Abstract Data Types: Trees

A5

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

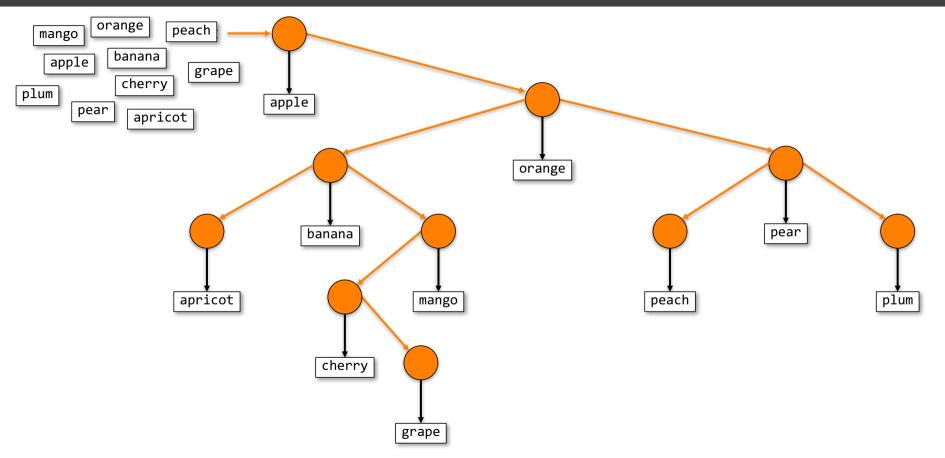- A node contains a *value* and a list of *trees.*

- No node is duplicated.

Binary Search Tree

A **binary** search tree is a tree with the following additional properties:
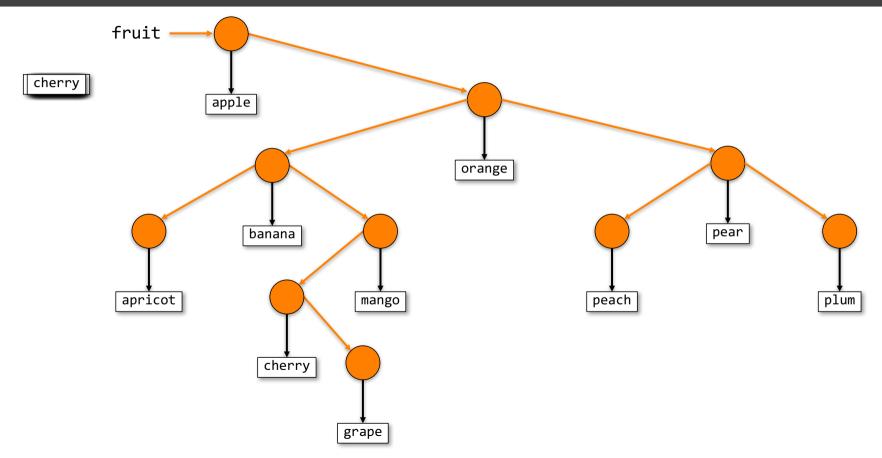
- Each node has *at most* **two** sub-trees

- Nodes may contain *(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

fruit

`fruit.contains("grape")`

apple

orange ✔

banana

apricot

mango

cherry

grape ✔

✘

peach

pear

plum