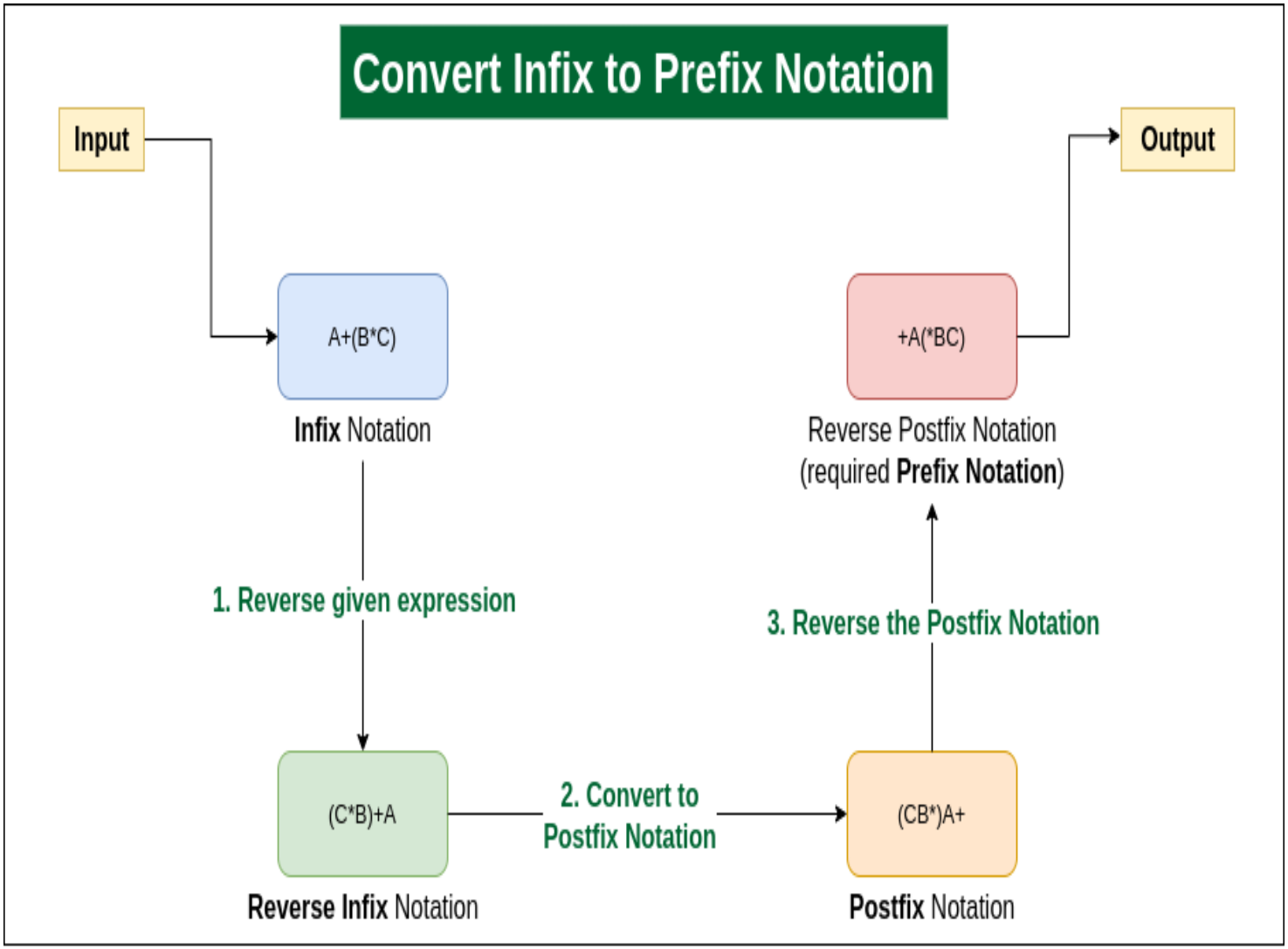
Infix to Prefix Conversion using Stack

Prof. Shweta Dhawan Chachra


Convert Infix to Prefix Notation
Input
A+(B*C)
Infix Notation
1. Reverse given expression
(C*B)+A
Reverse Infix Notation
2. Convert to Postfix Notation
(CB*)A+
Postfix Notation
3. Reverse the Postfix Notation
+A(*BC)
Reverse Postfix Notation (required Prefix Notation)
Output

Infix to Prefix Conversion using Stack

- ***Step 1: Reverse the infix expression***. *Note while reversing each '(' will become ')' and each ')' becomes '('.*
- ***Step 2:*** *Convert the reversed* ***infix expression to "nearly" postfix expression***.
  - *While converting to postfix expression, instead of using pop operation to pop operators with greater than or equal precedence,* ***here we will only pop the operators from stack that have greater precedence.***
- ***Step 3: Reverse the postfix expression.***

Infix to Prefix Conversion using stack

Eg- **P*Q^R+S**

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Eg- **P*Q^R+S**
Reversing Infix=S+R^Q*P

Scan	Stack	Expression Q
S		S
+	+	S
R	+	SR
^	+^	SR
Q	+^	SRQ
*	+*	SRQ^
P	+*	SRQ^P
End of Expression	Pop all elements	SRQ^P*+

Postfix Expression=SRQ^P*+
Reverse of Postfix=Prefix Notation=+*P^QRS

Manual Conversion -Infix to Prefix

Convert the following expressions from Infix to Prefix;

1) **(P*Q^R+S)=+*P^QRS**
2) **(A-B/C)*(D*E-F)=*-A/BC-*DEF**
3) **(A*B+(C/D))-F=-+*AB/CDF**
4) **A+B*C-(D/E^F)*G*H**

=A+*BC-(/D^EF)*G*H
=A+*BC-*/D^EFG*H
=A+*BC-/D^EFGH**
=+A*BC-/D^EFGH**
=-+A*BC/D ^EFGH**

5) **(A+B)*C/D+E^F/G**

=+AB*C/D+E^F/G
=+AB*C/D+^EF/G
=*+ABC/D+^EF/G
=/*+ABCD+^EF/G
=/*+ABCD+/^EFG
=+/*+ABCD/^EFG

Infix to Prefix Conversion using stack

Eg- **(A-B/C)*(D*E-F)**

Infix to Prefix Conversion using stack

Eg- **(A-B/C)*(D*E-F)**

Reversing Infix=(F-E*D)*(C/B-A)

Scan	Stack	Expression Q
(	(	
F	(	F
-	(-	F
E	(-	FE
*	(-*	FE
D	(-*	FED
)	NULL	FED*-
*	*	FED*-
(	*(	FED*-
C	*(	FED*-C

Scan	Stack	Expression Q
/	*(/	FED*-C
B	*(/	FED*-CB
-	*(-	FED*-CB/
A	*(-	FED*-CB/A
)	*	FED*-CB/A-
End of Expression	Pop all elements	FED*-CB/A-*

Postfix Expression=FED*-CB/A-*

Reverse of Postfix=Prefix Notation=*-A/BC-*DEF

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=A+*BC-(/D^EF)*G*H
=A+*BC-*/D^EFG*H
=A+*BC-/D^EFGH**
=+A*BC-/D^EFGH**
=-+A*BC/D ^EFGH**

5) **(A+B)*C/D+E^F/G**

=+AB*C/D+E^F/G
=+AB*C/D+^EF/G
=*+ABC/D+^EF/G
=/*+ABCD+^EF/G
=/*+ABCD+/^EFG
=+/*+ABCD/^EFG

Infix to Prefix Conversion using stack

Eg- **(A*B+(C/D))-F**

Infix to Prefix Conversion using stack

Eg- (A*B+(C/D))-F
Reversing Infix=F-((D/C)+B*A)

Scan	Stack	Expression Q
F		F
-	-	F
(	-(	F
(	-((	F
D	-((	FD
/	-((/	FD
C	-((/	FDC
)	-(	FDC/
+	-(+	FDC/
B	-(+	FDC/B

Scan	Stack	Expression Q
*	-(+*	FDC/B
A	-(+*	FDC/BA
)	-	FDC/BA*+
End of Expression	Pop all elements	FDC/BA*+-

Postfix Expression= FDC/BA*+-
Reverse of Postfix=Prefix Notation=-+*AB/CDF

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=A+*BC-(/D^EF)*G*H
=A+*BC-*/D^EFG*H
=A+*BC-/D^EFGH**
=+A*BC-/D^EFGH**
=-+A*BC/D ^EFGH**

5) **(A+B)*C/D+E^F/G**

=+AB*C/D+E^F/G
=+AB*C/D+^EF/G
=*+ABC/D+^EF/G
=/*+ABCD+^EF/G
=/*+ABCD+/^EFG
=+/*+ABCD/^EFG