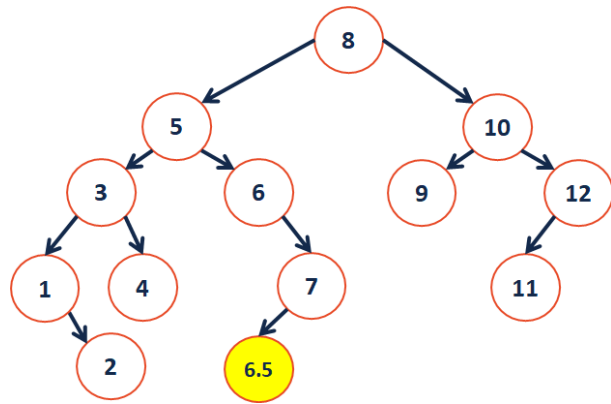
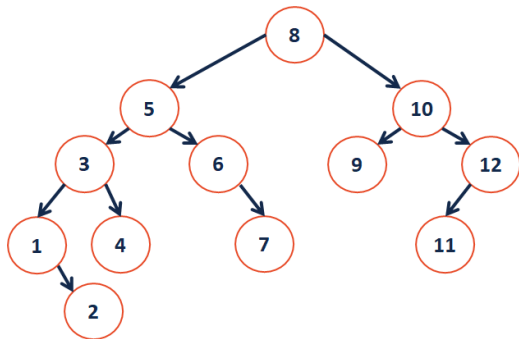


AVL Insertion



AVL Removal



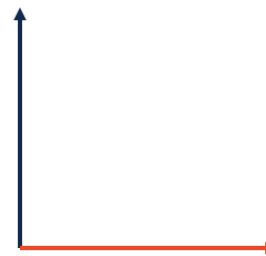
Running Times:

	AVL Tree
find	
insert	
remove	

Motivation:

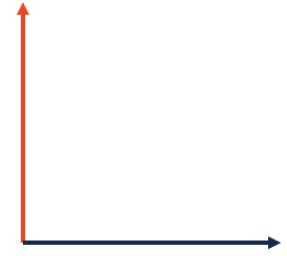
Big-O is defined as:

Let $f(n)$ describe the height of an AVL tree in terms of the number of nodes in the tree (n). Visually, we can represent the big-O relation:



$f(n) \leq c \times g(n)$: Provides an upper bound:

The height of the tree, $f(n)$, will always be less than $c \times g(n)$ for all values where $n > k$.



$f^{-1}(h) \geq c \times g^{-1}(h)$: Provides a lower bound:

The number of nodes in the tree, $f^{-1}(h)$, will always be greater than $c \times g^{-1}(h)$ for all values where $n > k$.

Plan of Action:

Goal: Find a function that defines the lower bound on **n** given **h**.

Given the goal, we begin by defining a function that describes the smallest number of nodes in an AVL of height **h**:

Proving our IH:

V. Using a proof by induction, we have shown that:

...and by inverting our finding:

Theorem:

An AVL tree of height **h** has at least _____.

I. Consider an AVL tree and let **h** denote its height.

II. Case: _____

III. Case: _____

IV. Case: _____

Inductive hypothesis (IH):

Summary of Balanced BSTs:

Advantages	Disadvantages

CS 225 – Things To Be Doing:

1. Theory Exam 2 is ongoing
2. mp_traversals is out, EC+7 this coming Monday
3. lab_huffman is due on Sunday
4. Daily POTDs are ongoing, +1 each completed POTD! :)