

27/7/24

① Infix to postfix:

Infix Expression : $A * (B * C + D * E) + F$:

S.No	Current token	Operator stack	Postfix string
1	A		A
2	*	*	A
3	(	*(	A
4	B	*(	AB
5	*	*(*)	AB
6	C	*(*)	ABC
7	+	*(+)	ABC*
8	D	*(+)	ABC* D
9	*	*(+*)	ABC* D
10	E	*(+*)	ABC* DE
11	)	*	ABC* DE * +
12	+	+	ABC* DE * + *
13	F	+	ABC* DE * + * F
14			ABC* DE * + * F +

Postfix Expression is: $ABC* DE* + *F +$

② Infix Expression: $A * B^c + D$

S.No	Current token	Operator stack	Postfix string
1.	A		A
2.	*	*	AB
3.	B	*	AB
4.	^	* ^	ABC
5.	C	* ^	ABC^*
6.	+	+	ABC^* D
7.	D	+	ABC^* D +
8.			

Postfix Expression: $ABC^* D +$

③ Postfix to Infix

Postfix Expression: $AB - DE + F * /$

S.No	Reading of Postfix	stack top	Expression
1	A	A	<div style="border: 1px solid black; padding: 2px; display: inline-block;">A</div>
2	B	B	<div style="border: 1px solid black; padding: 2px; display: inline-block;">B A</div>
3	-	A - B	<div style="border: 1px solid black; padding: 2px; display: inline-block;">A - B</div>
4	D	D	<div style="border: 1px solid black; padding: 2px; display: inline-block;">D A - B</div>
5	E	E	<div style="border: 1px solid black; padding: 2px; display: inline-block;">E D A - B</div>
6	+	D + E	<div style="border: 1px solid black; padding: 2px; display: inline-block;">D + E A - B</div>
7	F	F	<div style="border: 1px solid black; padding: 2px; display: inline-block;">F D + E A - B</div>
8	*	((D + E) * F)	<div style="border: 1px solid black; padding: 2px; display: inline-block;">(D + E) * F A - B</div>
9	/	((A - B) / ((D + E) * F))	

Infix Expression: $(A - B) / ((D + E) * F)$

Postfix conversion : $abc * de - / +$

S.No	Symbol	Stack
1	a	a
2	b	ab
3	c	abc
4	*	a(b*c)
5	d	a(b*c)d
6	e	a(b*c)de
7	-	a(b*c)(d-e)
8	/	a((b*c)/(d-e))
9	+	(a + ((b*c)/(d-e)))

Infix Conversion : $(a + ((b * c) / (d - e)))$

5) Balanced symbols:
 $((a+b) * (c-d))$

S.No	Symbol	Stack	Action Token	Expression So far
1	(	(	Push '('	(
2	(	((	Push '('	((
3	a	((	Append 'a'	((a
4	+	((	Append '+'	((a+
5	b	((	Append 'b'	((a+b
6	)	(	pop '('	((a+b)
7	*	(*	push '*'	((a+b)*
8	(	(* (	push '('	((a+b)* (
9	c	(* (	Append 'c'	((a+b)* (c
10	-	(* (	Append '-'	((a+b)* (c-
11	d	(* (	Append 'd'	((a+b)* (c-d)
12	)	(*	pop '('	((a+b)* (c-d)
13	)	(	pop '*'	((a+b) * (c-d))

It is valid for 'Balanced symbol'

⑥ Balancing Symbol:

$[(a+b)^* c] - d$

SNo	Symbol	stack	Action Taken	Expression so far
1	(	[ ( ]	push '('	(
2	a	[(]	Append 'a'	(a
3	+	[(, +]	push '+'	(a +
4	b	[(, +]	Append 'b'	(a + b
5	)	[ (, + ]	pop 'c'	(a + b)
6	*	[(, +, *]	push '*'	(a + b)^*
7	c	[(, +, *]	Append 'c'	(a + b)^* c
8	)	[ ( ]	pop '('	(a + b)^* c
9	-	[(, -]	pop '-'	(a + b)^* c -
10	d	[(, -]	Append 'd'	(a + b)^* c - d
11	End	∅	pop remaining operators	(a + b)^* c - d

It is valid for 'Balanced symbols'.