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Q.1: Sort the given list using
insertion sort

56, 59, 45, 40, 43, 55

Solution :-

We know that

Steps:

$$n = 6$$

$$n - 1$$

$$6 - 1$$

$$n = 5$$

Step # 1. Element = 59

56, (59), 45, 40, 43, 55

Step # 2.

Element = 45

56, (59), (45), 40, 43, 55

56, 45, 59, 40, 43, 55

45, 56, 59, 40, 43, 55

Step # 3.

Element = 40

45, 56, (59), (40), 43, 55

(2)

45, (56), (40), 59, 43, 55

(45), (40), 56, 59, 43, 55

40, 45, 56, 59, 43, 55

Step # 4.

Element = 43

40, 45, 56, (59), (43), 55

40, 45, (56), (43), 59, 55

40, (45), (43), 56, 59, 55

40, 43, 45, 56, 59, 55

Step # 5.

Element = 55

40, 43, 45, 56, (59), (55)

40, 43, 45, (56), (55), 59

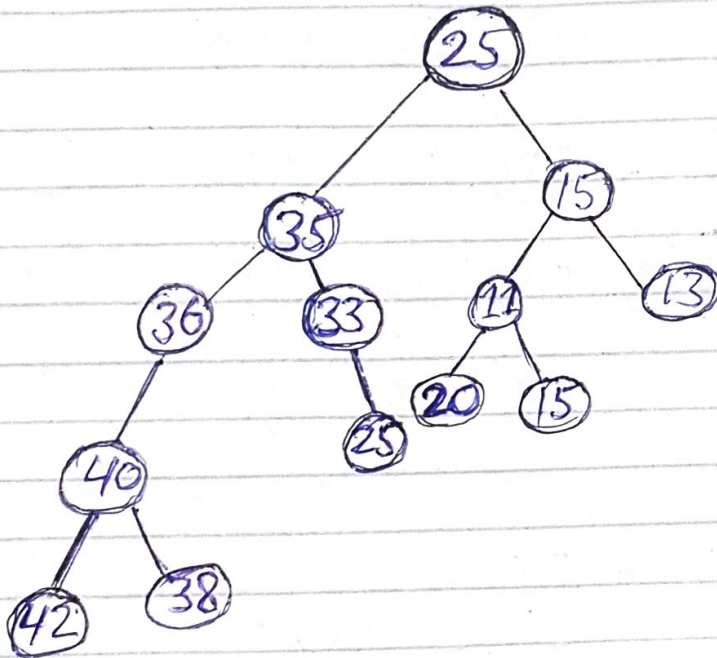
40, 43, 45, 55, 56, 59

(3)

Q.2) Construct binary Tree from given list of number & then verify the tree

25, 15, 35, 17, 33, 36, 25, 13, 15,
40, 38, 42, 20

Sol:



Verify the tree

42, 40, 38, 36, 35, 33, 25, 25,

20, 17, 15, 15, 13

14)

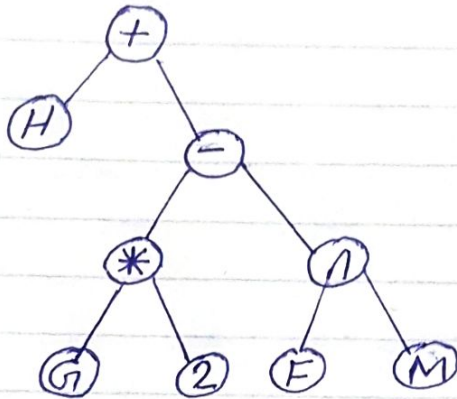
Q.3: Construct binary tree from given Mathematical Expression

(i) $H + G * 2 - (F \wedge M)$

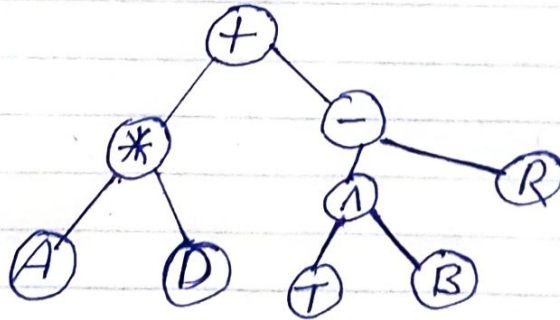
(ii) $A * D + T \wedge B - R$

(i)

$H + G * 2 - F \wedge M$



(ii) $A * D + T \wedge B - R$



(5)

Q.4 Apply all tree binary tree Reversal techniques on each of the tree constructed in Q#3.

i) In-order-Traversal

H, +, G, *, 2, -, F, ^, M

ii) Pre-order-Traversal

+, H, -, *, G, 2, ^, F, M

iii) Post-order-Traversal

H, G, 2, *, F, M, ^, -, +

i) In-order-Traversal

A, *, D, +, T, ^, B, -, R

ii) Pre-order-Traversal

+, *, A, D, -, ^, T, B, R

iii) Post order Traversal

A, D, *, T, B, ^, R, -, + (Answer)

Q.5 Fill in the blanks

- 1) Element of a tree are called Node
- 2) The graphical line drawn between nodes of a tree is called Edge
- 3) level number of a root is 0
- 4) All the nodes with some level number belong to same
- 5) The left-Most-child is oldest brother node
- 6) The right-Most-child is Youngest brother node
- 7) A Tree is a Non-linear Data structure
- 8) An ordered set of ordered Tree is called a Forest