Prefix Notation

In this notation, named after the Polish mathematician Jan Lukasiewicz, the operator symbol is placed before its two operands .

<u>For example ,</u>

→ To add A to B we can write as: $+AB$ ***or*** $+BA$

→ To substract D from C we have to write as $-CD$.

In order to translate an arithmetic expression in infix notation to polish notation, we do step by step using brackets ([]) ***to indicate the partial translation.***

Consider the following expression in infix notation:

$(A-B/C)*(A*K-L)$

partial translations may look like:

$=(A-[/BC])*([*AK]-L)$

$=[-A/BC]*[-*AKL]$

$=*-A/BC-*AKL$

***Eg* 1: $A + (B * C - (D/E + F) * G) * H$**

***Partial translations of the above*:**

1*st we will do the work of Parenthesis*.

***Next we will follow the precedence table*:**

List of Operators In Expression

Symbol Used	***Operation Performed***	***Precedence***
^(*Caret*)	*Exponent (Power)*	*Highest*
* (*asterisk*)	*Multiplication*	*Highest*
/(*Slash*)	*Division*	*Highest*
%(*percentage*)	*Modulus(Remainder)*	*Highest*
+(*Plus*)	*Addition*	*Lowest*
−(*hyphen*)	*Subtraction*	*Lowest*

Highest precedence will be executed first and lowest at last.

$= A + (B * C - ([/DE] + F) * G) * H$

[*/DE is prefix string + F is still an infix string.*]

$= A + (B * C - ([+/DEF]) * G) * H$

$= A + (B * C - +/DEF * G) * H$

[*+/DEF is prefix string * G is still an infix string.*]

$= A + (B * C - [* +/DEFG]) * H$

$= A + ([* B C] - [* +/DEFG]) * H$

$= A + ([- * B C * +/DEFG]) * H$

$= A + - * B C * +/DEFG * H$

$= A + [* - * B C * +/DEFGH]$

$= [+A * - * \ BC \ * +/DEFGH]$

$= +A * - * \ BC \ * +/DEFGH$

Eg 2: $A\hat{}B + C * D\%E - F/G$

Partial translations of the above:

$= [\hat{}AB] + C * D\%E - F/G$

$= \hat{}AB + C * D\%E - [/FG]$

$= \hat{}AB + [* CD]\%E - /FG$

$= \hat{}AB + * C[\%DE] - /FG$

$= \hat{}AB + * C\%DE - /FG$

$= [+\hat{}AB * C]\%DE - /FG$

$= +\hat{}AB * C\%DE - /FG$[**1st part**:$* C\%DE$ **and 2nd part**:$/FG$ ***and operator*** $= \ -$]

$= +\hat{}AB[- * C\%DE/FG]$

$= +\hat{}AB - * C\%DE/FG$