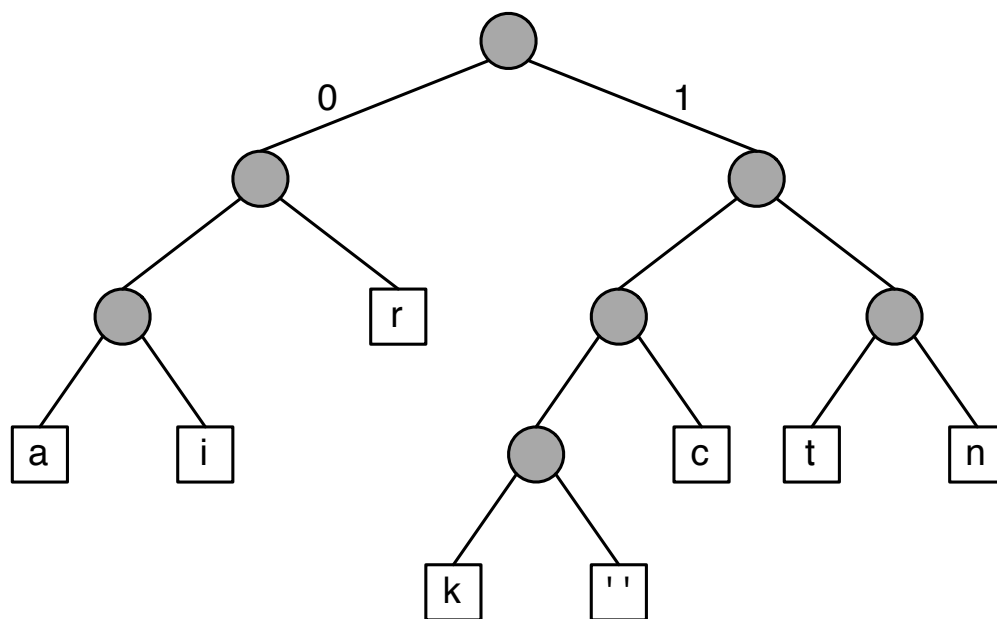


**Problem 1)**

Consider the Huffman tree below (we won't use an EOF sentinel in this worksheet).



Encode the following:

- train track
- rat attack

Decode the following:

- 110010011011000
- 010000011111001101000111

**Problem 2)**

Construct an optimal Huffman tree for ogopogo. What is the length of the encoding of this text?

Do the same for the state mississippi. Include the space character.

**Challenge Problem)**

Suppose you were already given the list of characters with their frequencies and they were sorted in increasing order of frequency (for example,  $[( 'p', 1), ( 'n', 2), ( 'o', 4)]$ ). Describe how to construct an optimal Huffman tree in linear time.