

28/7/24

Assignment - 1

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	(	*( *	AB
7	+	*(+	ABC
8	D	*(+	ABC*
9	*	*(+ *	ABC*D
10	E	*(+ *	ABC*DE
11	)	*	ABC*DE
12	+	+	ABC*DE*+
13	F	+	ABC*DE*+*
14	-	-	ABC*DE*+*F

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

② Infix Expression : $A^2 B^3 C + D$

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

Postfix expression = $ABC^{\wedge} * D +$

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.	/	$(A-B) / ((D+E)*F)$	<div style="border: 1px solid black; padding: 2px; display: inline-block;">$(D+E)*F$ $A-B$</div>

2.5. Build Expression $a(b*c)/d-e$

slno	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 Expression = $(a+(b*c)/d-e))$

5) Reduced Syntax:-

$$((a+b) * (c-d))$$

Line	Symbol	Stack	Action Taken	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.	(	(* (	push '('	((a+b)* (
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))

6. $\{ (a+b)^* (c-d) \}$

S.No	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 '('	(a + b)
6.	*	[(, +, *]	push '*'	(a + b)
7.	(	[ (, *, ( ]	Pop '('	(a + b)^*
8.	)	[ ( ]	push '-'	(a + b)^* c
9.	-	[(, -]	push '-'	(a + b)^* (
10.	d	[(, -]	Append 'd'	(a + b)^* (-
11.	end	ϕ	pop remaining operators	(a + b)^* (d (a + b)^* (c - d)