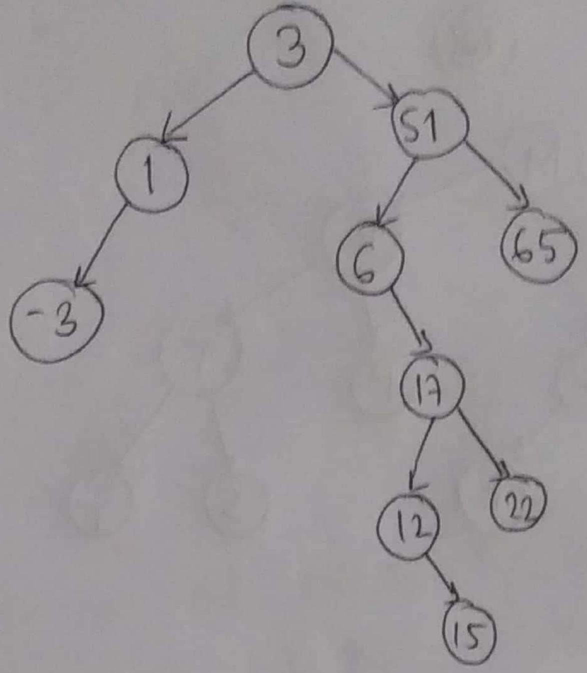


Post-order traversal: A, C, I, M, K, R, T, S, N, Z, W

[illegible]

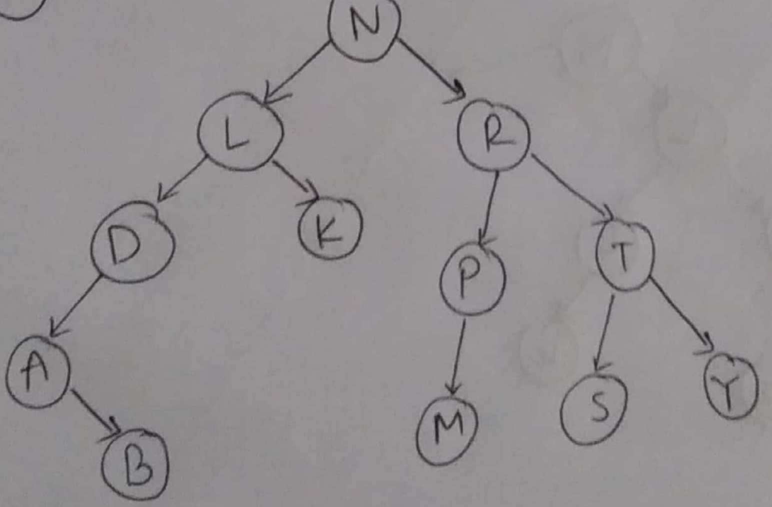


In-order traversal: A, C, K, I, M, W, N, S, R, T, Z a]



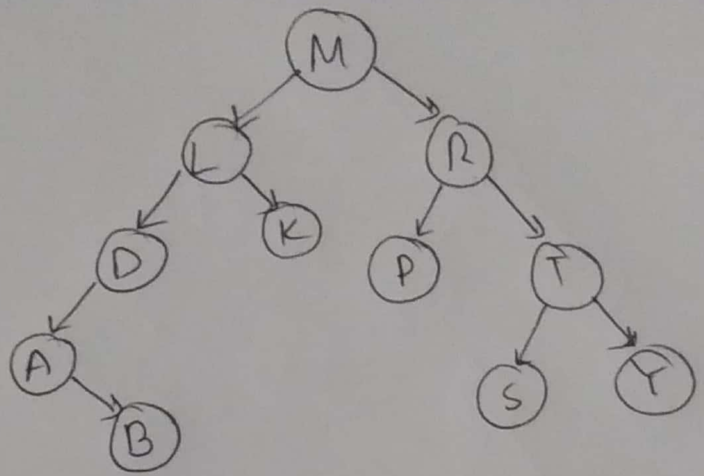
b]

a



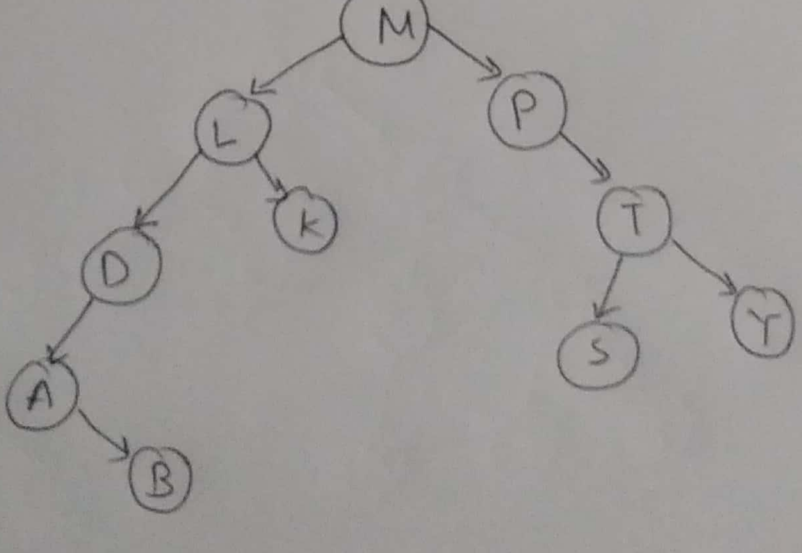
The successor of node E, i.e. Node L placed instead of E. Thus, E was removed

(b)



The successor of node N, i.e. node M was placed instead of N to remove N.

(c)



The ~~successor~~ predecessor of node R, node P was placed instead of R to remove R.