

Balanced/Unbalanced Expressions:

Ex1 : Consider the expressions below and determine whether they are balanced

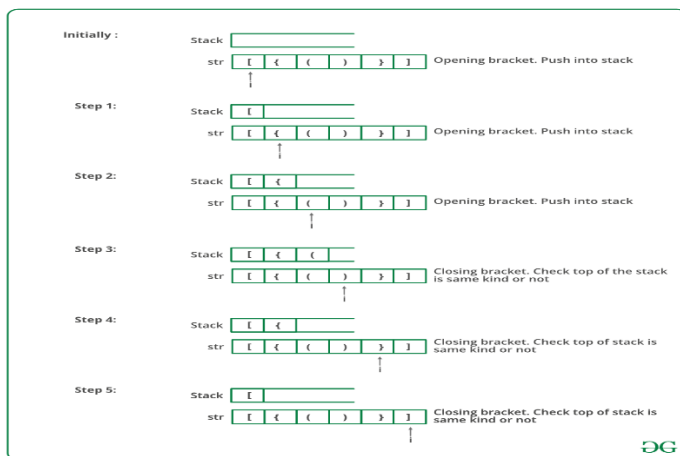
exp1 = “[()]”

ans: Not Balanced

exp2 = “[()]{}{[()()]0}”

ans: Balanced

Ex2: Consider the expression “[{}()]” perform necessary push and pop operations to determine whether the expression is balanced and draw state of the stack step by step.



Ex3:

Here is an INCORRECT pseudo code for the algorithm which is supposed to determine whether a sequence of parentheses is balanced:

```
declare a char stack
while (more input is available) {
    read a char
    if (the char is a '(')
        push it on the stack
    else if (the char is a ')')
        and the stack is not empty)
        pop a char off the stack
    else
        print "unbalanced" and exit
}
print "balanced"
```

Which of these unbalanced sequences does the above code think is balanced?

a) (()())

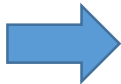
b) (())()

c) ()()

d) ((())

Infix → postfix & prefix

Ex4: Find corresponding prefix and postfix notations for the given infix notations below.

Infix Notation		Prefix Notation	Postfix Notation
$a + b$		$+ a b$	$a b +$
$(a + b) * c$		$* + a b c$	$a b + c *$
$a * (b + c)$		$* a + b c$	$a b c + *$
$a / b + c / d$		$+ / a b / c d$	$a b / c d / +$
$(a + b) * (c + d)$		$* + a b + c d$	$a b + c d + *$
$((a + b) * c) - d$		$- * + a b c d$	$a b + c * d -$

Postfix → Infix

Ex 5: Convert the Postfix expression “ABC/-AK/L-*” into prefix expression. Show the process step by step.

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

Prefix → Infix

Ex6: Convert the prefix expression “*-A/BC-/AKL” into infix expression and show the process step by step.

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

References :

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https://www.tutorialspoint.com/data_structures_algorithms/expression_parsing.htm

<https://algorithms.tutorialhorizon.com/convert-postfix-to-infix-expression/>