Application of Stack

Algorithm for Infix to prefix conversion:

1. Start
2. Reverse the given infix expression
3. Apply algorithm of infix to postfix conversion
4. Reverse the resultant postfix expression
5. End

Question:

Expression = (A+B^C)*D+E^5

Step 1. Reverse the infix expression.

5^E+D*)C^B+A(

Step 2. Make Every '(' as ')' and every ')' as '('

5^E+D*(C^B+A)

Step 3. Convert expression to postfix form.

5E^DCB^A+*+ (use method to convert infix to postfix expression)

Step 4. Reverse the expression.

Sol. +*+A^BCD^E5

POSTFIX TO INFIX CONVERSION:

abc-+de-fg-h+/*

Expression	Stack

abc-+de-fg-h+/*	NuLL
bc-+de-fg-h+/*	a
c-+de-fg-h+/*	b a
-+de-fg-h+/*	c b a
+de-fg-h+/*	b - c a
de-fg-h+/*	a+(b-c)
e-fg-h+/*	d a+(b-c)
-fg-h+/*	e

	d a+b-c
fg-h+/*	(d – e) a+(b-c)
g-h+/*	f (d – e) a+(b-c)
-h+/*	g f (d – e) a+(b-c)
h+/*	(f-g) (d – e) a+(b-c)

+/*	h f-g d - e a+(b-c)
/*	(f-g)+h (d – e) a+(b-c)
*	(d-e)/((f-g)+h)" a+(b-c)
Null	(a+(b-c)*(d-e)/((f-g)+h)

Ans = a+(b-c)*(d-e)/((f-g)+h)

Prefix to infix conversion:

> *+a-bc/-de+-fgh

Expression	**Stack**
*+a-bc/-de+-fgh	NuLL
*+a-bc/-de+-fg	h
*+a-bc/-de+-f	g h
*+a-bc/-de+-	f g h
*+a-bc/-de+	(f – g) h
*+a-bc/-de	(f-g)+h
*+a-bc/-d	e (f-g)+h

*+a-bc/-	d e (f-g)+h
*+a-bc/	(d – e) (f-g)+h
*+a-bc	(d-e)/((f-g)+h)
*+a-b	c (d-e)/((f-g)+h)
*+a-	b c (d-e)/((f-g)+h)
*+a	(b-c) (d-e)/((f-g)+h)

*+	a b-c (d-e)/((f-g)+h)
*	a+(b-c) (d-e)/((f-g)+h)
End	(a+(b-c))*(d-e)/((f-g)+h)

Ans = (a+(b-c))*(d-e)/(f-g+h)