# ­­­**Examples**

|  |  |  |  |
| --- | --- | --- | --- |
| **Infix** | **Postfix (Reverse Polish Notation)** | **Prefix (Polish Notation)** | **Notes** |
| A \* B + C / D | A B \* C D / + | + \* A B / C D | multiply A and B, divide C by D, add the results |
| A \* (B + C) / D | A B C + \* D / | / \* A + B C D | add B and C, multiply by A, divide by D |
| A \* (B + C / D) | A B C D / + \* | \* A + B / C D | divide C by D, add B, multiply by A |

# **Formulation of Infix to Prefix and Postfix**

|  |  |  |
| --- | --- | --- |
| **Priority** | **Operator** | **Associativity** |
| **1** | **(){}[]** | **R=>L** |
| **2** | **^** | **R=>L** |
| **3** | **\*/** | **L=>R** |
| **4** | **+-** | **L=>R** |
| **a+b\*c/d-e (Infix)**  **=>a+\*bc/d-e**  **=>a+/\*bcd-e**  **=>+a/\*bcd-e**  **=>-+a/\*bcde (Prefix)** | | |
| **a+b\*c/d-e (Infix)**  **=>a+bc\*/d-e**  **=>a+bc\*d/-e**  **=>abc\*d/+-e**  **=>abc\*d/+e- (Postfix)** | | |

# **Process Of Implementing In Code (Formulation)**

|  |  |  |
| --- | --- | --- |
| **Infix =a+b\*c/d-e** | | |
| **Input** | **Stack** | **Postfix Expression** |
| **a** | **empty** | **a** |
| **+** | **+** | **a** |
| **b** | **+** | **ab** |
| **\*** | **+\*** | **ab** |
| **c** | **+\*** | **abc** |
| **/** | **+/** | **abc\*** |
| **d** | **+/** | **abc\*d** |
| **-** | **-** | **abc\*d/+** |
| **e** | **-** | **abc\*d/+e** |
| **empty** | **empty** | **abc\*d/+e-** |

|  |  |  |
| --- | --- | --- |
| **Infix =p\*q\*r+(s^t)^u-v/w** | | |
| **Input** | **Stack** | **Postfix Expression** |
| **p** | **empty** | **p** |
| **\*** | **\*** | **p** |
| **q** | **\*** | **pq** |
| **\*** | **\*** | **Pq\*** |
| **r** | **\*** | **Pq\*r** |
| **+** | **+** | **pq\*r\*** |
| **(** | **+(** | **pq\*r\*** |
| **s** | **+(** | **Pq\*r\*s** |
| **^** | **+(^** | **Pq\*r\*s** |
| **t** | **+(^** | **Pq\*r\*st** |
| **)** | **+** | **Pq\*r\*st^** |
| **^** | **+^** | **Pq\*r\*st^** |
| **u** | **+^** | **Pq\*r\*st^u** |
| **-** | **-** | **Pq\*r\*st^u^+** |
| **v** | **-** | **Pq\*r\*st^u^+v** |
| **/** | **-/** | **Pq\*r\*st^u^+v** |
| **w** | **-/** | **Pq\*r\*st^u^+vw** |
| **empty** | **empty** | **Pq\*r\*st^u^+vw/-** |