

t - 00
 i - 111
 r - 110
 sp - 4
 g - 011
 h - 010
 w - 1011
 e - 1010

right write weight
 3 3 3 3 2 3 4 3 3 2 4 3 4 3 3 3 3 2
 54 bits
 7 bytes
 7 18 bytes

$$\frac{11}{18} \times 100 \text{ Avg.}$$

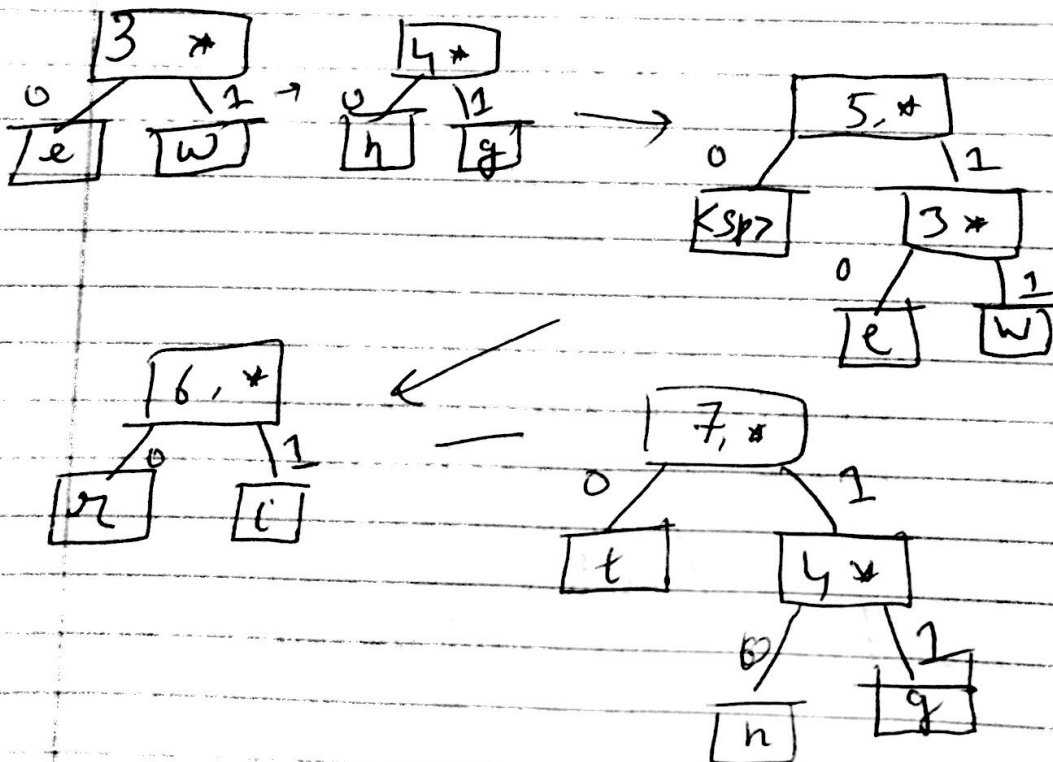
Sign | Sing | Singe
 2 3 2 2 4 2 3 2 2 4 2 3 2 2 4
 41 bits
 5 bytes
 10 bytes

$$\frac{11}{16} \times 100 \text{ reduction}$$

4. right write write

<sp>-2 r-3 i-3 g-2 h-2 t-3 w-2 e-1

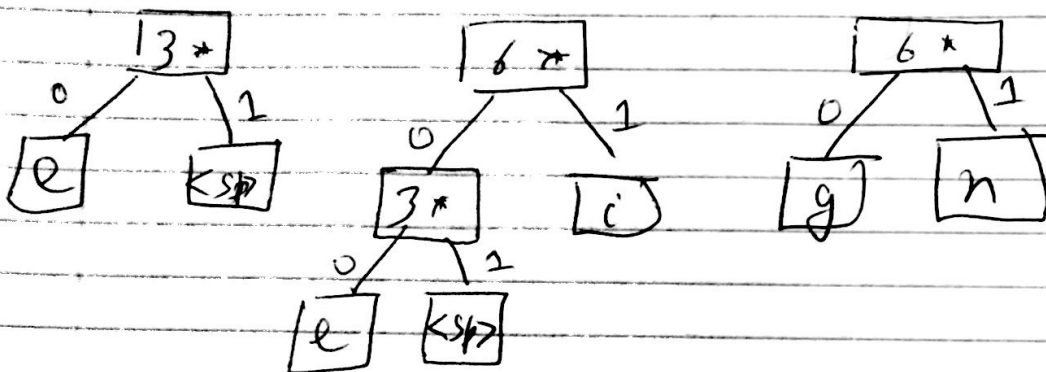
1 2 2 2 2 3 3 3
 e w h g <sp> r i t



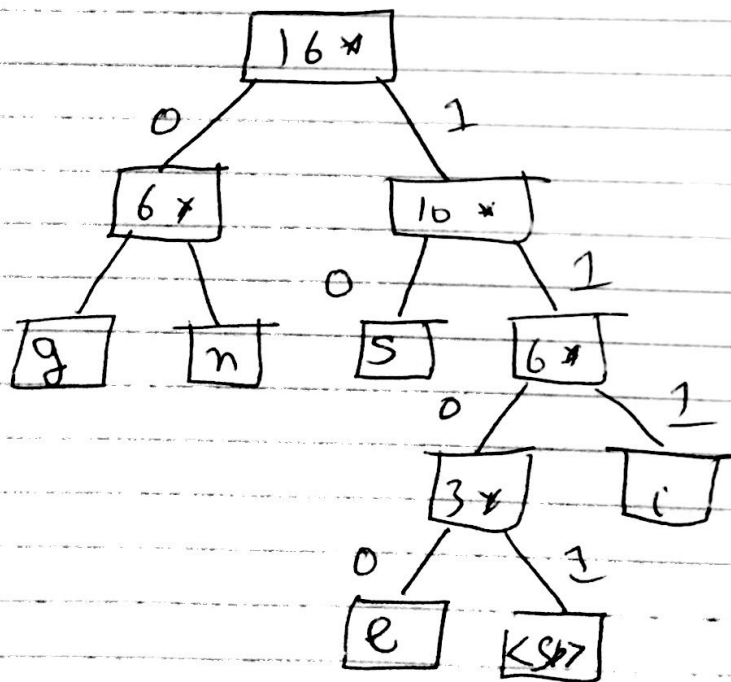
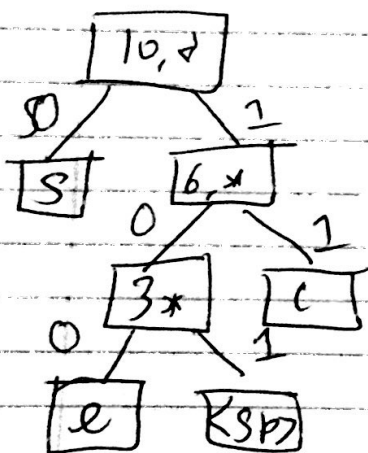
3. Sign Sing's Ange

<sp> - 2 s - 4 i - 3 g - 3 n - 3 e - 1

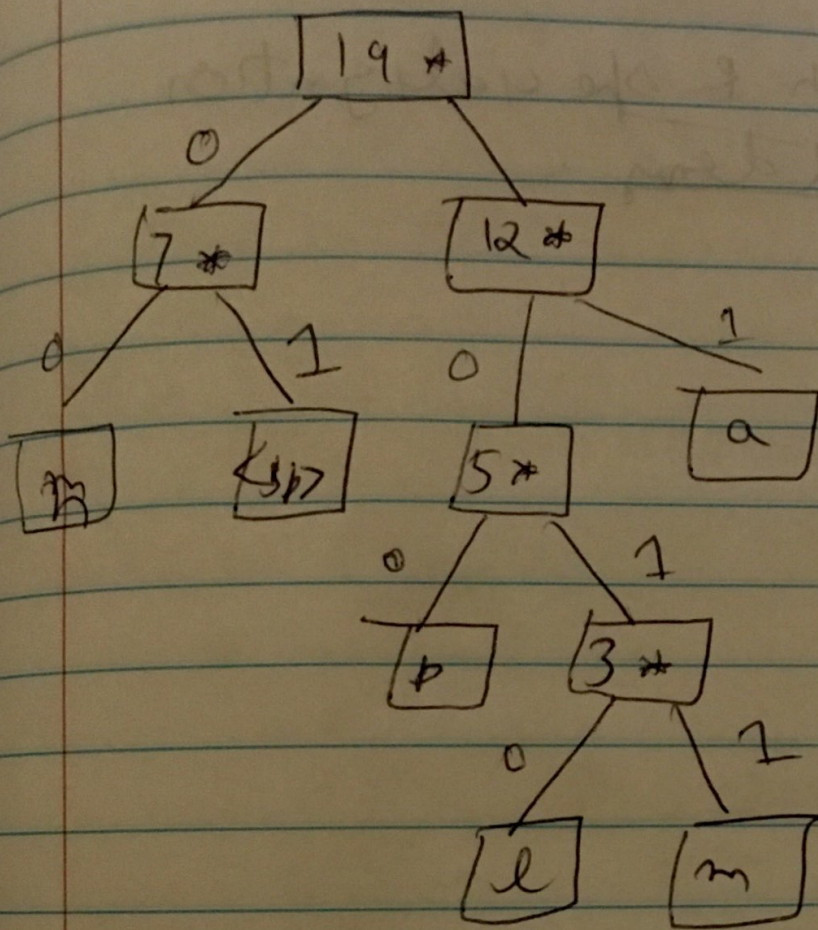
1 2 3 3 3 4
e <sp> i g n s



Final Tree



s - 01
n - 01
g - 00
i - 111
<sp> 1101
e - 1100



l - 1010

m - 1011

p - 100

n - 00

<sp> - 01

a - 11

a man a plan panama
2 4 2 2 2 3 4 2 2 3 2 2 2 4 2
3 8 bits

5 bytes

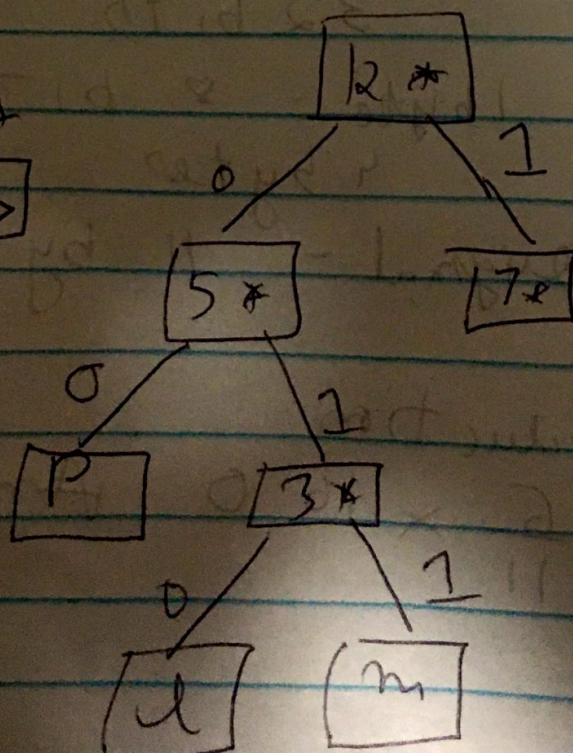
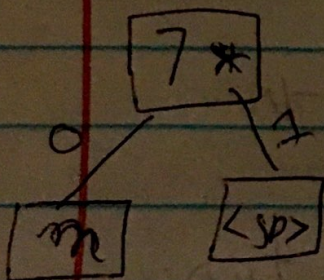
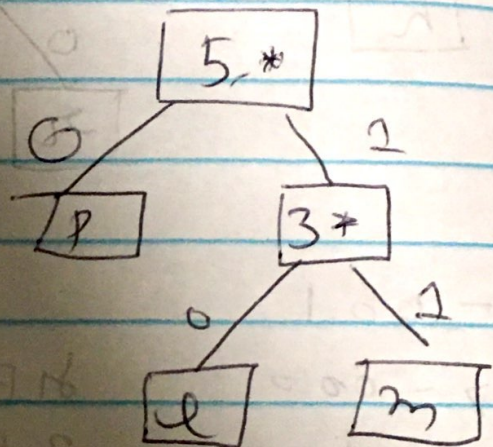
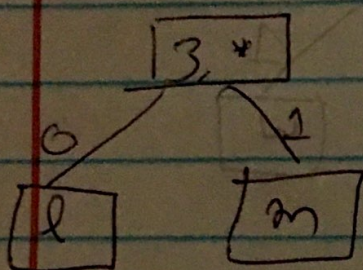
15

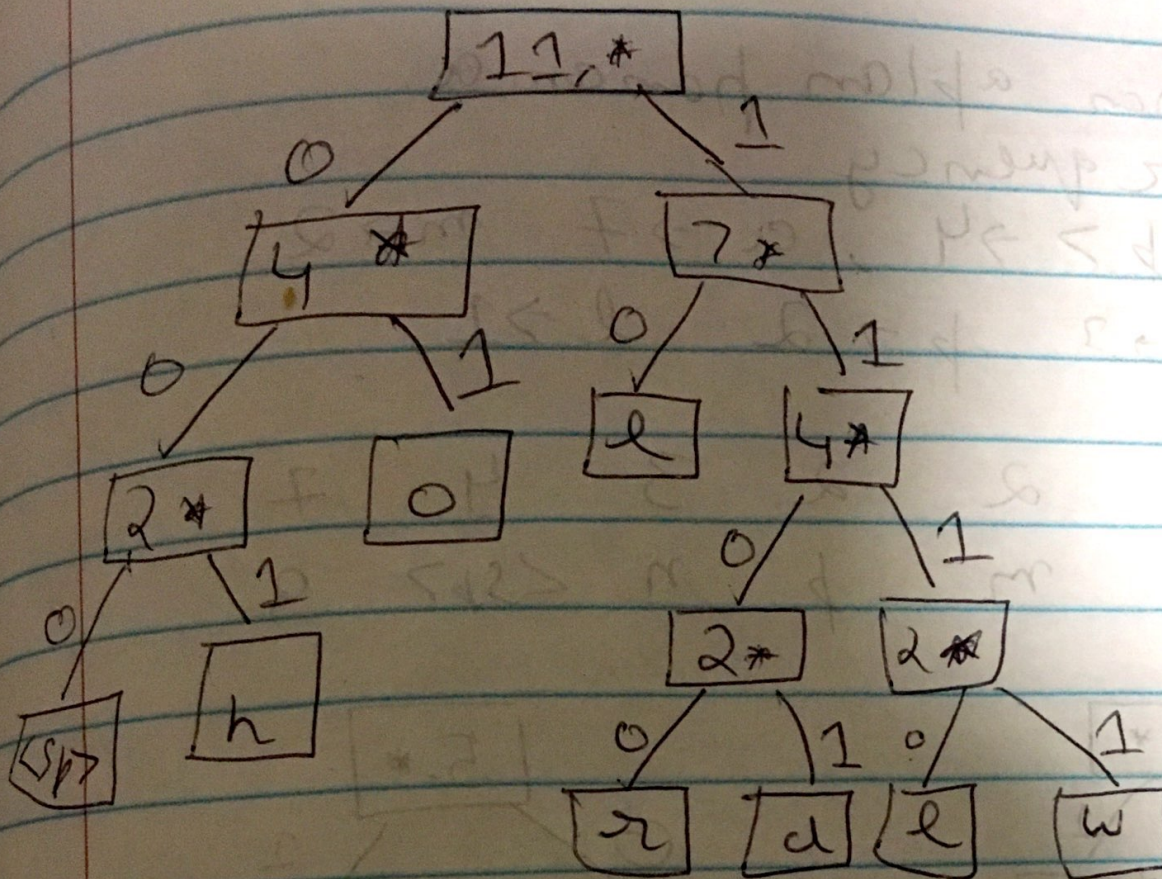
$\frac{10}{15} \times 100$ reduction.

2. a man aplan panam a.
frequency

$\langle sp \rangle \rightarrow 4$, $a \rightarrow 7$, $m \rightarrow 2$
 $n \rightarrow 3$ $p \rightarrow 2$ $l \rightarrow 1$

1 2 2 3 4 7
l m p n $\langle sp \rangle$ a.





h - 001
 <Sp> - 000
 0 - 01
 e - 10
 r - 1100
 d - 1101
 l - 1110
 w - 1111

HELLO WORLD
 3 4 2 2 2 3 4 2 4 2 4
 32 bits

1 byte = 8 bits
 4 bytes

Original - 11 bytes.

Total reduction

$\frac{6}{11} \times 160$ Ans.

① hello world
frequency.

<sp>-1 h-1, e-1, l-3, o-2, w-1, r-1,
d-1

1	1	1	1	1	1	2	3
<sp>	h	e	w	r	d	o	l

