231501058 CS23231 – D a t a S t r u c t u r e s

**Ex. No.: 5**

**Infix to Postfix Conversion**

**Date:5/4/24**

**Write a C prog ram to pe rform in fix to postfix conversion using stack .**

**Algorithm:**

#include <stdio.h>

#include <stdlib.h>

#include <ctype.h>

struct node {

char data;

struct node\* next;

};

struct node\* top = NULL;

void push(char ele) {

struct node\* newnode = (struct node\*)malloc(sizeof(struct node)); if (newnode != NULL) {

newnode->data = ele;

newnode->next = top;

top = newnode;

}

}

char pop() {

if (top == NULL) {

printf("\nStack Underflow\n");

return -1;

} else {

char popped = top->data;

struct node\* temp = top;

top = top->next;

free(temp);

return popped;

}

}

char peek() {

if (top != NULL) {

return top->data;

} else {

return -1;

}

}

int isEmpty() {

return top == NULL;

}



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int precedence(char op) {

switch (op) {

case '+':

case '-': return 1;

case '\*':

case '/': return 2;

case '^': return 3;

default: return 0;

}

}

int isOperator(char ch) {

return ch == '+' || ch == '-' || ch == '\*' || ch == '/' || ch == '^';

}

void infixToPostfix(char\* infix, char\* postfix) { int i = 0, j = 0;

while (infix[i] != '\0') {

if (isdigit(infix[i]) || isalpha(infix[i])) { postfix[j++] = infix[i];

} else if (infix[i] == '(') { push(infix[i]);

} else if (infix[i] == ')') {

while (!isEmpty() && peek() != '(') {

postfix[j++] = pop();

}

pop(); // Remove '(' from stack

} else if (isOperator(infix[i])) {

while (!isEmpty() && precedence(peek()) >= precedence(infix[i])) { postfix[j++] = pop();

}

push(infix[i]);

}

i++;

}

while (!isEmpty()) {

postfix[j++] = pop();

}

postfix[j] = '\0';

}

int main() {

char infix[100] = "a+b\*(c^d-e)^(f+g\*h)-i";

char postfix[100];

printf("Infix expression: %s\n", infix);

infixToPostfix(infix, postfix);

printf("Postfix expression: %s\n", postfix);

return 0;

}

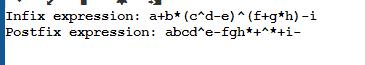


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**OUTPUT**



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