

CSE 101-01 5-19-22

Pa7: ext. 1 day (due Tue.)

analogy with list from Pa1

list

move Front()

move Back()

get()

move Next()

move Prev()

Dictionary

begin()

end()

{ currentKey()
currentVal()

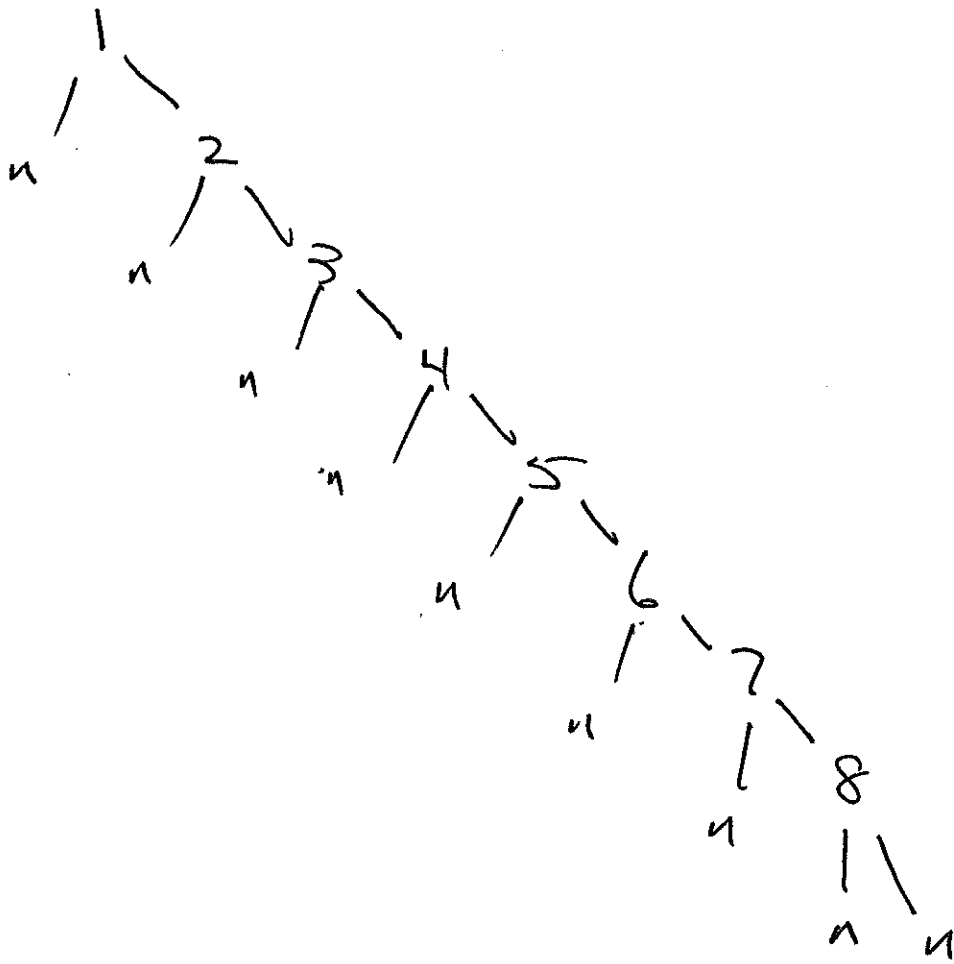
next()

prev()

Recall: BST insertion

2

Ex. Keys: 1 2 3 4 5 6 7 8



one solution! randomize
keys before insertion.

what if you need a BST with
a certain (not expected)
high efficiency.

Ans: Red Black Trees
(chap 13).

Defn

A RBT is a BST, that
also satisfies:

convention: leaves in a RBT are
considered to be the nil children
of key bearing nodes.

RBT Properties

1. Each node is Red or Black
2. Root is Black
3. Each leaf (nil child) is Black
4. Every Red node has 2 black children . i.e. we never have 2 Reds in a row on a descending Path
5. For any node x , every descending path from x to a leaf contains the same number of black nodes .

Defn

The Black height of x , denoted $bh(x)$, is the # of Black nodes in any descending path from x to a leaf (not counting x itself.)