**S.Y. B. Tech. Academic Year 2018-19 Trimester: IV**

**Data Structure-I**

**LABORATORY WRITE UP**

###### Experiment Number: 04

### **TITLE: Stack Operations**

**PROBLEM STATEMENT**:

Implement stack as an ADT and apply it for different expression conversion (infix to postfix, infix to prefix (Any one), prefix to infix, prefix to postfix, postfix to infix, and postfix to prefix (any one).

**OBJECTIVE:**

1. To study Stack and its operations
2. To study the importance of expression conversions

**THEORY: *//To be Written by Students***

***// Write theory by elaborating below points***

Write in brief about stack and different Expression conversion

**IMPLEMENTATION:**

* **PLATFORM:** 
  + 64-bit Open source Linux or its derivatives.
  + Open Source C Programming tool like gcc/Eclipse Editor.
* I**INPUT & OUTPUT:**

|  |  |  |
| --- | --- | --- |
| **TEST CASE NO** | **INPUT** | **OUTPUT** |
| TC001 | (a+b)\*c/d | Infix to postfix : ab+c\*d/  Infix to prefix: /\*+abcd |
| TC002 | abcdg/\*++ | Postfix to Infix:(a+(b+(c\*(d/g)))  Postfix to Prefix: +a+b\*c/dg |
| TC003 | a^b^c | Infix to postfix : abc^^  Infix to prefix: ^a^bc |

* **TEST CONDITIONS:-**

1. Input infix expression and check the postfix or prefix output.
2. Input postfix or prefix expression and checks its infix , prefix or postfix.

* **PSEUDO CODE: *//To be Written by Students***

Write pseudo code for push, pop, infix to postfix or infix to prefix(any one), prefix to infix , prefix to postfix, postfix to infix , postfix to prefix(any one which you implemented) operation.

* **TIME COMPLEXITY: *//To be Written by Students***

Write time complexity of above operations

* **CONCLUSION:**

Thus, implemented Stack Operations assignment using Array concepts. This System is able to apply different expression conversion.

* **FAQs *//To be Written by Students***
* What is advantage of prefix and postfix over infix expression?
* Explain how postfix/prefix expression is evaluated.
* What is ISP and ICP?
* Give various applications of stack
* Why stack is used in expression conversion?
* Give stack full and stack empty conditions for stack.
* **PRACTICE ASSIGNMENTS**

###### Write a program for evaluation of postfix expression.

1. Write a program to check whether string is palindrome or not using stack.
2. Write a program to convert decimal to binary using stack.