

Day: MTWTFSS

Date: \_\_\_/\_\_\_/\_\_\_

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program

BSEE

Subject

• Data Structure

Teacher

Sir M. Adil.

Q1 Sort the Given list Using Insertion sort.

56, 59, 45, 40, 43, 55

Solution

Total numbers are 6  
Total numbers of steps  
we know that

$$\text{Steps} = \text{total} - 1$$

$$6 - 1 = 5 \text{ steps}$$

Step #1

element = 59

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

proper position no change

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

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)

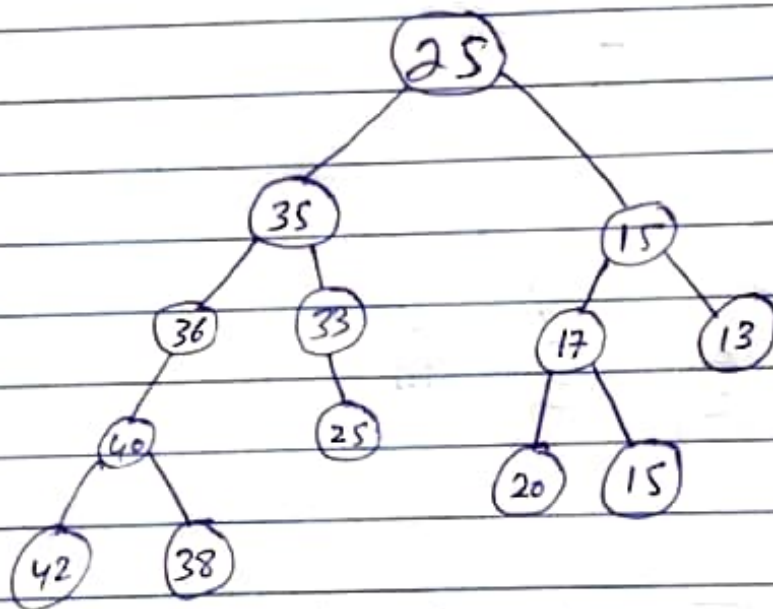
40, 43, 45, (56), (55), 59

40, 43, 45, 55, 56, 59 Answer.

Q2 Construct Binary trees from given list of numbers & then verify the trees.

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

Solution



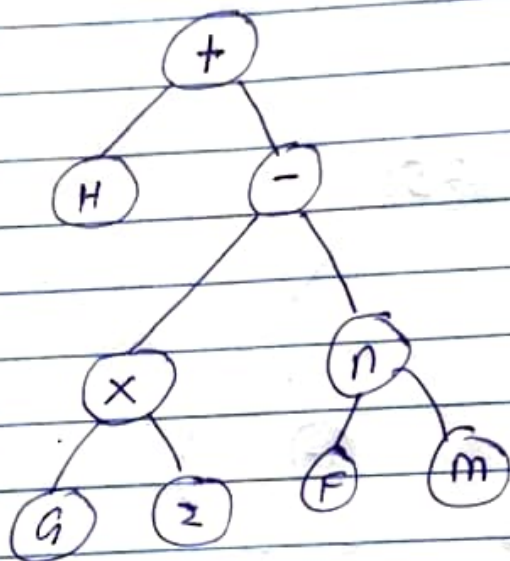
verification: Using In order Traversal

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

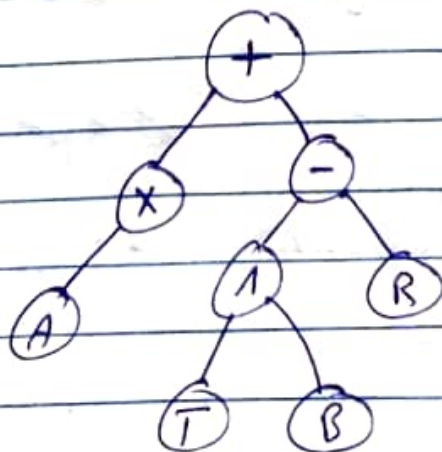
Answers.

Q3 Construct Binary trees from mathematical expressions.

(i)  $H + (2 \times 2) (F \wedge M)$



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



Q4 Apply all the tree binary trees Traversal techniques on each of the tree constructed in Question 3?

① (i) H, +, (7, x, 2, F, A, M, -

(ii) +, H, -, x, (7, 2, A, F, M

(iii) H, (7, 2, x, F, M, A, -, +

② (i) A, x, d, +, T, A, B, -, R

(ii) +, x, A, d, -, A, T, B, R

(iii) A, D, x, T, B, A, R, -, +

Q5 Fill in the blanks.

① elements of a tree are called Node.

2 The graphical line drawn between nodes of a tree is called Edge.

3 level number of root is First subset.

4 All the nodes with same level number belong to same family.

5 The most left child node is older node.

6 The Right most child node is younger node.

7 A Tree is a non-Linear data structure.

8 an ordered set of ordered tree is called a Forest.