CSE 101-02 5-18-23

PA6: ext. 2 days → monday

- no argument constructor

BigInteger()

signum	digits
0	()

- from-long constructor

BigInteger(x)

x > 0 : | 1 | → (·, ·, ·, ·)

x = 0 : | 0 | → ()

x < 0 : | -1 | → (·, ·, ·, ·)

Why the from-long?

$37512 * A + 592977 * B$

- from-string constructor

BigInteger(s)

say

s = "12|3 4 5|678|987|6 5 4"

b = 1000

P = 3

use in string.h:

- substr()
- stol()
- length()

Dictionary ADT

- BST ch. 12 (CLRS)
- RBT ch. 13 "
- Hash Table ch. 11.

State: a finite set of ordered pairs of the form

(key, value)

i.e.

$\{(K_1, V_1), (K_2, V_2), \ldots, (K_n, V_n)\}$

Require: keys are distinct.

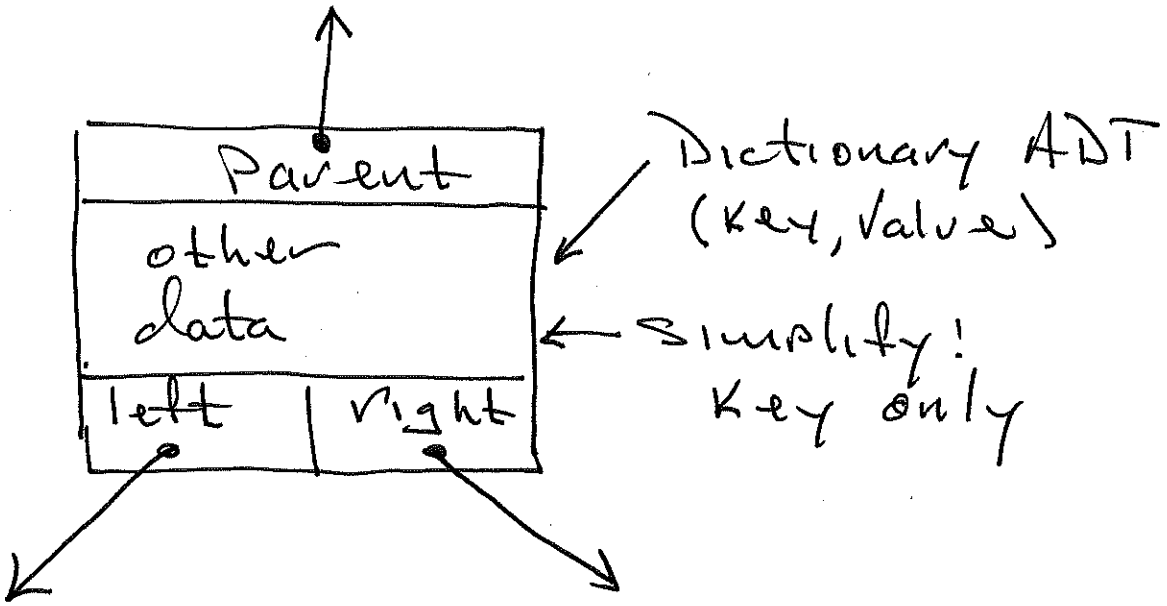
Operations

- lookup(key): returns value assoc. with key, or nil if key is not in dictionary.
- insert(key, value): adds a new pair to dictionary.
  Pre: lookup(key) = nil.
- delete(key): removes (key, value) from dictionary.
  Pre: lookup(key) ≠ nil.

Binary Search Trees (BST)

ch. 12 of CLRS.

Node Object



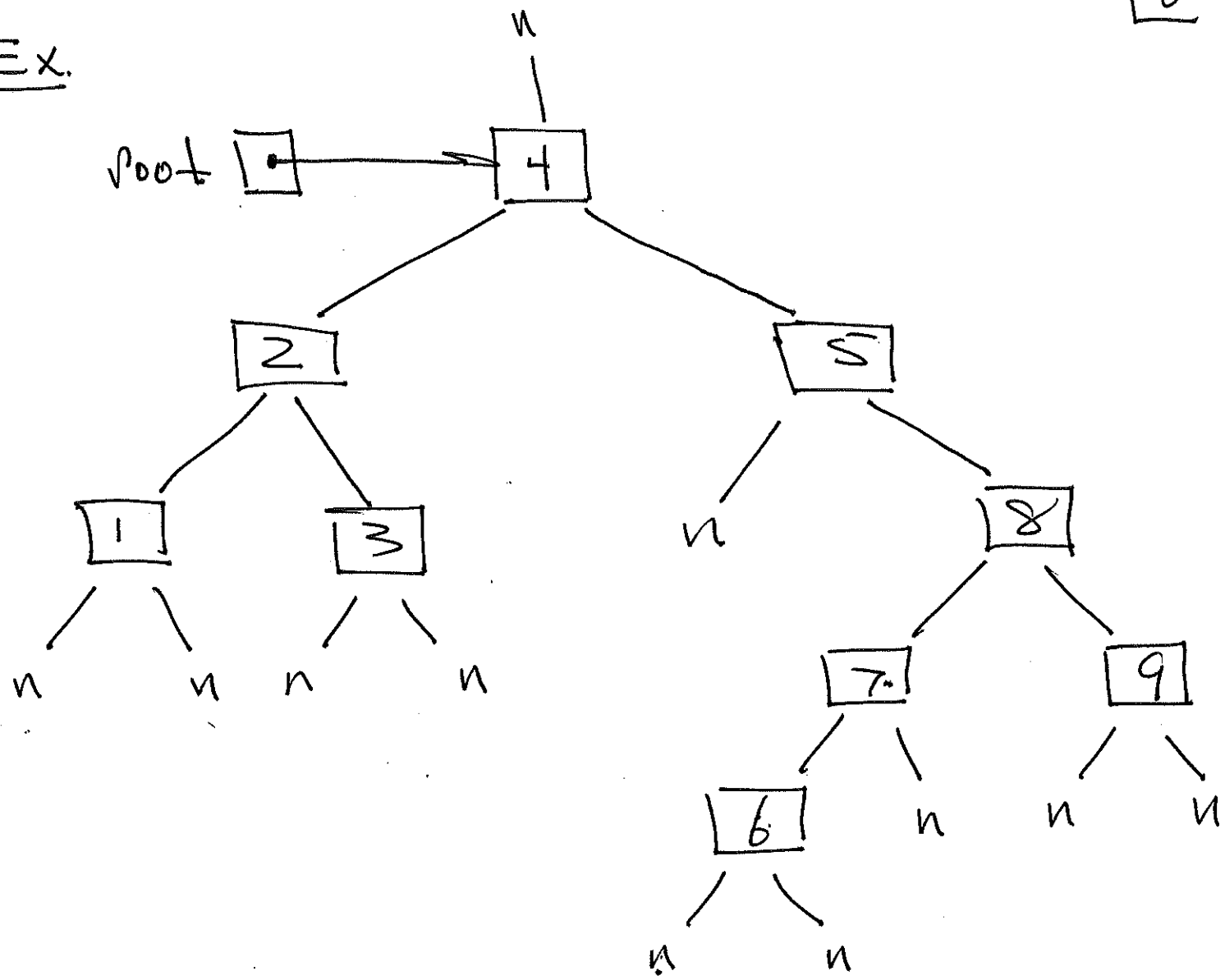
BST Properties

let x, y be nodes.

(1) if y is in the left subtree of x, then: $key[y] \leq key[x]$

(2) if y is in the right subtree of x, then: $key[x] \leq key[y]$.

Ex.

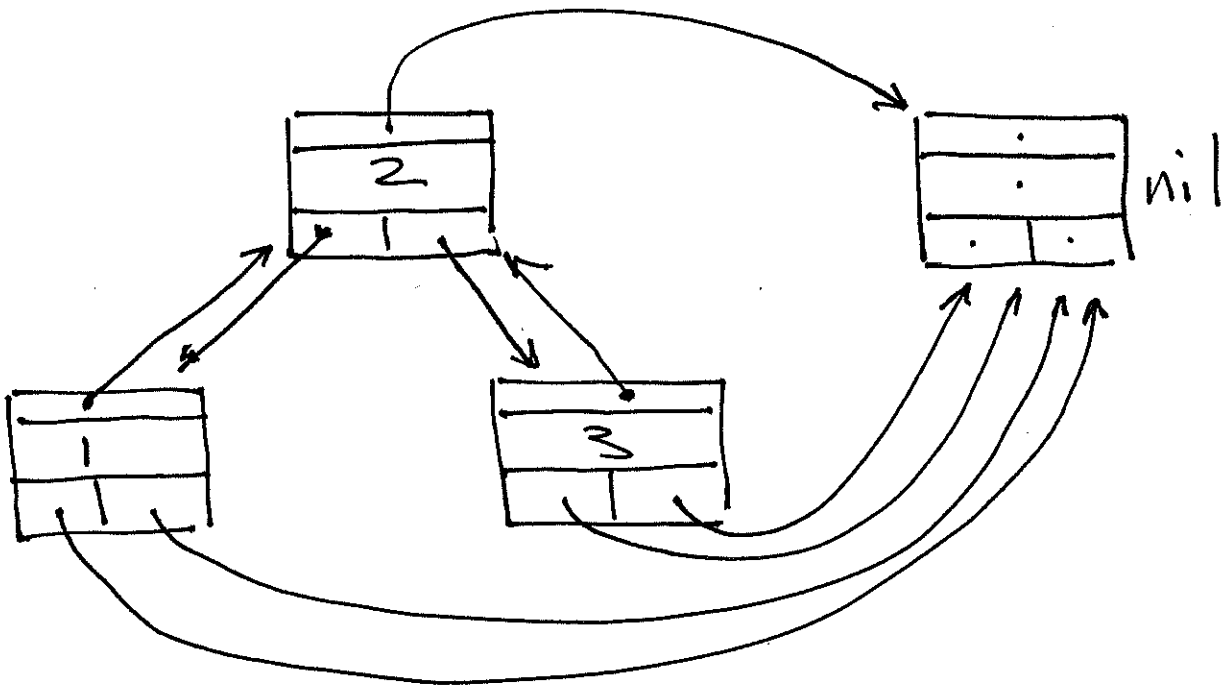


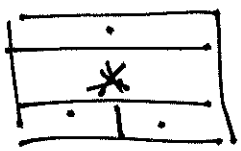
Defn

- A leaf is a node with no children
- An internal node is a non-leaf.

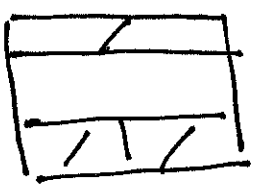
what is nil?

Recommend: nil is a dummy node, i.e. a sentinal.

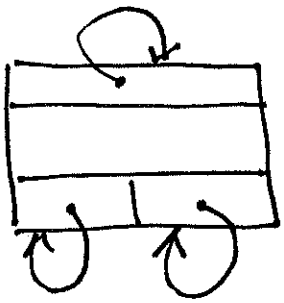




← what goes here



or



Tree Traversals

- InOrderTreeWalk(x) ✓
- PreOrderTreeWalk(x) ✓
- PostOrderTreeWalk(x) ✓

Ex.

I.O.T.W : 1 2 3 4 5 6 7 8 9

Pre. O.T.W : 4 2 1 3 5 8 7 6 9

Post O.T.W : 1 3 2 6 7 9 8 5 4