

Lecture 4 Rooted Trees

▼ Terminology

- A set of nodes which stores elements in a parent-child relationship

▼ Components

- Root
- Parent
- Child
- Siblings
- Leaf(external)
- Internal

▼ Binary Trees

- A rooted ordered tree in which every node has at most 2 children
- Proper if each internal node has exactly 2 children

▼ ADT Methods

▼ Access Methods

- root()
- parent(v)
- children(v)

▼ Query Methods

- isInternal(v)
- isExternal(v)
- isRoot(v)

▼ Generic Methods

- size()
- elements()
- positions()
- swapElements(u, v)
- replaceElements(v, e)

▼ Depth & Height

▼ Depth

- Recursive function -- T.isRoot(v)

▼ Height

- The maximum depth of an external node

▼ Tree Traversal

▼ Preorder

- mid -> left -> right

▼ Postorder

- left -> right -> mid

▼ Inorder

▼ left -> mid -> right

- Application: Parsing arithmetic expressions