

Introduction to Expressions

Unit 3

CC4 Data Structures and Algorithms

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Infix to Prefix Conversion



Infix-Prefix Example

Infix: <Operand 1> <**Operator**> <Operand 2>

Prefix: <**Operator**> <Operand 1> <Operand 2>

$8 / 4 * 2 - 5 + 6 + (7 - 6 + 5 ^ 2 \% (9 - 6 + 1))$

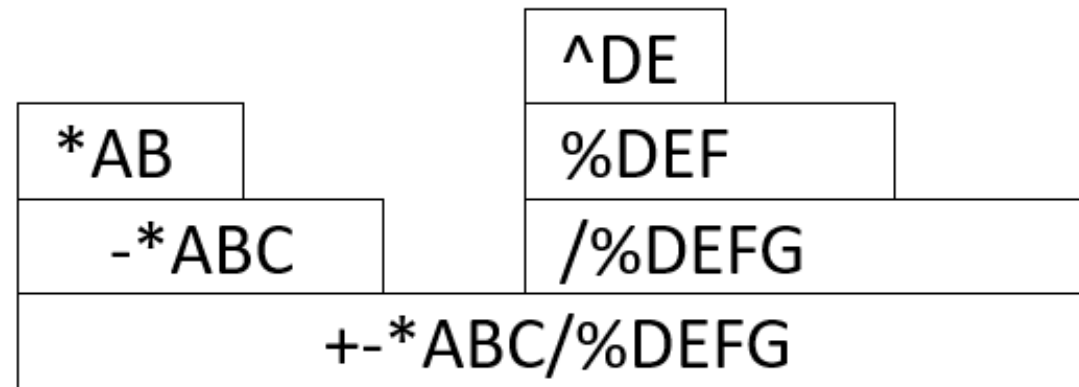
/84	-76	^52	-96
*/842			+ -961
-*/8425		% ^52+ -961	
+*/84256		+ -76% ^52+ -961	
+*/84256+ -76% ^52+ -961			

Infix-Prefix Example

Infix: <Operand 1> <**Operator**> <Operand 2>

Prefix: <**Operator**> <Operand 1> <Operand 2>

$A * B - C + (D ^ E) \% F / G$





Infix to Postfix Conversion



Infix-Postfix Example

Infix: <Operand 1> <**Operator**> <Operand 2>

Postfix: <Operand 1> <Operand 2> <**Operator**>

$8 / 4 * 2 - 5 + 6 + (7 - 6 + 5 ^ 2 \% (9 - 6 + 1))$

84/	76-	52^	96-
84/2*			96-1+
84/2*5-		52^96-1+%	
84/2*5-6+	76-52^96-1+%+		
84/2*5-6+76-52^96-1+%++			

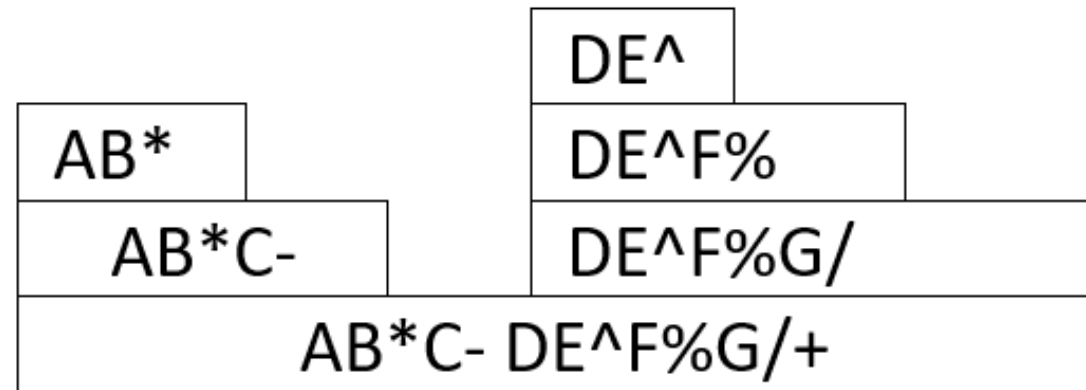


Infix-Postfix Example

Infix: <Operand 1> <**Operator**> <Operand 2>

Postfix: <Operand 1> <Operand 2> <**Operator**>

$A * B - C + (D ^ E) \% F / G$





Infix to Postfix Using Stacks

Precedence Rule | Conversion



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Precedence Rule

IN-Stack Priority

- The priority if the operator as an element of the stack

IN-Coming Priority

- The priority of the operator as current token

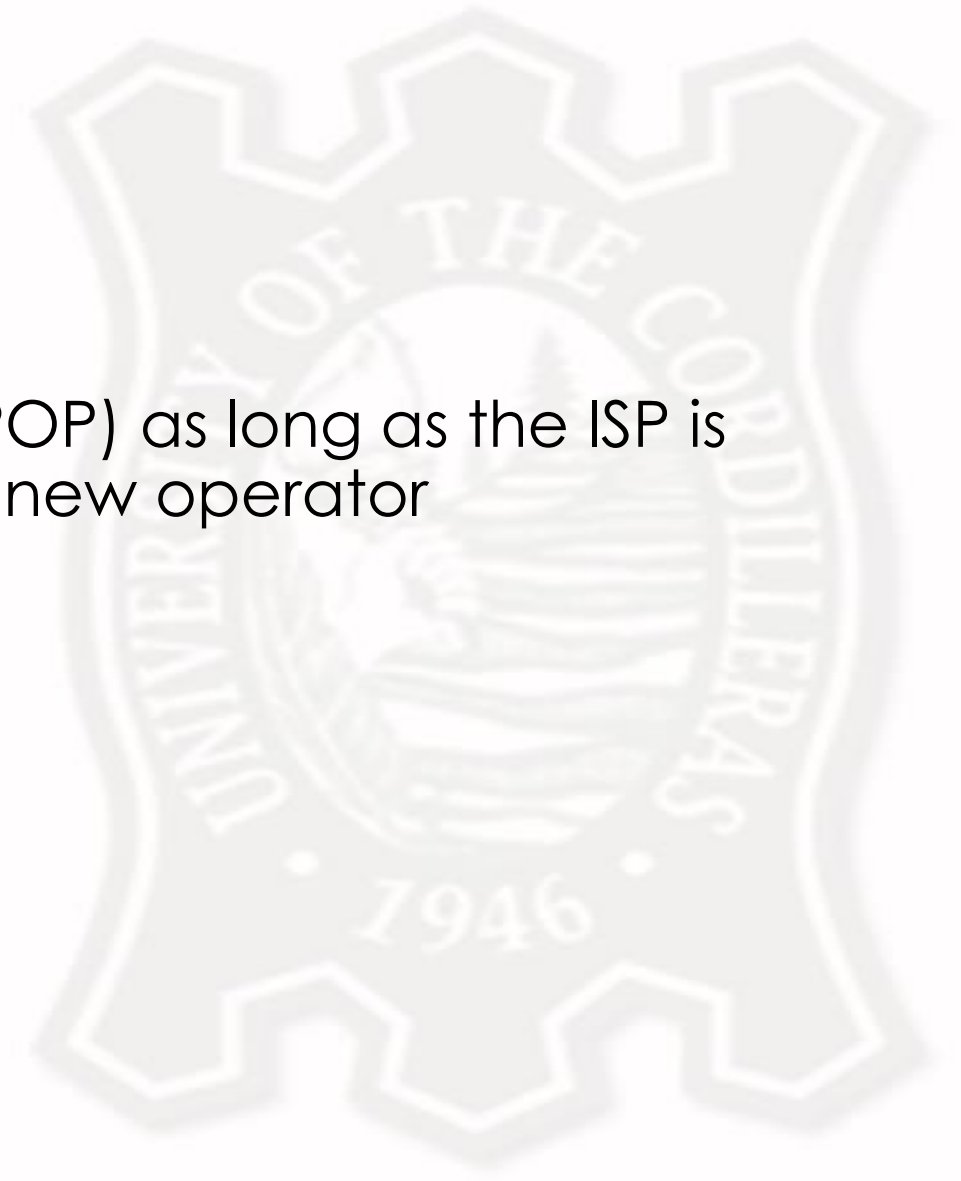
SYMBOL	ISP	ICP
)	--	--
^	3	4
*, /, %	2	2
+, -	1	1
(0	4



Precedence Rule

Rule:

- Operators are taken out of the stack (POP) as long as the ISP is greater than or equal to the ICP of the new operator



Conversion

Example: $8/4*2-5+6+(7-6+5^2\%(9-6+1))$

Token	Stack	Output
8	#	8
/	#/	8
4	#/	84
*	#*	84/
2	#*	84/2
-	#-	84/2*
5	#-	84/2*5



Conversion

+	#+	$84/2*5-$
6	#+	$84/2*5-6$
+	#+	$84/2*5-6+$
(#+($84/2*5-6+$
7	#+($84/2*5-6+7$
-	#+(-	$84/2*5-6+7$
6	#+(-	$84/2*5-6+76$
+	#+(+	$84/2*5-6+76-$



Conversion

5	#+(+	$84/2*5-6+76-5$
^	#+(+^	$84/2*5-6+76-5$
2	#+(+^	$84/2*5-6+76-52$
%	#+(+%	$84/2*5-6+76-52^$
(#+(+% ($84/2*5-6+76-52^$
9	#+(+% ($84/2*5-6+76-52^{9}$
-	#+(+% (-	$84/2*5-6+76-52^{9}$
6	#+(+% (-	$84/2*5-6+76-52^{96}$



Conversion

+	#+(+%(+	84/2*5-6+76-52^96-
1	#+(+%(+	84/2*5-6+76-52^96-1
)	#+(+%	84/2*5-6+76-52^96-1+

