DSC 190 - Discussion 07

Problem 1.

Draw a trie representing the following collection of strings:

$$\{\texttt{"friend"}, \texttt{"frog"}, \texttt{"frob"}, \texttt{"fun"}, \texttt{"glob"}, \texttt{"glarb"}, \texttt{"glow"}, \texttt{"guard"}\}$$
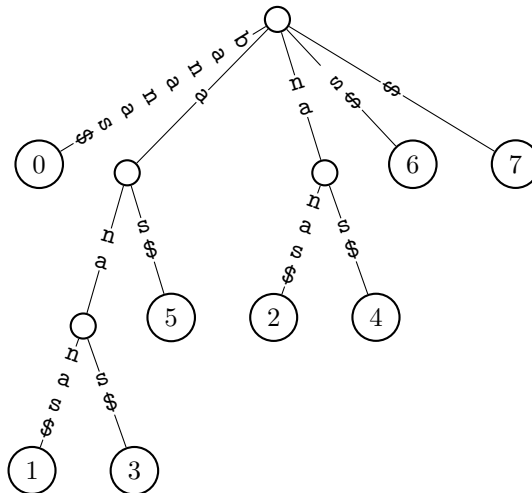
Problem 2.

Draw the suffix tree for the following strings:

a) `"mississippi"`

b) `"aaaa"`

Problem 3.

Each edge in a suffix tree for s is associated with one or more characters. For instance, the edges in the suffix tree for `"bananas"` represent the strings `"bananas$"`, `"nas$"`, `"na"`, `"a"`, etc.

a) Suppose the suffix tree is implemented by storing the string associated with each edge explicitly in memory. In other words, the string `"nas$"` will be stored somewhere in memory, `"na"` will be stored, etc. How much memory is used in the worst case to stored these strings in terms of $|s|$?

Hint: in the worst case, the string s has no repeated characters.

b) Describe a way of storing the suffix tree so that only $\Theta(|s|)$ memory is used for storing strings. In other words, how can we know what string is associated with each edge without actually storing that string?