



SNS COLLEGE OF TECHNOLOGY

Coimbatore-35

An Autonomous Institution



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Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai

COURSE NAME : 19ITT201 & Data Structures

II YEAR/ III SEMESTER

UNIT – I LINEAR DATA STRUCTURES & TREES

Topic: Expression trees

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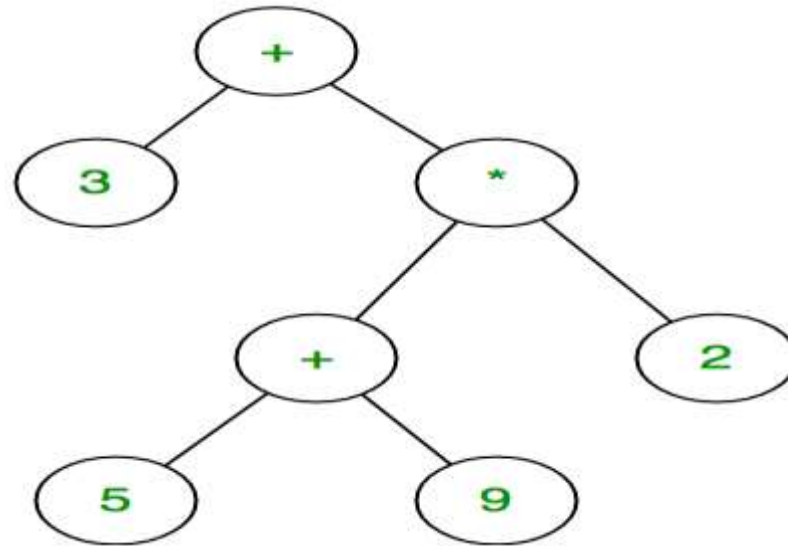
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Expression Tree

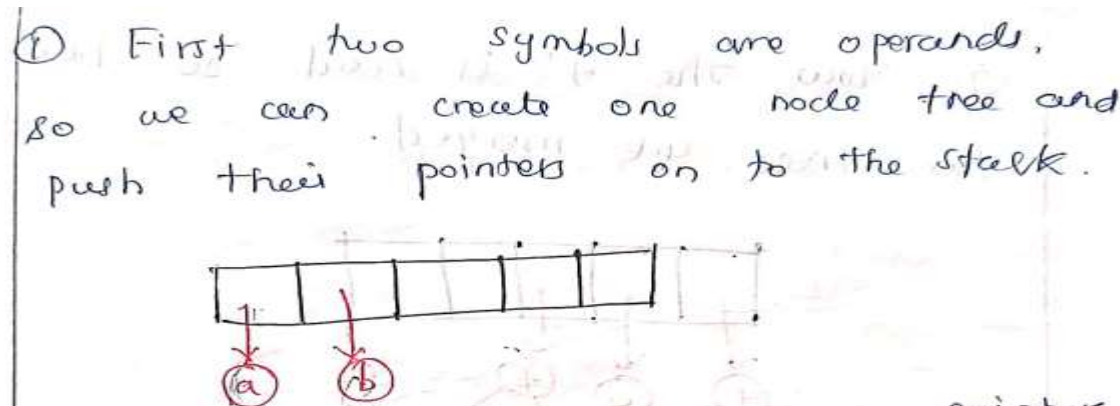
- Expression tree is a binary tree in which the leaf nodes are operands and the interior nodes are operators
- example expression tree for $3 + ((5+9)*2)$ would be:





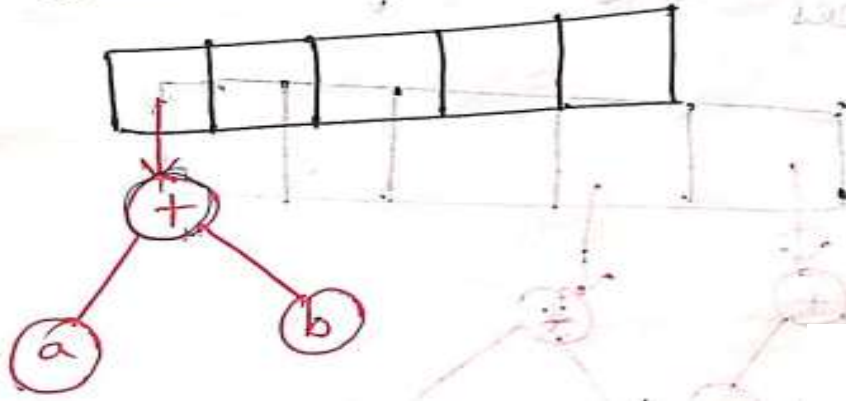
Construction of Expression Tree

- Now For constructing an expression tree we use a stack. We loop through input expression and do the following for every character.
 - If a character is an operand push that into the stack
 - If a character is an operator pop two values from the stack make them its child and push the current node again.
- Example
 - $ab+cde+**$



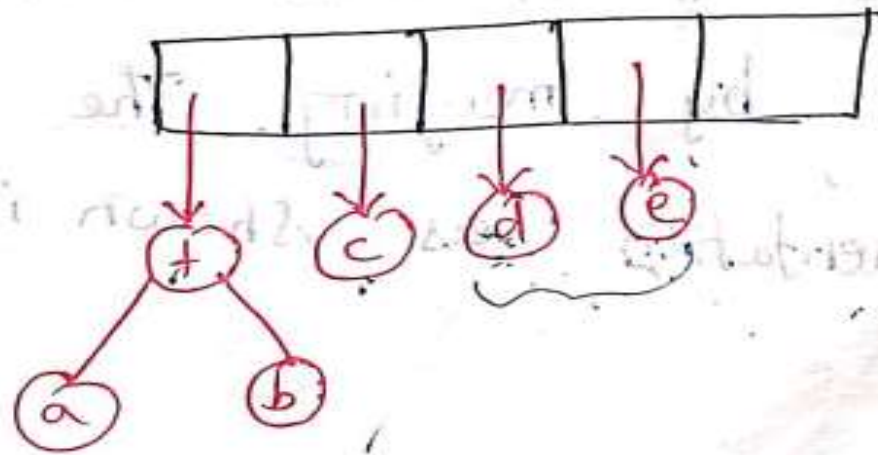


② Next '+' sign is read, two pointers are popped a new tree is formed and a pointer is again pushed on to the stack.



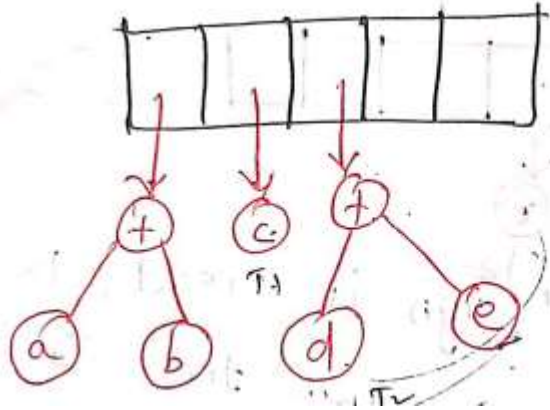


③ Next the operators c, d, e are read and for each one node tree is created and a pointer to the corresponding tree is pushed on to the stack.

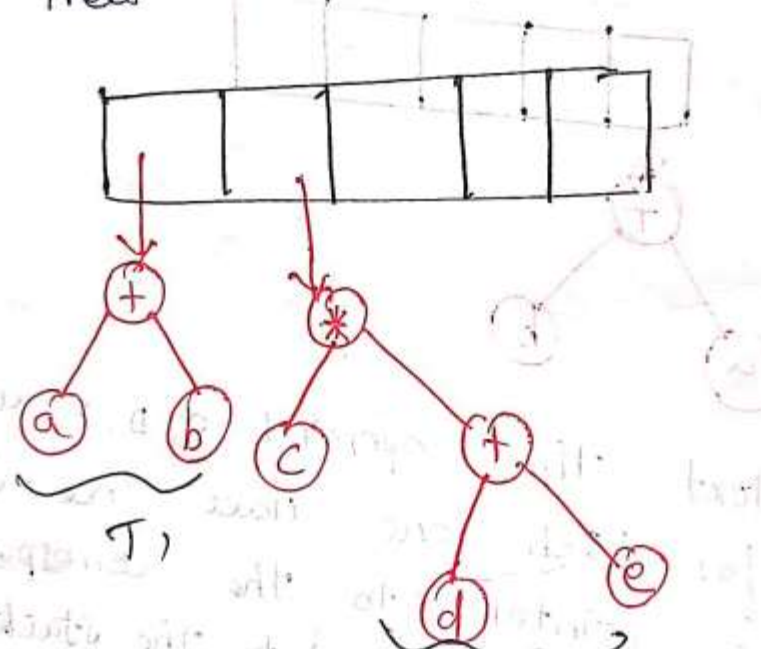




(4) Now the '+' is read so last two trees are merged.

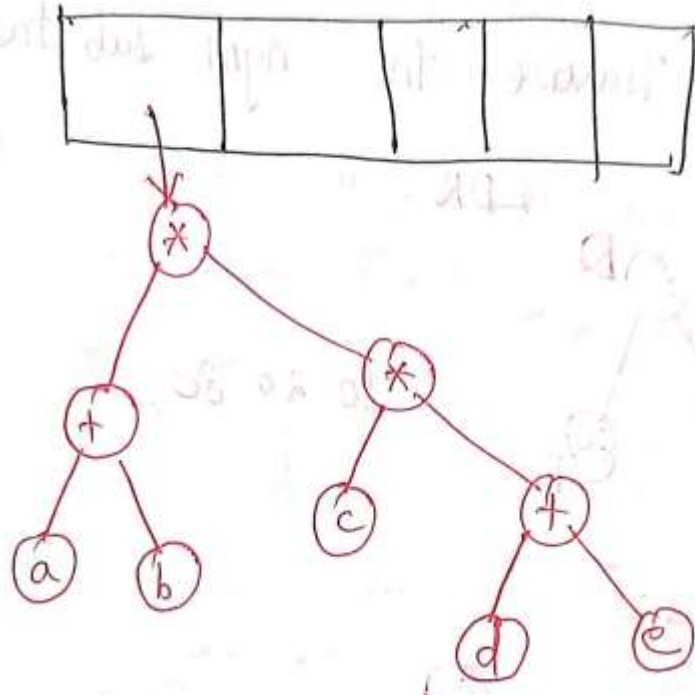


(5) Now the '*' is read so the last two trees are merged.





⑥ Now the $*$ is read and tree is formed by merging. The final representation is shown in figure.





References



- Java : the complete Reference (Eleventh Edition), Herbert Schildt, 2018.

