Huffman Coding → Variable length code.

ABCDEA → 6 chars. × 8 bits = 48 bits (Total)

Fixed length coding

5 unique characters

⇓

3 bits

000 - A
001 - B
010 - C
011 - D
100 - E

fixed length coding

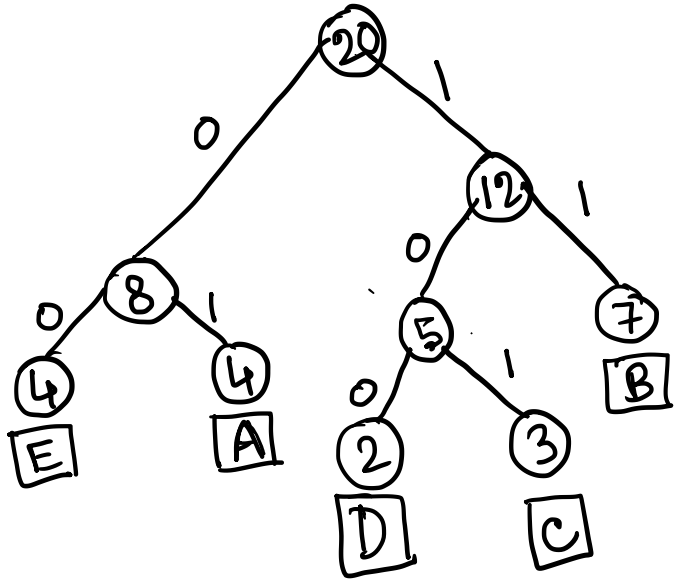
$6 \times 3 + 5 \times 3 + 5 \times 8$

$= 18 + 15 + 40$

$= 73$ bits

A B B C D B C C D A A B B E E E E B E A B ⇒ Data

Huffman coding



Chars	Freq.	Code
→ A	4	01
× B	7	11
✓ C	3	101
✓ D	2	100
→ E	4	00

$(4 \times 2 + 7 \times 2 + 3 \times 3 + 2 \times 3 + 4 \times 2) + (12 + 8 \times 5)$ ← ASCII

$= 45 + 52 = 97$ bits

Huffman coding follows prefix rule.

No code is prefix of another code.

A - 0
B - 1
C - 01

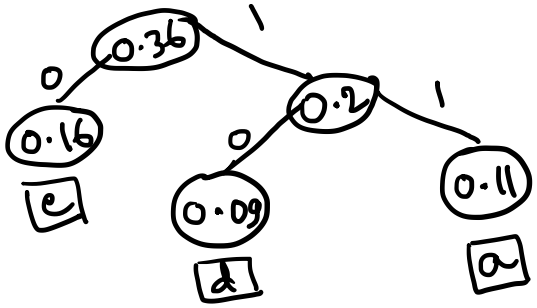
A's code

001

AAB AC

Not following prefix rule.

⇒ a, b, e, d, e characters

0.11, 0.4, 0.16, 0.09, 0.24 Probabilities

1 → Root node