Name: ROTHA Dapravith
ID: e20190915
Group: I5-GIC(B)

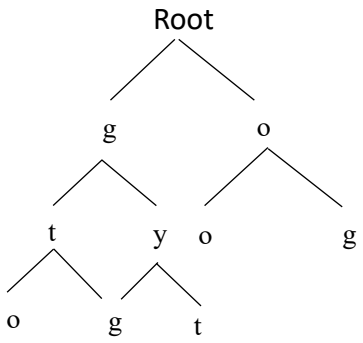
Assignment Lesson 6

1) Draw a Huffman tree and calculate average codeword length? If we have:
   - ⇨ Input string: " gotoyooggy " (double quotation marks doesn't)
2) Draw a Huffman tree and calculate average codeword length? If we have:
   - ⇨ Input string: " alibaba bali la" (double quotation marks doesn't count!)

Answer

1). Draw a Huffman tree and calculate average codeword length

Given: Input string: "gotoyooggy"



Probability of each word:

+ P(g) = 3/10 = 0.3

+ P(o) = 4/10 = 0.4

+ P(t) = 1/10 = 0.1

+ P(y) = 2/10 = 0.2

So, we can get codeword from tree: + o = 0 => $I_o = 1$
+ g = 10 => $I_g = 2$
+ y = 110 => $I_y = 3$

+ t = 111 => $I_t = 3$
=> E = 0.4x1 + 0.3x2 + 0.2x3 + 0.1x3 = 1.9 bits

2). Draw a Huffman tree and calculate average codeword length? If we have:

Input string: “alibaba bali la” (double quotation marks doesn’t count!)

⇨ Probability of each word: + P(a) = 5/15 = 0.33

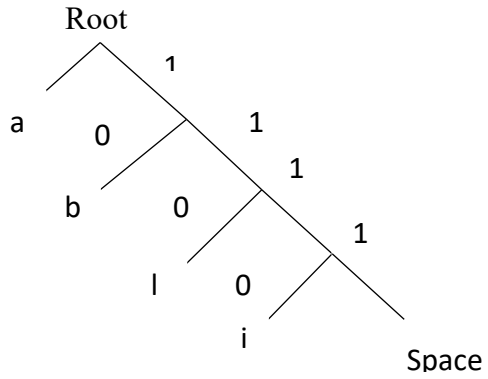
+ P(l) = 3/15 = 0.2

+ P(i) = 2/15 = 0.13

+ P(b) = 3/15 = 0.2

+ P(space) = 2/15 = 0.13

- Draw a Huffman tree by probability above:



So, we can get codeword from tree: + a = 0 => $I_a = 1$

+ b = 10 => $I_b = 2$

+ l = 110 => $I_l = 3$

+ i = 1110 => $I_i = 4$

+ space = 1111 => $I_{space} = 4$

E = 0.33x1 + 0.2x2 + 0.2x3 + 0.13x4 + 0.13x4 = 2.37 bits