Abstract Data Types: Trees

The Tree ADT

Implementation of a Set 2
The Tree ADT

The tree ADT corresponds to a mathematical tree. A tree is defined recursively in terms of nodes:

- A tree is a node
- A node contains a value and a list of trees.
- No node is duplicated.
A binary search tree is a tree with the following additional properties:

- Each node has \textit{at most two} sub-trees
- Nodes may contain \textit{(key, value)} pairs (or just keys)
- Keys are ordered within the tree:
  - The left sub-tree only contains keys less than the node’s key
  - The right sub-tree only contains keys greater than the node’s key
Abstract Data Types: Trees

- mango
- orange
- peach
- apple
- banana
- grape
- cherry
- plum
- pear
- apricot

Diagram:
- apple
- orange
- peach
- banana
- mango
- cherry
- grape
- plum
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fruit

apple

orange

banana

apricot

mango

cherry

grape

pear

peach

plum

fruit.contains("orange")

fruit.contains("grape")

fruit.contains("fig")