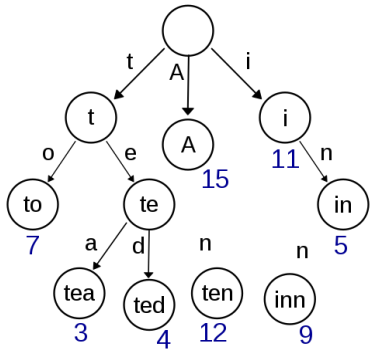
Graphs and Trees HW

1. Create a ternary tree (instead of binary - having two children, every node should have through children). Compare the search time between binary and ternary trees for very large trees.
2. Imagine we have graph G with weighted paths (in a matrix, so that instead of just having a 1 or 0 to show connections, we have a number to show the weight). We also have graph H which is a different weighted graph. G and H represent cities (each with 5 nodes and random weighted connections as vertices). Mr. Government would like to build 2 roads to attach these cities. Create a program that places the two roads (with some reasonable weights) between G and H. Each of the new roads must not come from or go to the same node as the other new road (i.e. it cannot be that both roads leave G or enter H from the same node). Your program should have an algorithm to create one large map M that includes G, H, and the two new roads. It is best if your algorithm can take in any sized G, H, and any number of new number of roads.
3. Create an algorithm that finds the *longest* path from a chosen node N_1 to another chosen node N_2 from a graph G.



4. We have decided to store words in a tree. As such: . Notice how we do this. For the word "to", "tea" "ted" and "ten" - they all are stored starting from "t" and then branching out, letter by letter. This will help us look up words via their spelling (like in a dictionary). Create an algorithm to populate such a tree and search it.
5. We have decided to create a rhyming dictionary. Use a similar idea to the above to sort words based on a rhyming scheme (up to you how to do it).
6. Chuck Norris was placed in a warzone and he needs to save all of the civilians while defusing bombs. Create a graph with each node either having a bomb or not, and also having a random amount of people screaming for help. As soon as Chuck Norris arrives at a square he is able to diffuse the bomb and thereby save the people (upon which time they stop screaming for help). He immediately goes to the next closest square based on the number of people screaming for help. Trace Chuck Norris' path through the warzone and identify his choices with outputs. If you want to up the ante, give the bombs a random amount of time before they explode and see how many people he can save.

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