Lab 5

Let A = {a/20, b/15, c/5, d/15, e/45}

Frequency:

     A = 20
     B = 15
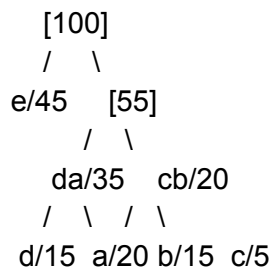   C = 5
     D = 15
     E = 45

Min frequency -> 5 + 15 = 20 (merge the two smallest)
Merge new node with next lowest (d) -> 20+15 -> 35
Merge with A -> 35+20 -> 55
Merge with last -> 55 + 45 -> 100

```
     [100]
     /   \
   e/45   [55]
         /  \
      da/35   cb/20
     / \  / \
   d/15 a/20 b/15  c/5
```

e=0
a=101
d=100
b=110
c=111

Average = (0.45 * 1) + (0.2 * 2)+(0.15 * 3)+(0.15 * 4)+(0.05 * 4) =2.1 bits/symbol

2. string: BABAABAAA.

A = 65 B =66

W	K	W+K	Out Code	New Entry	Assigned Code
""	B	B	–	–	–
B	A	BA	66	BA	256
A	B	AB	65	AB	257
B	A	BA	–	–	–
BA	A	BAA	256	BAA	258
A	B	AB	–	–	–
AB	A	ABA	257	ABA	259
A	A	AA	65	AA	260
A	""	–	65	–	–

Sequence = [66,65,256,257,65,65]

3. Delta compression works by storing only the differences between successive versions of data instead of storing the entire dataset.

How It Works

1. The first version of a file is stored completely.
2. Subsequent versions store only the changes between the old and new versions.
3. When retrieving a full version, the base version is reconstructed along with the stored differences.

Application

One common use case is version control systems like Git, where only the differences between commits are stored, significantly reducing storage requirements.