

- Tree Traversal -



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لا يكتب في هذا الهامش

Infix, Postfix and Prefix

infix $A \oplus B$	$A + (B * C)$	$(A + B) * (C + D)$	$A + B + C + D$
Postfix $AB \oplus$	$ABC * +$	$AB + CD + *$	$AB + C + D +$
Prefix $\oplus AB$	$+ A * BC$	$* + AB + CD$	$+++ ABCD$

• example Convert $A + (B * C)$ from infix to Postfix

$$A + (B * C) \rightarrow A (BC) * + \rightarrow ABC * +$$

• exple evaluate postfix $23 + 8 * \rightarrow (2 + 3) 8 * \rightarrow 5 * 8 = 40$

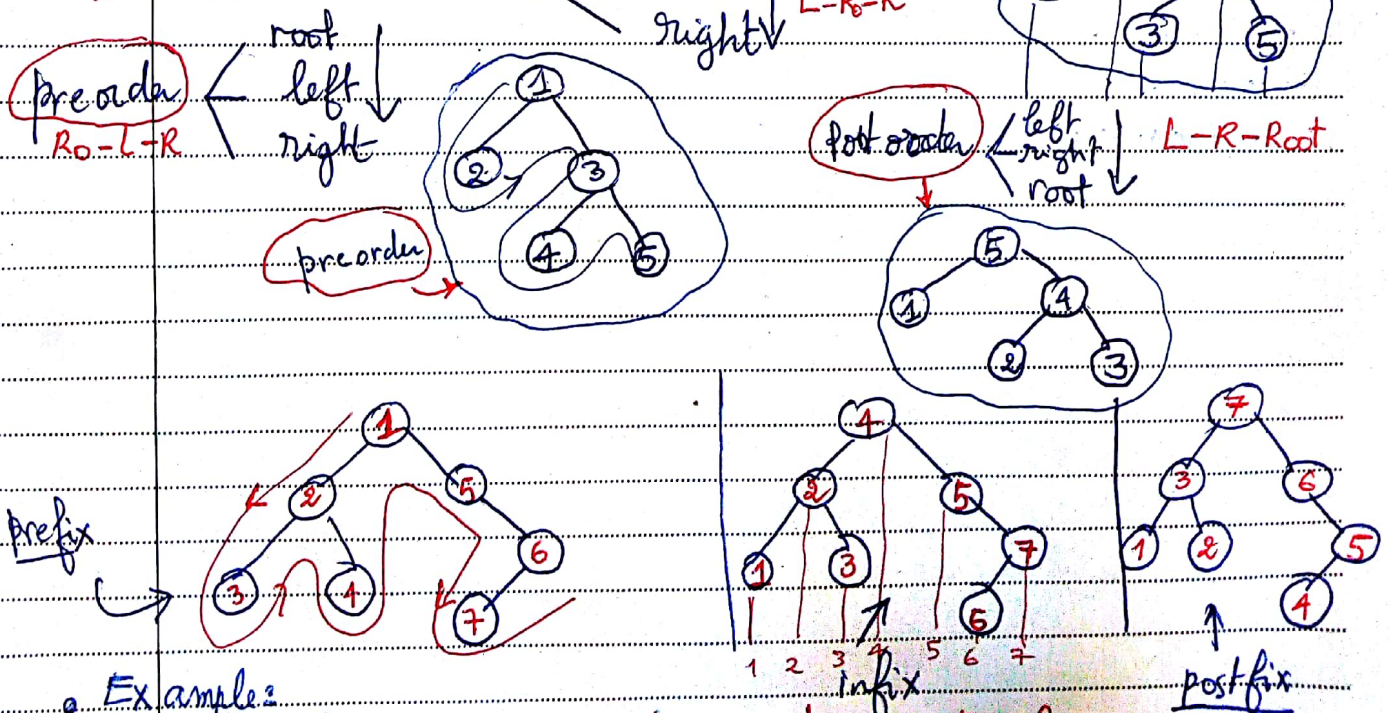
• exple Convert $a + b * c + (d * e + f) * g$ to postfix :

infix

$$a + bc * + (de * + f) * g \rightarrow abc * + de * f + g *$$



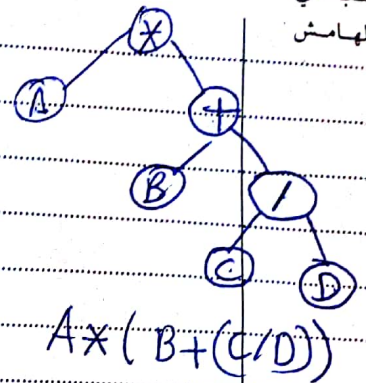
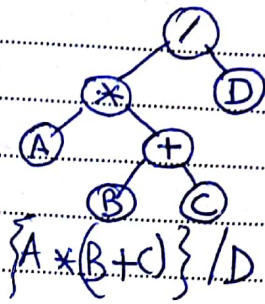
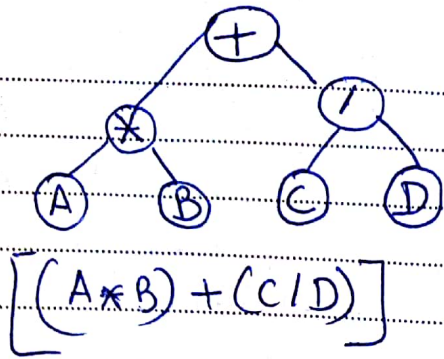
★ Traversal tree



• Example:

	<u>Infix</u>		<u>Postfix</u>		<u>Prefix</u>
multiply A and B	$(A * B) + (C / D)$	\rightarrow	$AB * CD / +$	\rightarrow	$+ * AB / CD$
divide C by D	$A * (B + C) / D$	\rightarrow	$ABC + * D /$	\rightarrow	$/ * A + BCD$
Add B and C	$A * (B + C) / D$	\rightarrow	$ABCD / + *$	\rightarrow	$* A + B / CD$
divide C by D	$A * (B + C) / D$	\rightarrow	$ABCD / + *$	\rightarrow	$* A + B / CD$

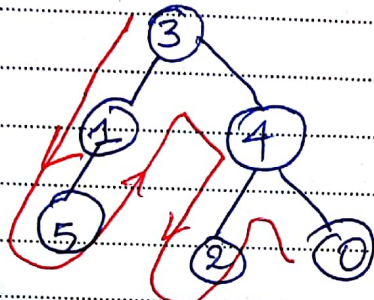
infix



لا يكتب في هذا الهامش

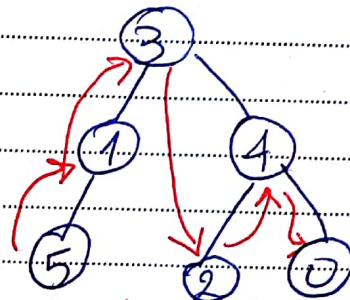
• example:

prefix



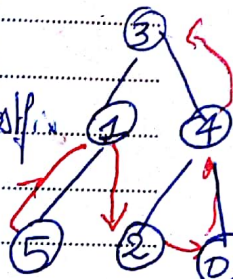
3/1/5/2/4/0
root - Left - Right

infix



5/1/3/2/4/0
Left - Root - Right

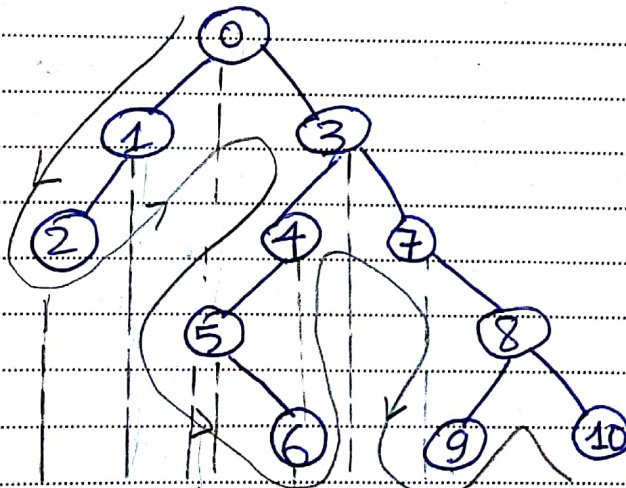
postfix



Left - Right - Root
5/2/1/0/4/3

• example:

Write preorder, inorder and postorder for the following tree:



↳ preorder: 0 / 1 / 2 / 3 / 4 / 5 / 6 / 7 / 8 / 9 / 10 .

↳ inorder: 2 / 1 / 0 / 5 / 6 / 4 / 3 / 7 / 9 / 8 / 10 .

↳ children first postorder: 2 / 1 / 6 / 5 / 4 / 9 / 10 / 8 / 7 / 3 / 0 .