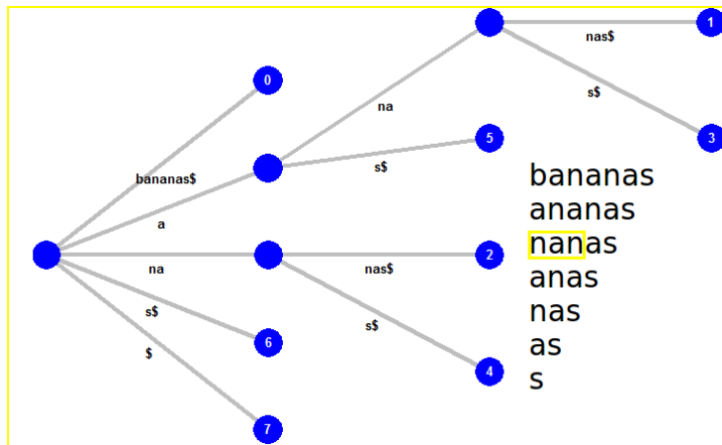


Animating Suffix Tree Algorithms

Alice Paul

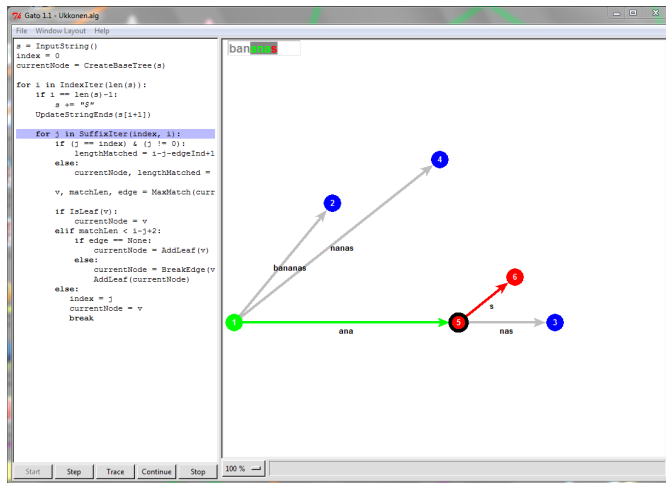
July 14th, 2011

What is a suffix tree?



Note: Every substring is a prefix of a suffix.

Gato



Match and Extend

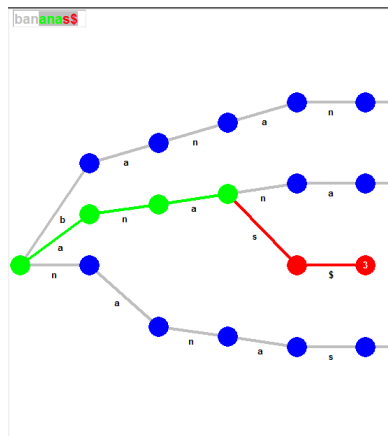
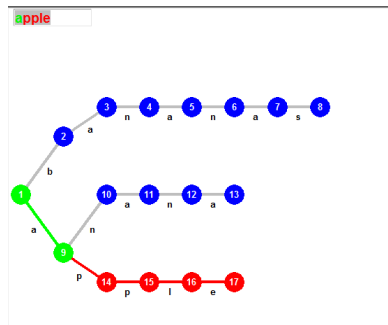
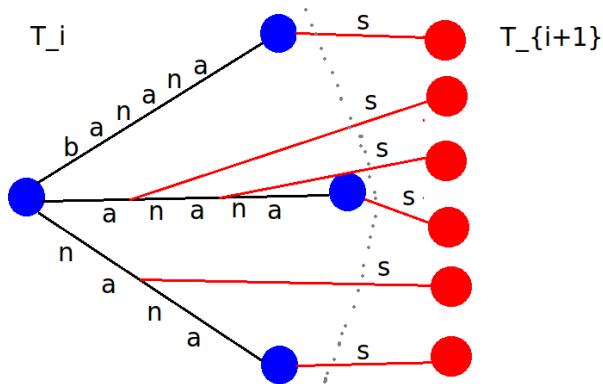


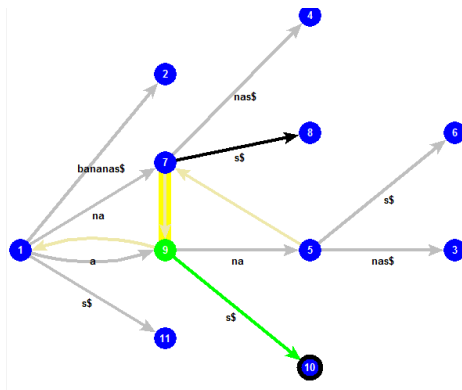
Figure: Naive Prefix and Naive Suffix animations, resp.

Ukkonen's Algorithm - Implicit Suffix Trees



Speed ups

Suffix Links: For every internal node, whose path from the root is $x\alpha$ there is another node in the tree with path α .



Animations:

Algorithm	Running Time
Naive Prefix	$O(n^2)$
Naive Suffix	$O(n^2)$
Cubic	$O(n^3)$
Cubic + Index Speed Up	$O(n^2)$
Cubic + Suffix Links	$O(n^2)$
Ukkonen	$O(n)$
Suffix Array	$O(n)$

References:

- ▶ Gusfield, Dan. *Algorithms on Strings, Trees, and Sequences: Computer Science and Computational Biology*. Cambridge [England: Cambridge UP, 1997. Print.
- ▶ Schliep, Alexander. “CATBox: An Interactive Course in Combinatorial Optimization.” *Schliep.org*. Web. 04 June 2011. <http://schliep.org/CATBox>.