

Applications of Trees:

- Manipulate hierarchical data
- Make information easy to search.
- Manipulate sorted list of data.
- Router Algorithms
- folder hierarchy system in computer

Huffman Trees:

- It is a binary tree
- Provides codes to characters.
- Encoding and decoding is performed in Huffman tree.
- 2 types

fixed length encoding

variable length encoding

fixed length encoding:

- Assign a fixed value for set of characters.

Eg,

ASCII code.

Variable length encoding.

→ different character assigned with different values.

→ Assign frequency (Probability) to all characters.

→ find Codeword

Alg:

① Initialize Node 'n' based on probabilities

② Construct tree to find code word for characters.

Eg: Consider the five characters {A, B, C, D, -}
Construct Tree from the following

Character	A	B	C	D	-
Probability	0.35	0.1	0.2	0.2	0.15

step:

Consider Minimum probabilities from the above table, $B = 0.1$ & $- = 0.15$

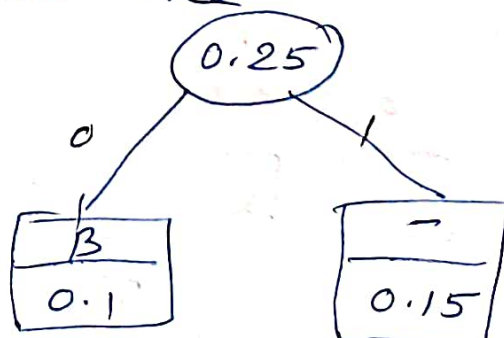
② Construct Tree

① Node Initializing:

B
0.1

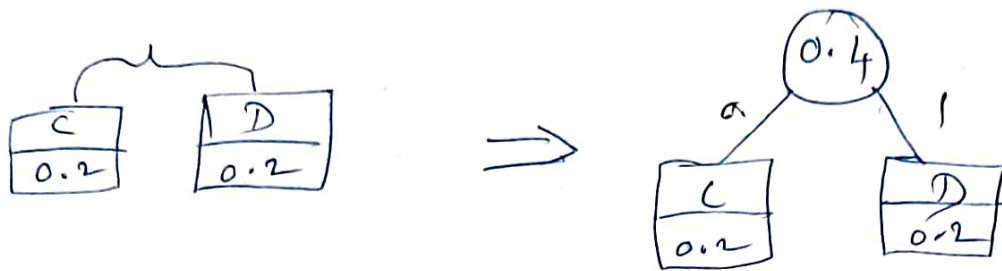
-
0.15

⇒

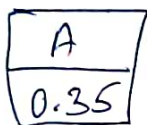


Next
② Minimum value

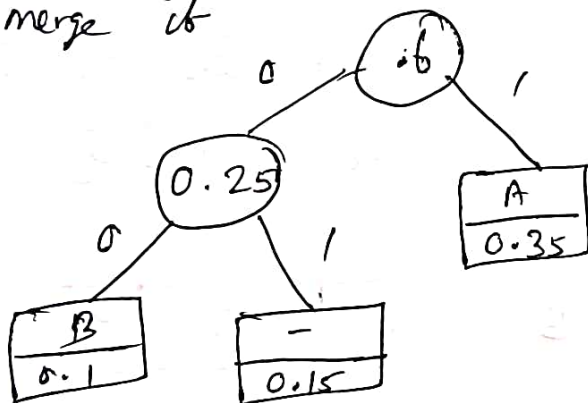
$$c = 0.2 \quad \& \quad D = 0.2$$



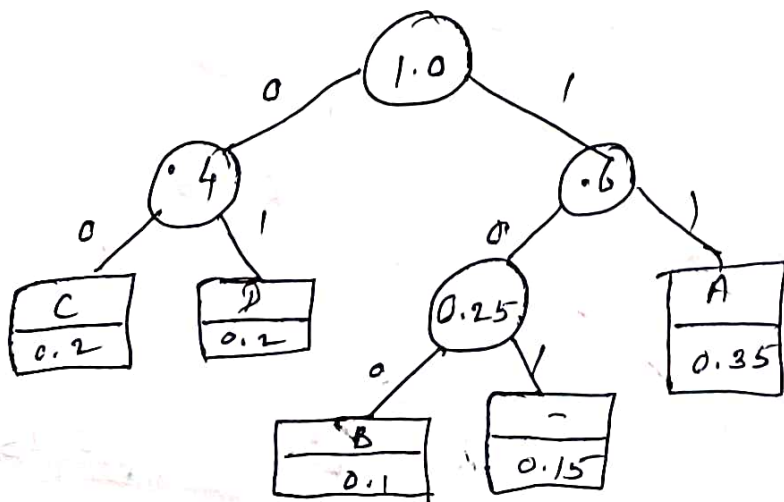
③



④ Compare step 1, 2, & 3 find minimum 2 values and merge it



⑤ Consider step 4 & step 2, then merge it



Character	A	B	c	D	-
Probability	0.35	0.1	0.2	0.2	0.15
Codeword	11	100	00	01	101