

Binary Search Trees

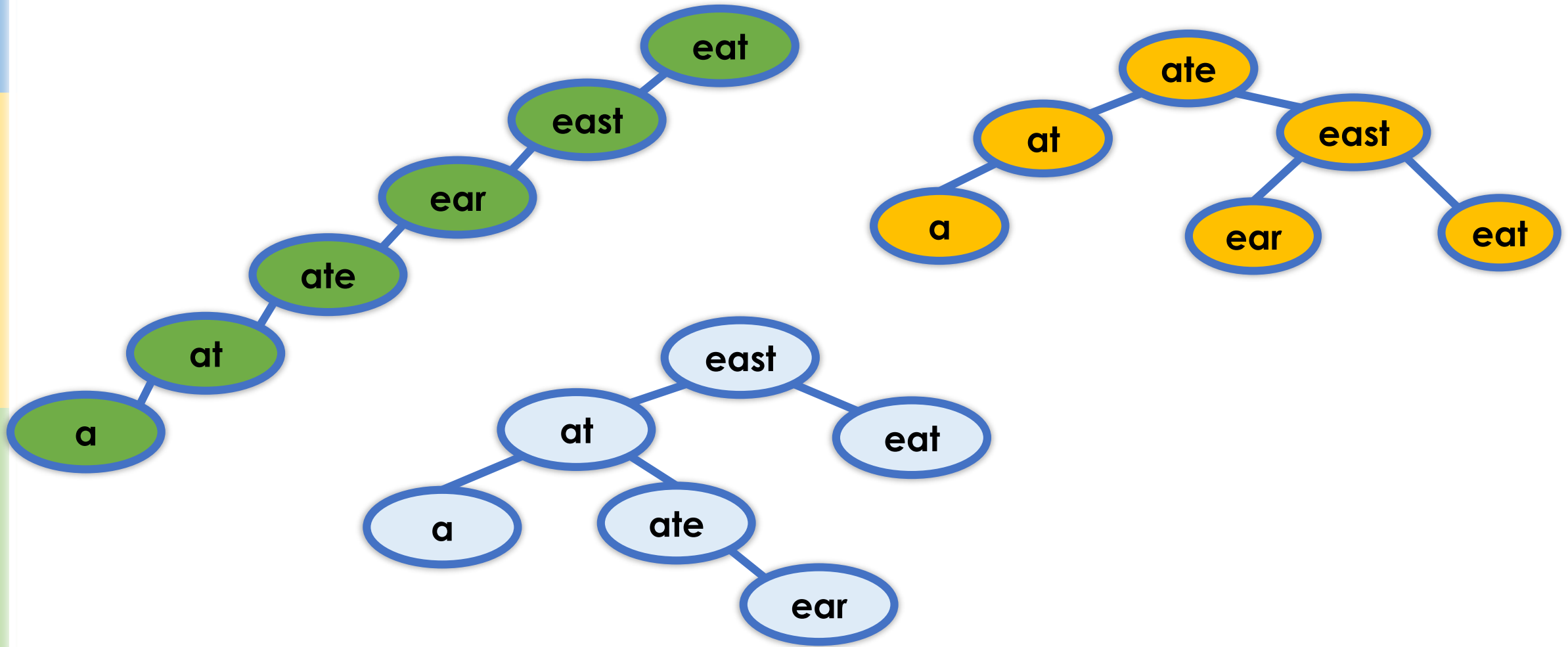


Performance

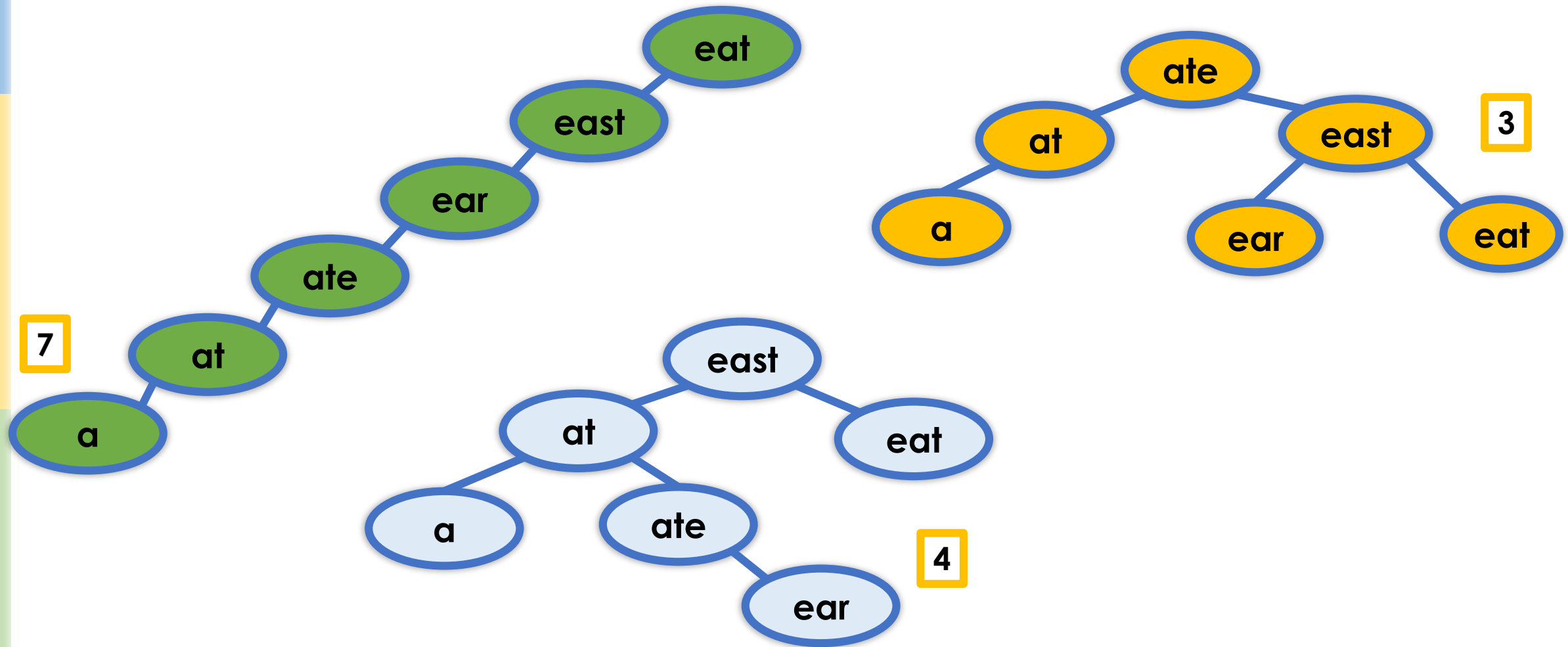


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by Christine Alvarado, Mia Minnes, and Leo Porter, 2015.

Max distance until leaf?

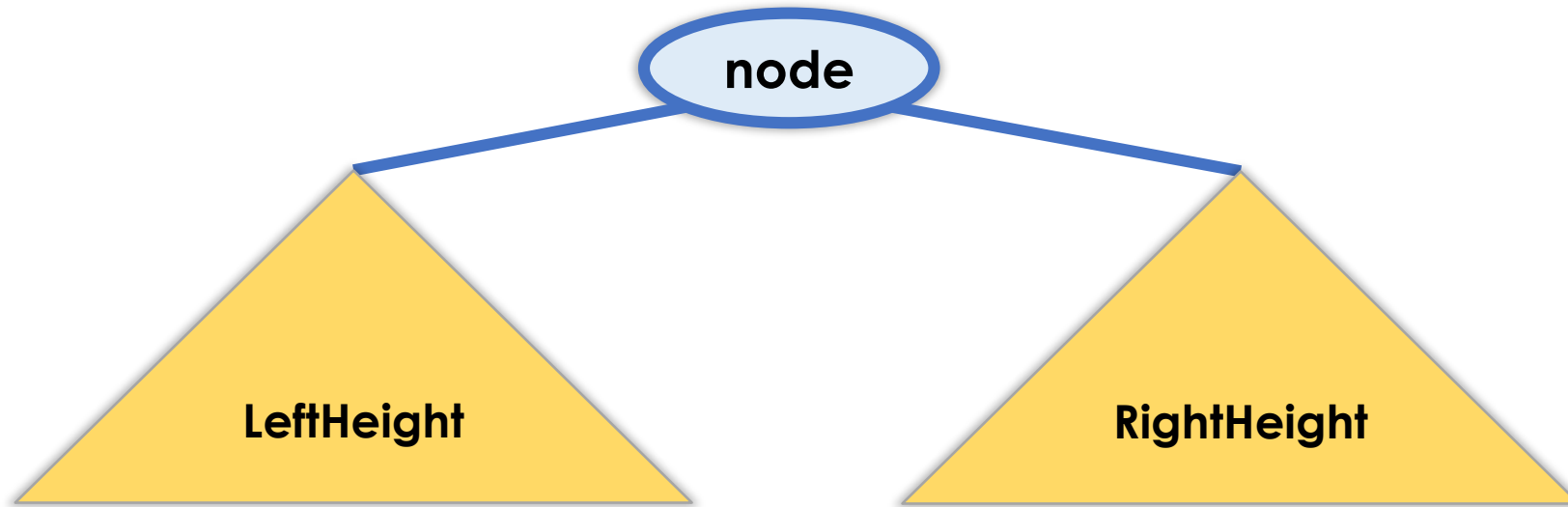


Max distance until leaf?



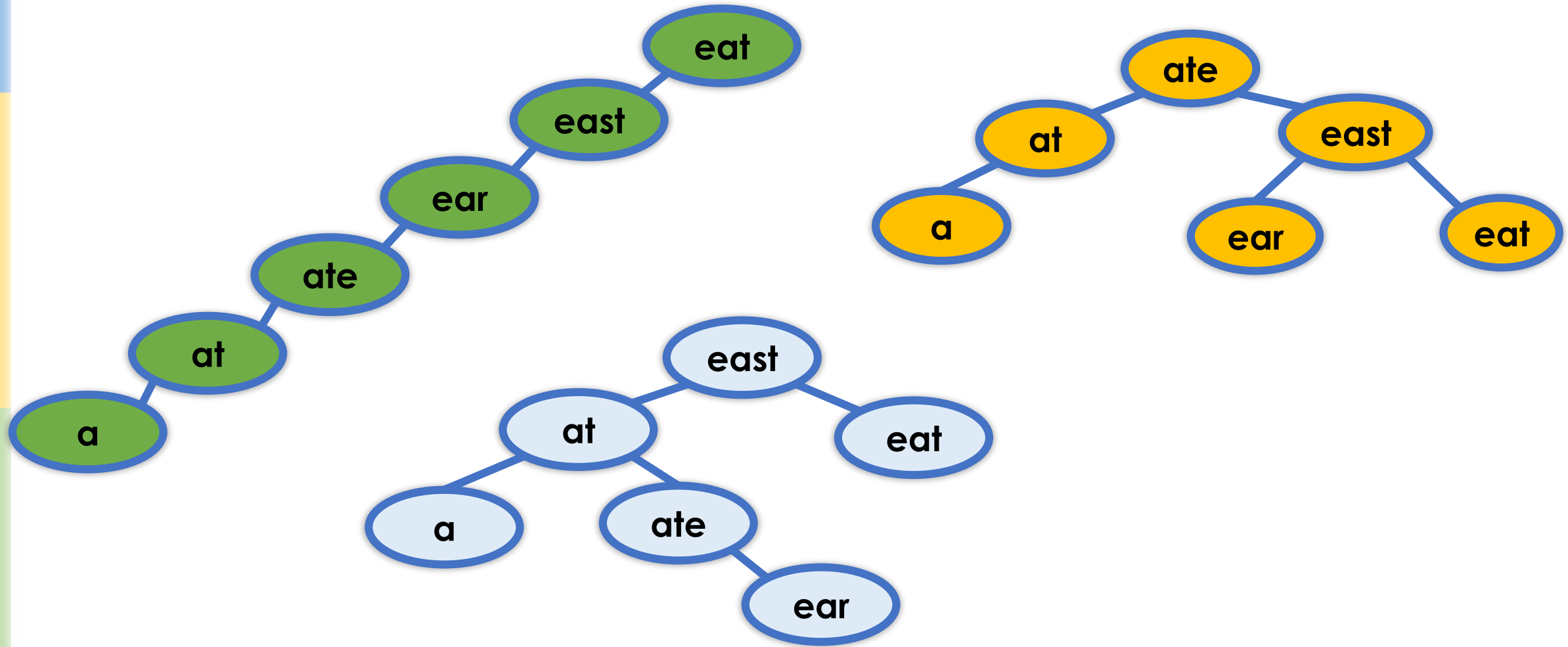
Balanced BST

$$| \text{LeftHeight} - \text{RightHeight} | \leq 1$$

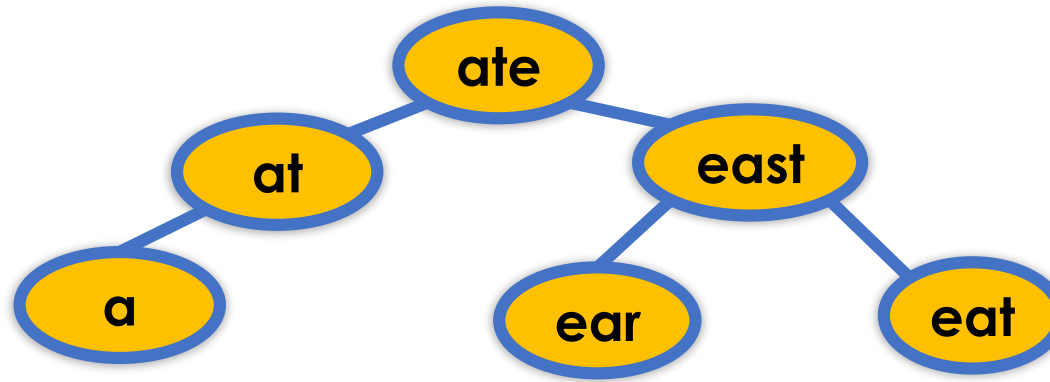


Balanced BST

IVQ: which are?

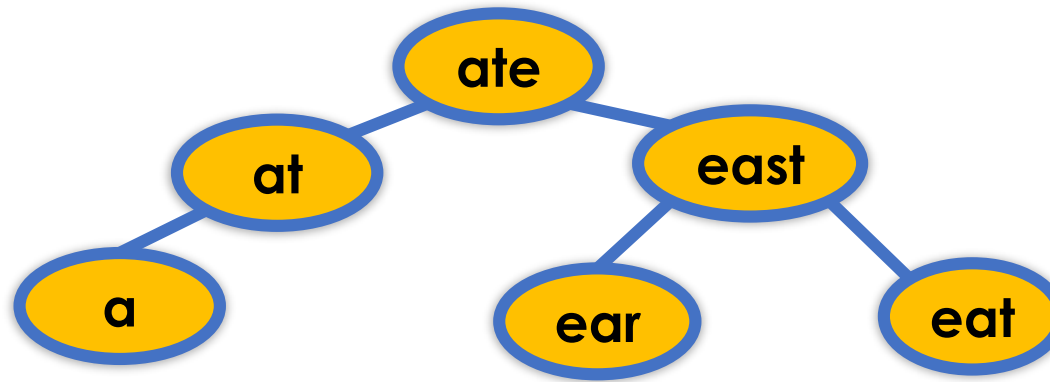


Balanced BST



Balanced BST

height $\approx \log(n)$



`isWord(String wordToFind)`

	Best case	Average case	Worst case
Linked List	$O(1)$	$O(n)$	$O(n)$
BST	$O(1)$	$O(\log n)$	$O(n)$
Balanced BST	$O(1)$	$O(\log n)$	$O(\log n)$

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	Best case	Average case	Worst case
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BST	$O(1)$	$O(\log n)$	$O(n)^*$
Balanced BST	$O(1)$	$O(\log n)$	$O(\log n)$

* Especially if insert to BST in order!

`isWord(String wordToFind)`

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Balanced BST	$O(1)$	$O(\log n)$	$O(\log n)$

How to keep balanced? TreeSet in Java API

Thought question

- What's the performance of other operations?
 - `isWord()`
 - `addWord()`