

Indian Institute of Engineering Science and Technology, Shibpur.

Department of Information Technology

Data Structure Laboratory 2020

BATCH- HY

Due Date: 1.11.2020

Assignment 6

1. Write a program to implement Complete Binary Tree and Binary Search Tree (BST) on N number of integers taken as input. Also implement the in-order, pre-order and post-order traversal on both the trees.
2. Write a C program to implement Huffman Coding Scheme. Build a Huffman Tree from a given text taken as input and traverse the Huffman Tree by assigning 0 to the left branch of the tree and 1 to the right branch of the tree.

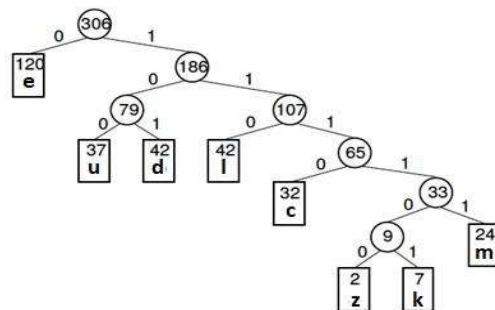
Huffman coding provides codes to characters/stings such that the length of the code depends on the relative frequency. Huffman codes are of variable-length, and without any prefix (that means no code is a prefix of any other). Any prefix-free binary code can be displayed or visualized as a binary tree with the encoded characters stored at the leaves.

Huffman tree or Huffman coding tree defines a full binary tree in which each leaf of the tree corresponds to a string in the given text.

As an example assume for a given text the frequency of each strings are as follows: (In the following table I used the words as the first letter of the words, say)

Words	z	k	m	c	l	e	u	d
Frequency	2	7	24	32	42	120	37	42

Using the frequency information I made the tree as follows. Start from words which have lowest frequency and merge them to get the root. The root node has the frequency of sum of the child nodes frequency. Continue till all the words are covered.



Words	z	k	m	c	l	e	u	d
H. Code	111100	111101	11111	1110	110	0	100	101

Now, you count the number of characters present in the original text file. If you replace each word by their respective codes then count how many characters will be in the coded file. Determine the reduced % of characters.