

CSCA48 Winter 2016

WEEK 5 – Tree

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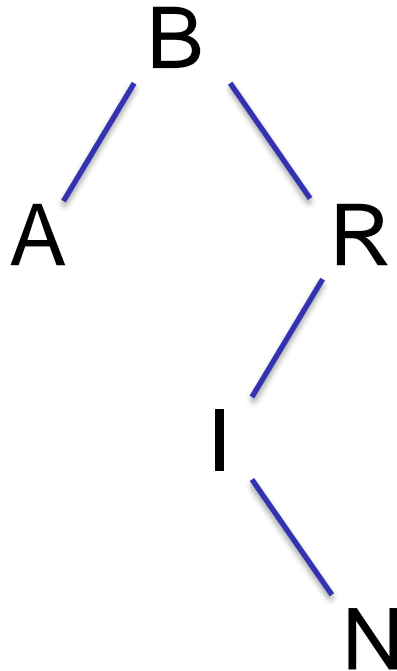
February 3, 2016

LEARNING OBJECTIVES

- At the end of the tutorial, you will be able to ...
 - Draw binary search trees
 - Figure out 4 types of tree traversals
 1. pre-order traversal
 2. post-order traversal
 3. in-order traversal
 4. level-order traversal

Binary Search Tree

- Build the binary search tree(BST) using B R I A N

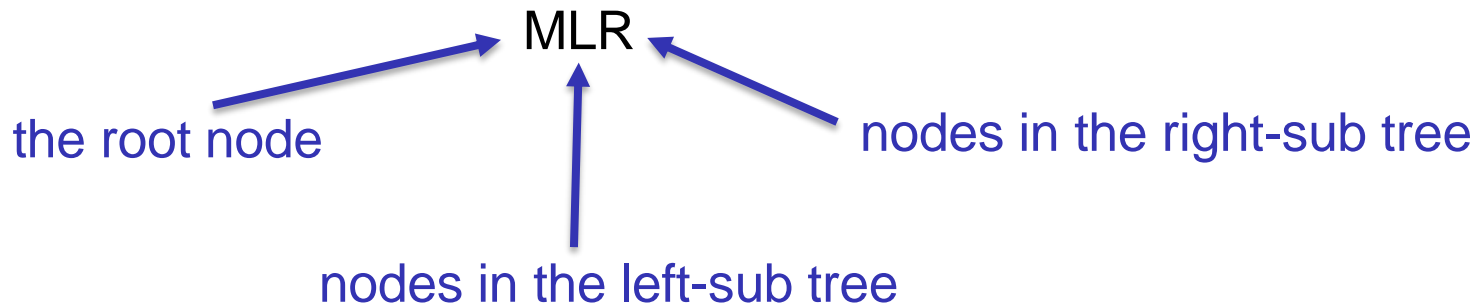


Tree Traversals

1. pre-order traversal
2. post-order traversal
3. in-order traversal
4. level-order traversal

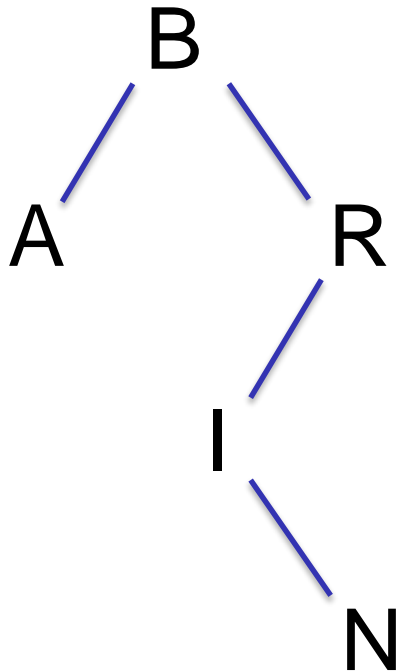
Rules of Traversals

1. pre-order traversal: MLR
2. post-order traversal: LRM
3. in-order traversal: LMR



Pre-order Traversal

- Pre-order traversal: MLR



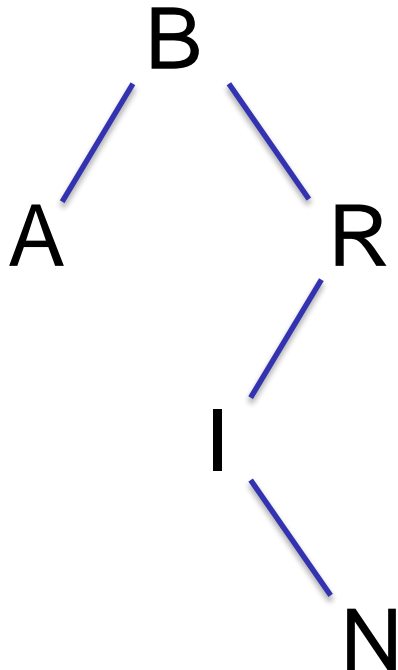
- steps:

1. count number of nodes
2. find the root node
3. find the left-sub tree
4. find the right-sub tree
5. apply the formula: MLR
6. repeat 2 – 5 until each node finds its own position

- ANS: B A R I N

Post-order Traversal

- Post-order traversal: LRM



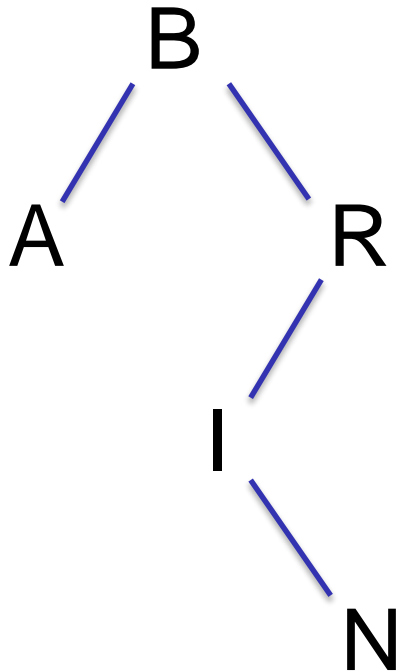
- steps:

1. count number of nodes
2. find the root node
3. find the left-sub tree
4. find the right-sub tree
5. apply the formula: LRM
6. repeat 2 – 5 until each node finds its own position

- ANS: A N I R B

In-order Traversal

- In-order traversal: LMR

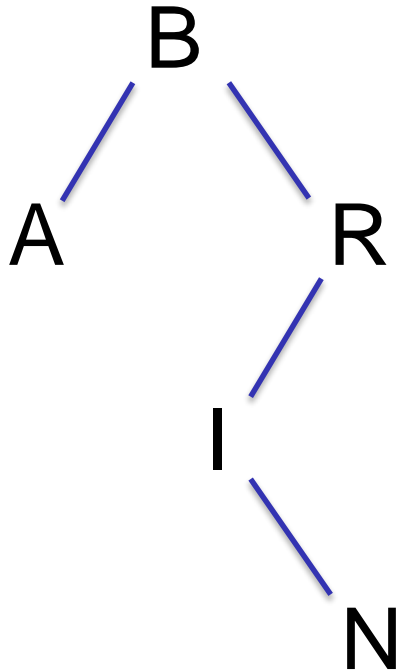


- steps:
 1. count number of nodes
 2. find the root node
 3. find the left-sub tree
 4. find the right-sub tree
 5. apply the formula: LMR
 6. repeat 2 – 5 until each node finds its own position

- ANS: A B I N R

Level-order Traversal

- In-order traversal: find nodes by level



- ANS: B A R I N

Tree Traversal

- Pseudo-code

```
my_container.put(head)
while container is not empty:
    next_node = container.get()
    print(next_node)
    for each child:
        container.put(child)
```