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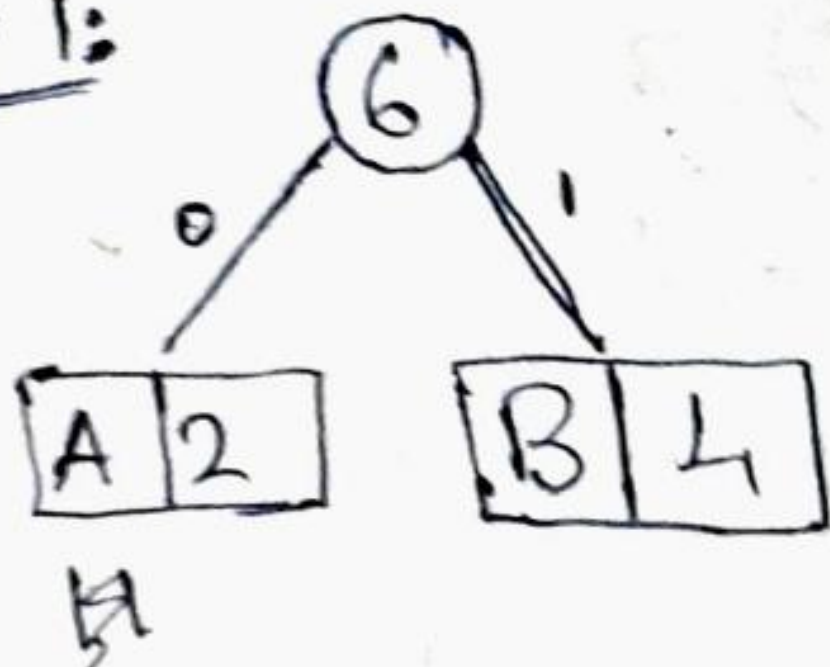
Course : Design of Algorithms

① Huffman codes for following symbols:

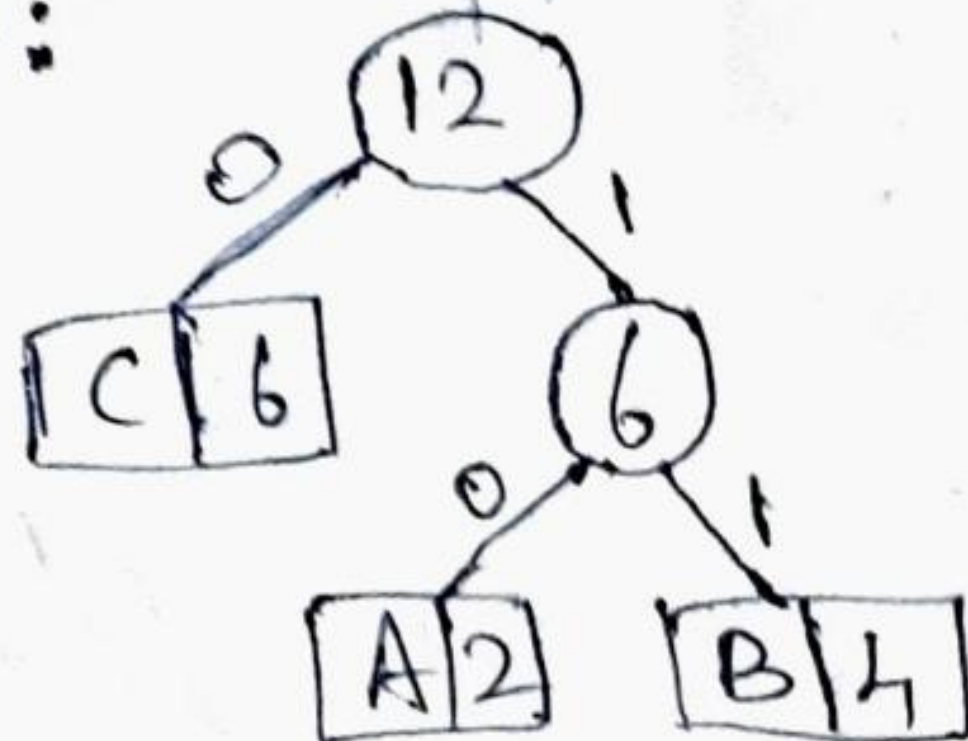
a	b	c	d	e	f	i	→ Symbols
2	4	6	8	10	12	26	→ frequency

Huffman Tree

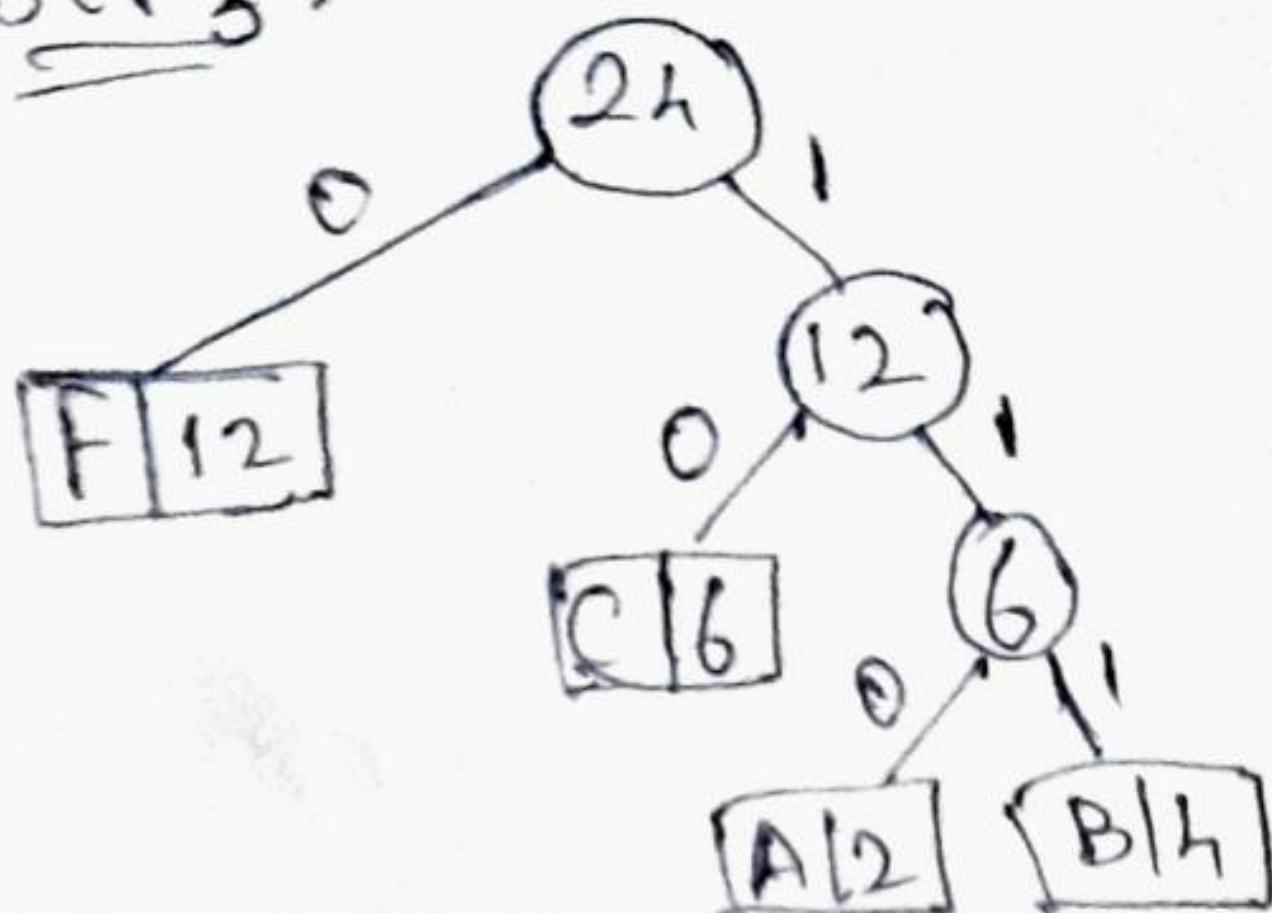
Step 1:



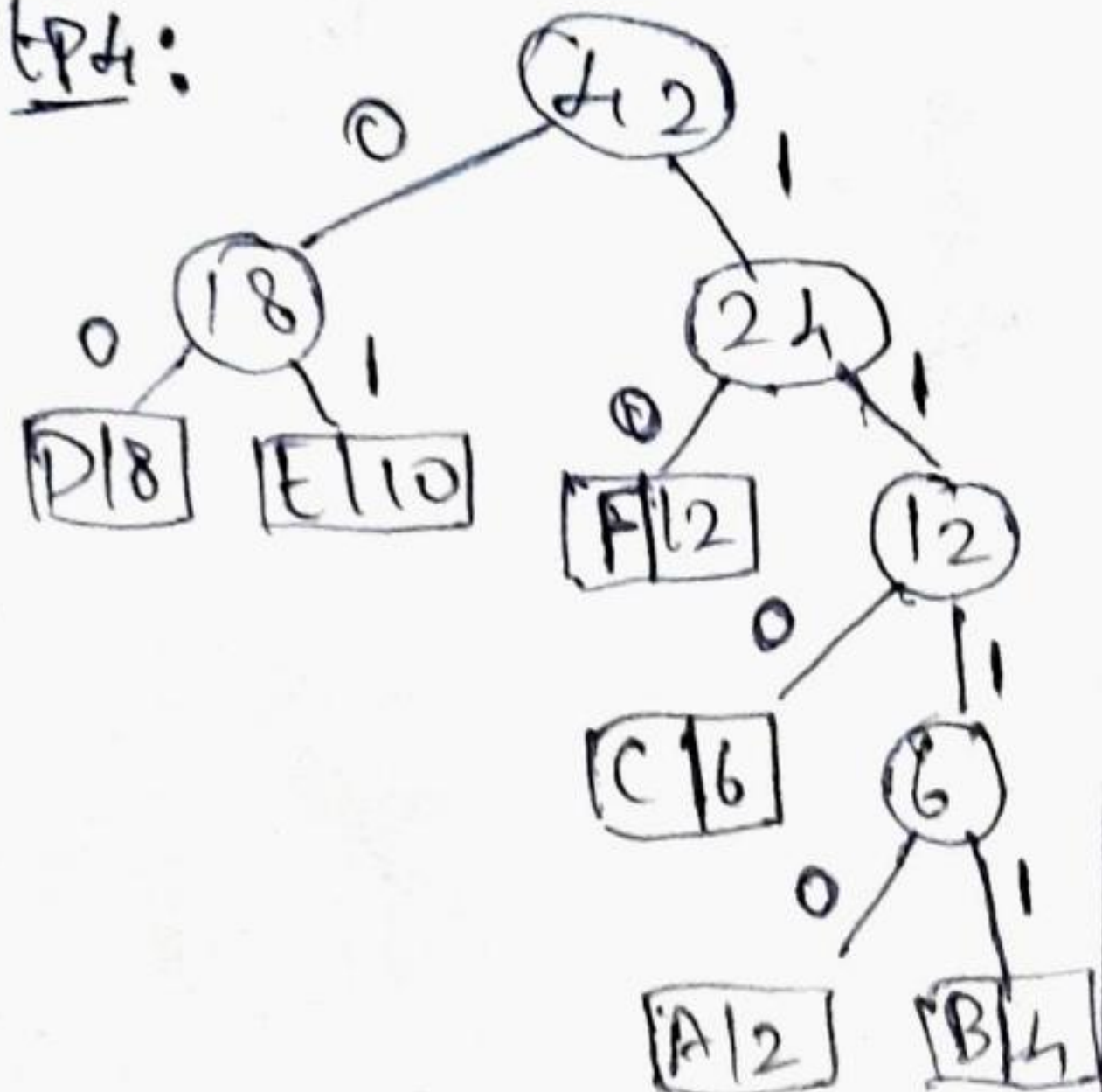
Step 2:



Step 3:

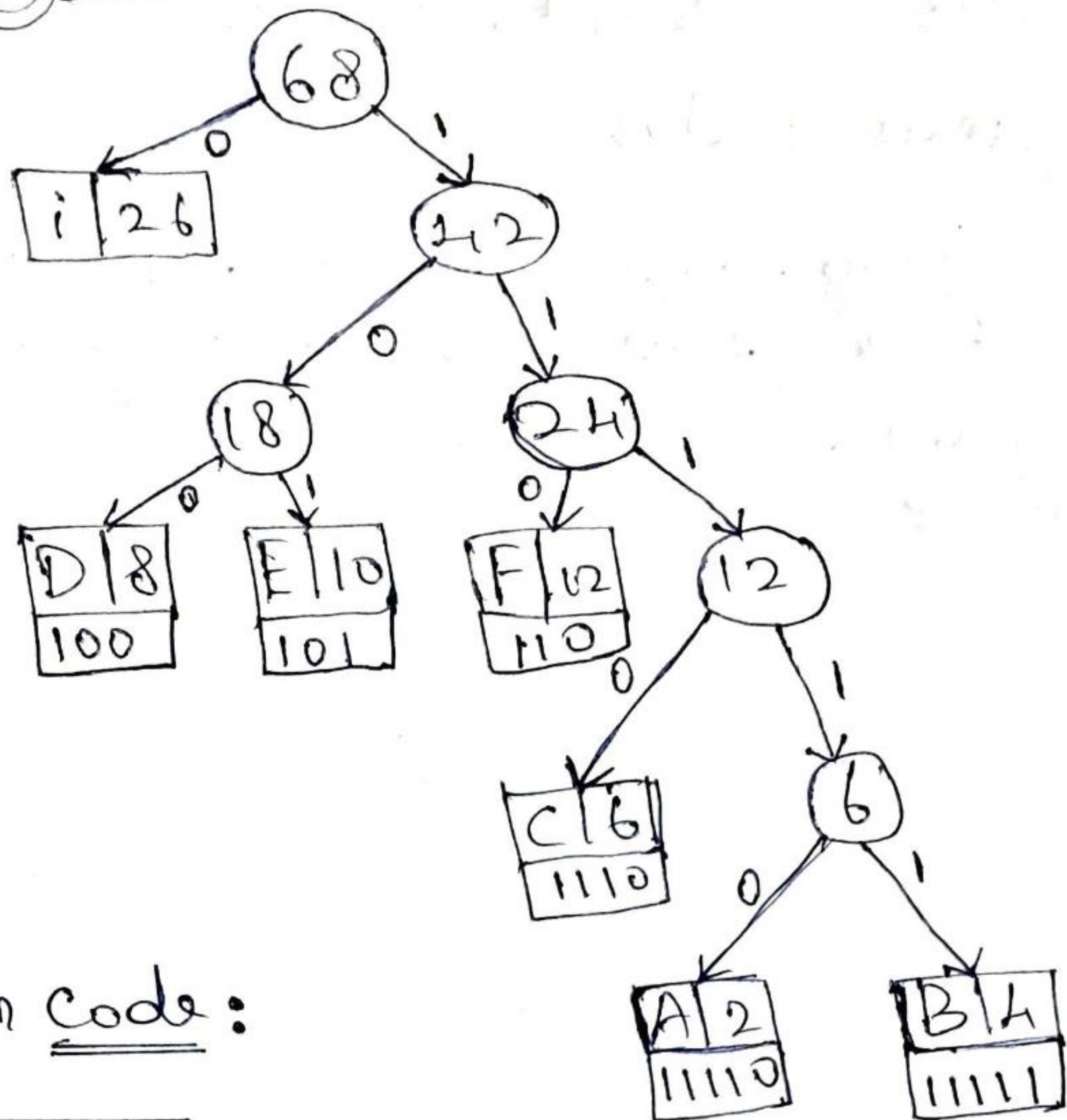


Step 4:





# Final Huffman Tree



Huffman Code:

a	11110
b	11111
e	1110
d	100
e	101
f	110
i	0



2) Design Huffman codes for the following text.

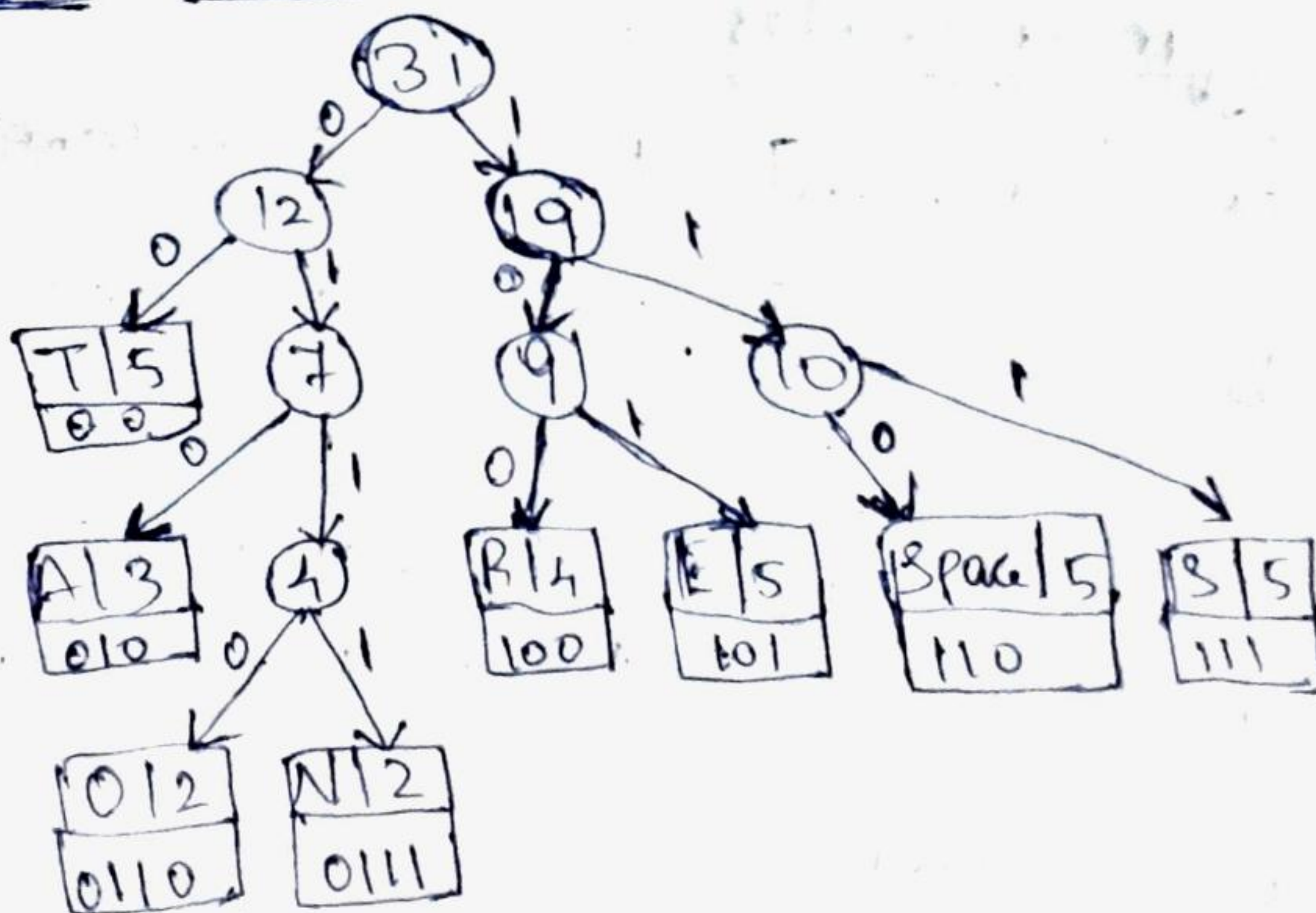
a) Text = "Streets are stone stars are not"

S	t	r	e	a	o	n	space
5	5	4	5	3	2	2	5

In Ascending order,

n	o	a	r	s	t	e	space
2	2	3	4	5	5	5	5

Huffman tree



Huffman code:

n	o	a	r	s	t	e	space
0111	0110	010	100	11	00	101	110



Huffman text: "streets are stone stars  
are not".

Code  
↓

#

$\frac{111}{s} \frac{00}{t} \frac{100}{r} \frac{101}{e} \frac{101}{e} \frac{00}{t} \frac{111}{s} \frac{110}{space} \frac{010}{a} \frac{100}{r} \frac{101}{e} \frac{110}{space}$

$\frac{111}{s} \frac{00}{t} \frac{010}{o} \frac{011}{n} \frac{101}{e} \frac{110}{space} \frac{111}{s} \frac{00}{t} \frac{010}{a} \frac{100}{r} \frac{111}{s} \frac{110}{space}$

$\frac{010}{a} \frac{10010}{r} \frac{110011}{e space n} \frac{0110}{o} \frac{00}{t}$

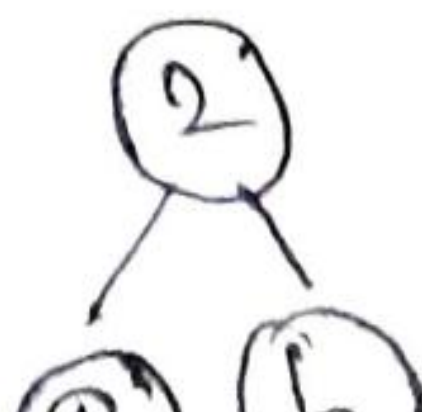
②) ⑥ Text = "go go gophers"

g	o	p	h	e	r	s	space
3	3	1	1	1	1	1	2

Ordering

~~g o p h e r s~~

e	h	p	s	r	space	g	o
1	1	1	1	1	2	3	3





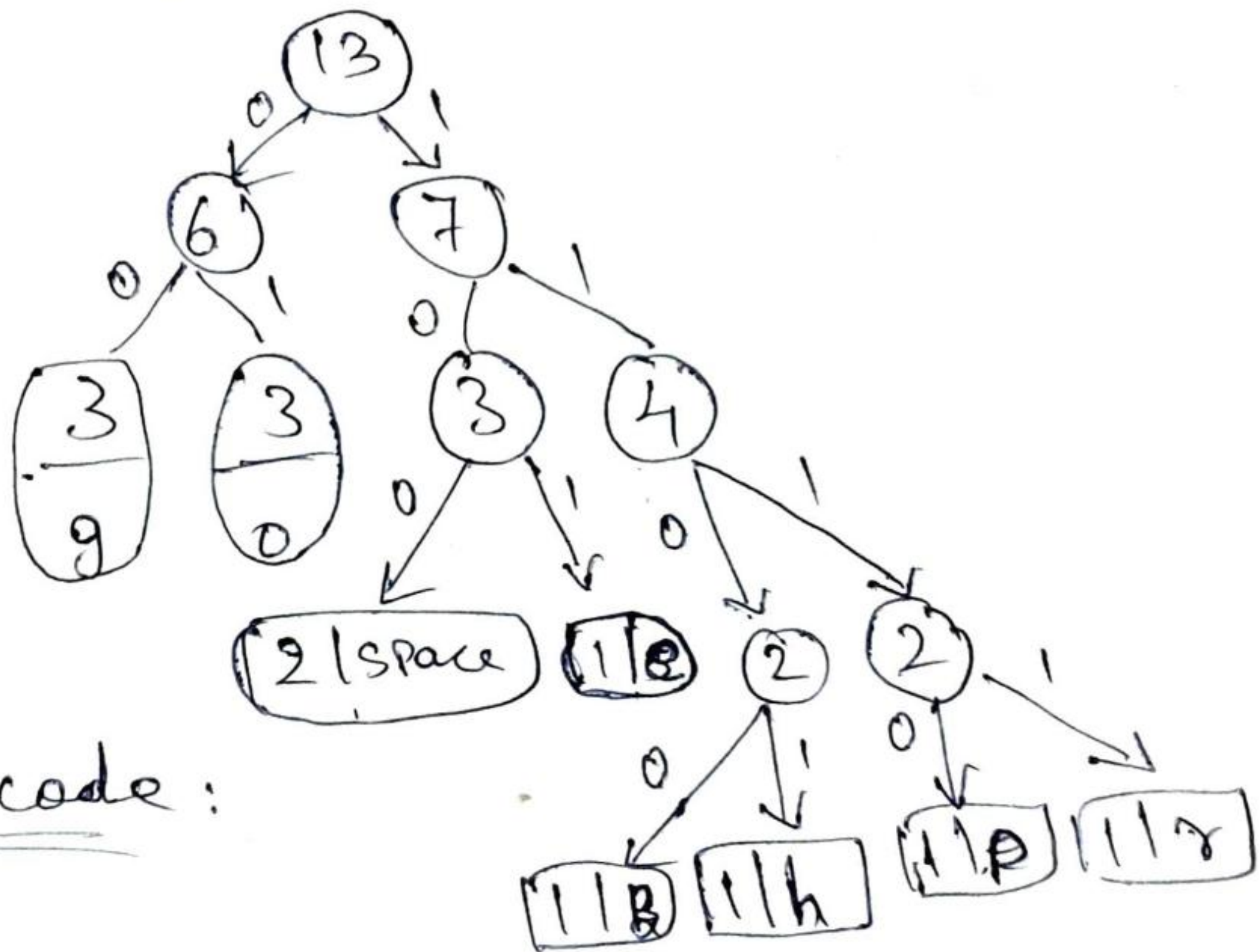
(26) "Go go gophers"

g o p h e r s space  
3 3 1 1 1 1 1 2

Ordered

e r p h s space g o  
1 1 1 1 1 2 3 3

Huffman tree



Human code:

g = 00

o = 01

space = 100

s = 1100

p = 1110

e = 101

r = 1111

h = 1101

~~Text~~  
~~00 01 00 01~~  
~~g o g o~~

Text

00 01 100 00 01 100  
g o space g o space

00 01 1110 1101 101 1111 1100  
g o p h e r s