Huffma Tree ___ (useful in coding if we want to send a ①
message.)

Fixed sized codes
✓ Variable sized codes

Size of 3 bits for each symbol   W(000), X(001), Y(100) Z(101)

So XYZXWXY = 001 100 10 100 000 001 100   (21 bits)
                                                (3×7)

But if   W(110), X(0), Y(10), Z(111), then

XYZXWXY = 0 10 111 0 110 0 10   (13 bits)

Huffman tree gives minimum weighted path lengths,
hence generating minimum codes.
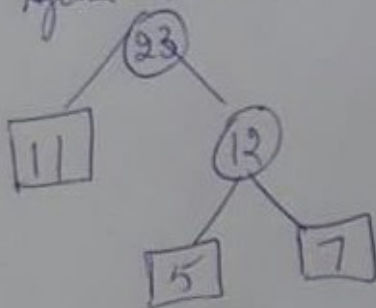
            A   B   C   D   E   F   G
weight/   16 11 7   20 25 5   16
Frequency
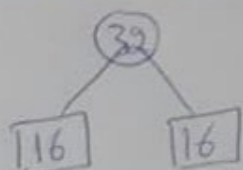
Take two nodes with minimum
weights.
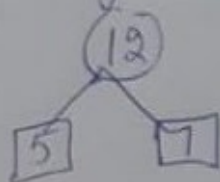
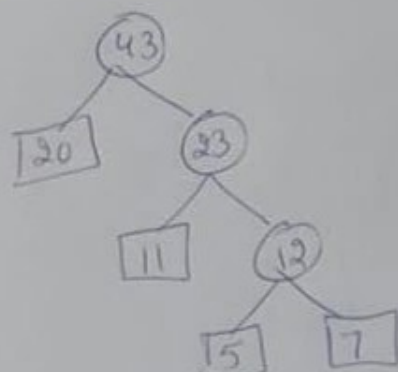(12)   16, 11, 12, 20, 25, 16
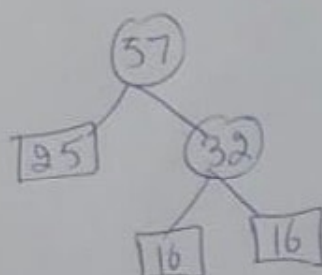5   7

Again take two minimum ones.

(23)   16, 23, 20, 25, 16
11   (12)
     5   7

②

(32)
[16] [16]

32, 23, 20, 25

(43)
[20] (23)
[11] (12)
[5] [7]

32, 43, 25

(57)
[25] (32)
[16] [16]

43, 57

(100)
0 / \ 1
(43) (57) 1
0 / \1 0/ \
[20] (23) [25] (32)
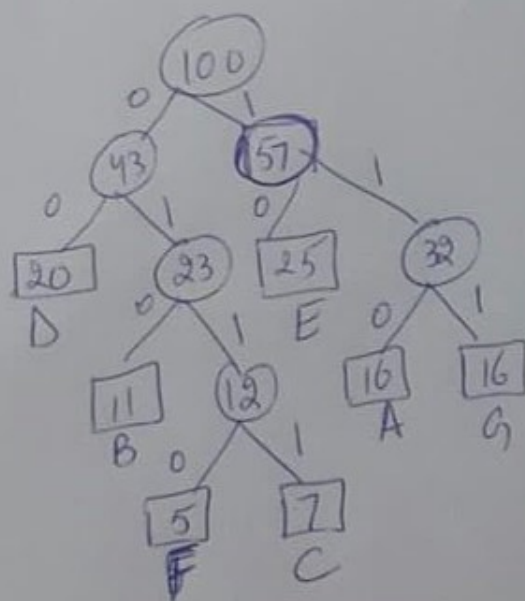D 0/ \1 E 0/ \1
 [11] (12) [16] [16]
 B 0/ \1 A   G
  [5] [7]
  F   C

Left Branch = 0
Right Branch = 1
Start the code from the
Root of the tree up til the
node.

Huffman tree:

Symbol	Code
A —	110
B —	010
C —	0111
D —	00
E —	10
F —	0110
G —	111

Different, so we
cannot omit
back 0 of F to
shorten the code.

The truncation of back
zeros do not affect the
other codes, those
could be removed to
shorten the codes further.