CS-731 - MFCN

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Exam-2

2 Sol) Average customer arrives at book store per each hour = 45/hour

= 45/60 Mins

So $\lambda = 0.75$ mins

And the avg duration of customer visit to store is 20 Mins. $T = 20$ Mins

Now, the avg no. of customers will be in the store, on avg at any given time

$N = \lambda T$

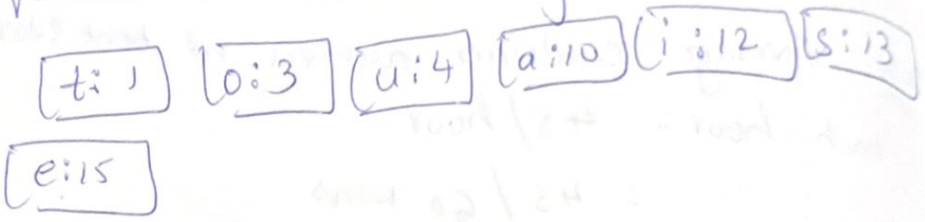
$= 0.75 \times 20$

$\boxed{N = 15}$

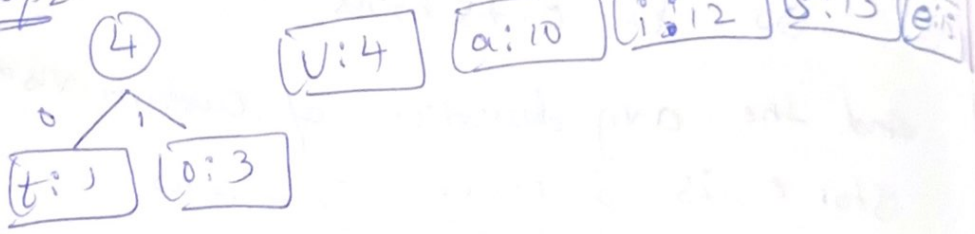
Therefore, on avg there will be 15 customers in the store at any given time.

3 Sol

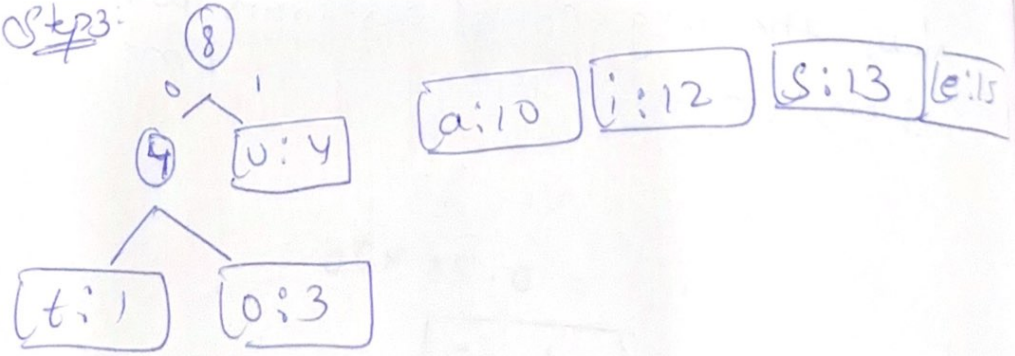
Here we go with Step 1:- Write the given frequencies in the ascending order



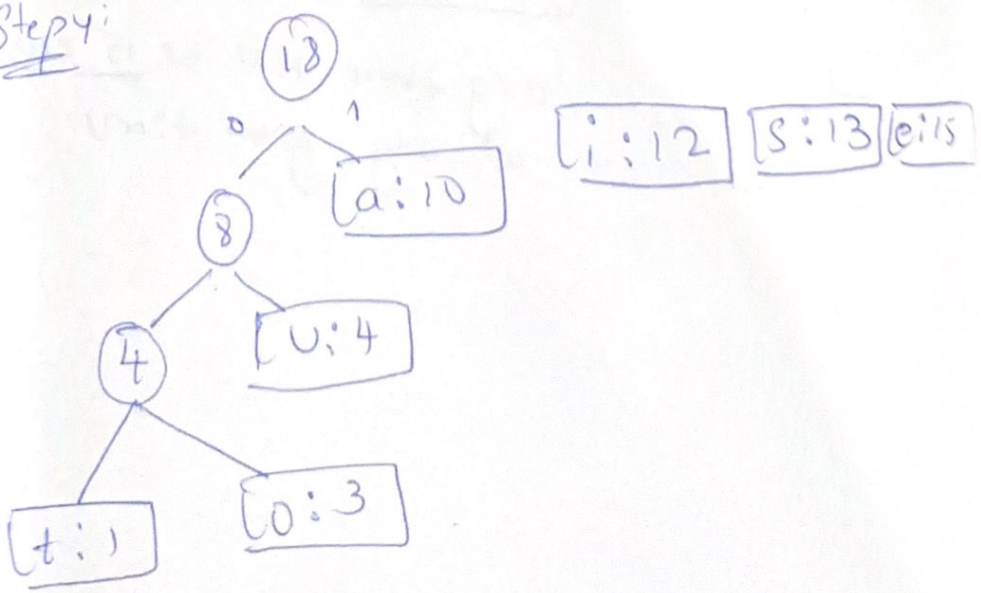
Step 2:-



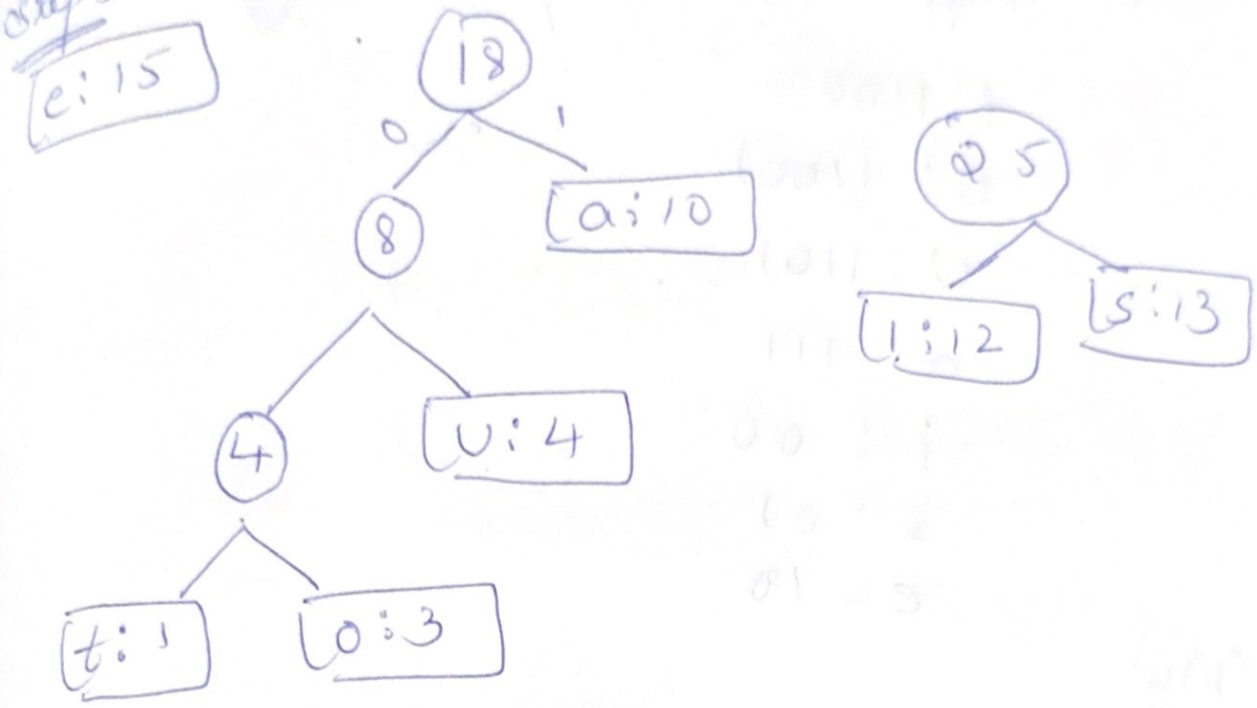
Step 3:-



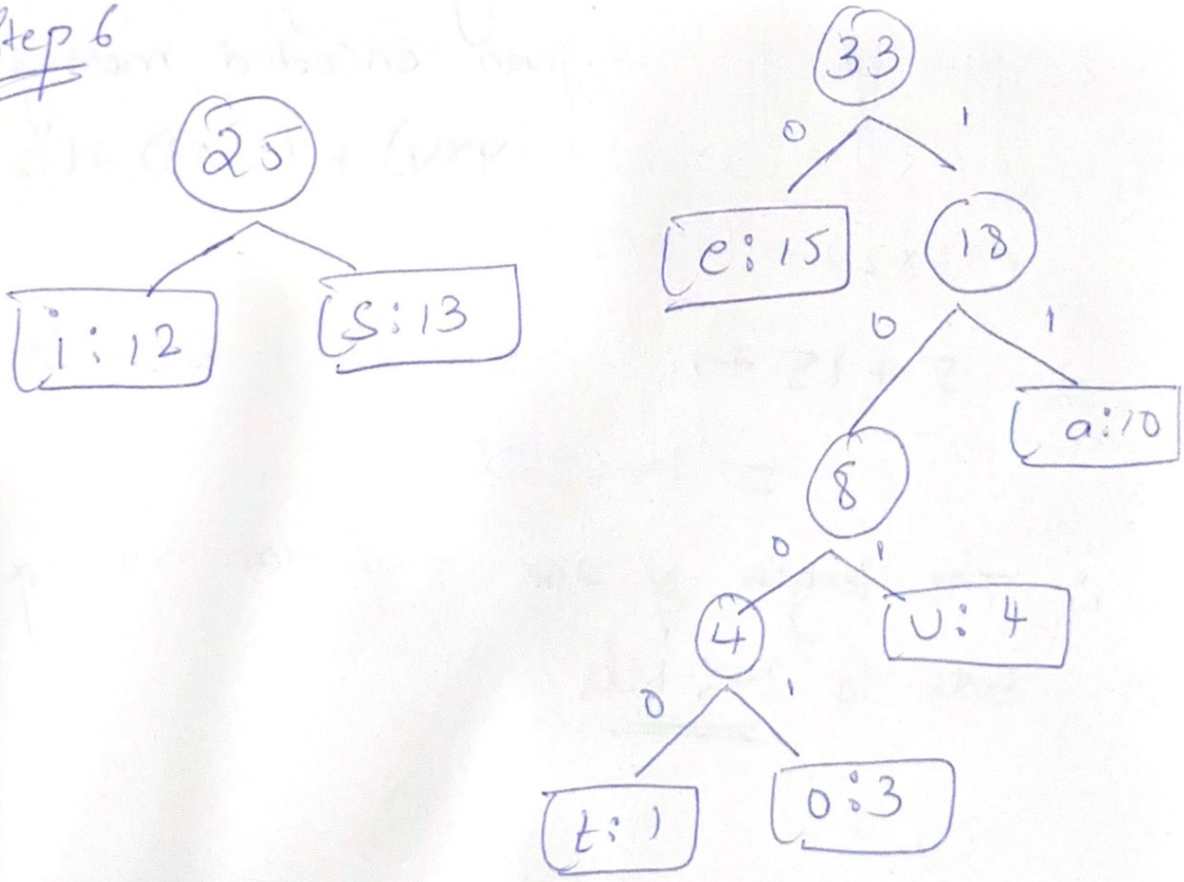
Step 4:



Step 5


e:15
18
0
1
8
a:10
4
u:4
t:1
o:3
25
1:12
s:13

Step 6


25
1:12
s:13
33
0
1
e:15
18
0
1
a:10
8
0
1
4
u:4
0
1
t:1
o:3

The Huffman code for the given characters

t: 11000

o: 1100

u: 110

a: 111

i: 00

s: 01

e = 10

(b) Sol

In the above given problem

Length of the Huffman encoded message is

$\Rightarrow (1\times5) + (3\times5) + (4\times4) + (10\times3) + (12\times2) + (13\times2) + (15\times2)$

$= 5 + 15 + 16 + 30 + 24 + 26 + 30$

$= 146$ bits

∴ The length of the Huffman message in bits is 146 bits.

150) In the given problem

if $x_i = 1$, the site i is choosen to drilling

$x_i = 0$, site i will not be choosen drilling.

∴ The objective function you acquire at to

maximise $= \sum_{i=1}^{10} P_i x_i$

$\rightarrow x_i \geq 0$, for $i = 1, 2, 3 \ldots 10$

$\rightarrow x_i \leq 1$ for $i = 1, 2, 3 \ldots 10$

$\Rightarrow \sum_{i=1}^{10} x_i = 5$

(a) In the above problem

if q is choosen, do $x_q = 1$

then site 2, must also be choosen, so that $x_2 = 1$

the site q is choosen, then site 2 must be choosen

$\Rightarrow x_2 \neq 0$, when $x_q = 1$

$$\boxed{x_2 - x_q \geq 0}$$

(b) So) It is as in above given problem site 1 & 8 both are choosing

$\therefore x_1 = 1$, & $x_8 = 1$

then site 3 cannot be choosen so $x_3 = 0$

$$x_1 + x_8 + x_3 \leq 2$$

(c) So) It is given as the above problem site 6 or site 7 either is choosen, so $x_6 = 1$, $x_7 = 1$, then site 10 cannot be choosen, so $x_{10} = 0$

$$x_6 + x_{10} \leq 1$$
$$x_7 + x_{10} \leq 1$$