

Homework 8

CSCI-SHU 210 Data Structures

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Fall 2014

Your task this week is to code a trie.

1 Read.

Read section §13.5 in the book.

2 What you must do.

Here are your tasks:

- Write code that will, given a string, create a trie of all of the suffixes of the string (a *suffix trie*).
- Write code that will, given a string, create a compressed trie of all the the suffixes of the string (a *compressed suffix trie*).
- Write code that will, given a string, use the trie to compute the longest repeated substring. For example, in `acatbcatbcattff` the string `catbcat` is the longest string that appears more than once. In case of a tie, pick arbitrarily.
- Write pygame code that will allow the user to enter a string and have it visualize the trie. Allow the user to switch between the regular and compressed trie. Display the longest repeated string.
- What is the runtime of your code for each of first three tasks above when you run it on a string of length n ? Write up a short explanation and hand that in separately.

3 Hints

Note that one of your questions on exam 2 was to build a trie when the alphabet only has the letters L and R (of course, I did not call it a trie on the exam). You can code the answer however you want. You are free to use code from the book, from the previous homework (both yours and the posted solutions). As usual, you can not use code from the internet or other students. It can be easier to code if you add a character to the end of the string that does not appear in the string. I do this in my demo, and use the `$` character for this purpose.

4 When and how due

Hand in everything the same way you did for HW1. Due date is Monday November 24th at 11:55PM. You will go over the HW in personal meetings on Wednesday the 26th which is a Friday schedule.

5 Help!

Please do not hesitate to contact Ben or John if you have any questions. We are here to help! This week John will be at Tsinghua in Beijing on Thursday and Friday, but feel free to ask questions electronically.