

U24AI023

Sardar Vallabhbhai National Institute of Technology, Surat
Department of Artificial Intelligence
Data Structure (AI102)
B.Tech I - II Semester
Assignment-6

Note: Input should be taken from the user

Question 1: Write a C/C++ program to convert an infix expression to a postfix expression using a stack, handling the operators +, -, *, /, and parentheses.

Example:

Input: A*(B+C*D)+E

Output: ABCD*+*E+

```

#include <iostream>
#include <stack>
using namespace std;

int precedence(char op) {
    if (op == '+' || op == '-') return 1;
    if (op == '*' || op == '/') return 2;
    return 0;
}

string infixToPostfix(string infix) {
    stack<char> s;
    string postfix = "";

    for (char c : infix) {
        if (isdigit(c)) {
            postfix += c;
        }

        else if (c == '(') {
            s.push(c);
        }

        else if (c == ')') {
            while (!s.empty() && s.top() != '(') {
                postfix += s.top();
                s.pop();
            }
            s.pop();
        }

        else {
            while (!s.empty() && precedence(s.top()) >= precedence(c)) {
                postfix += s.top();
                s.pop();
            }
            s.push(c);
        }
    }

    while (!s.empty()) {
        postfix += s.top();
        s.pop();
    }

    return postfix;
}

int main() {
    string infix;
    cout << "Enter infix expression: ";
    cin >> infix;

    string postfix = infixToPostfix(infix);
    cout << "Postfix expression: " << postfix << endl;

    return 0;
}

```