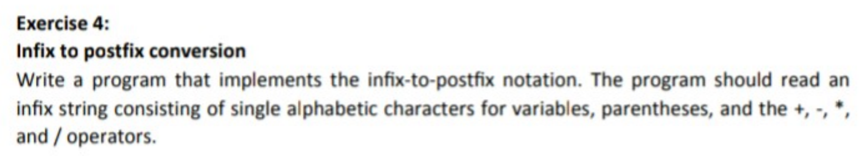
Question: Exercise 4: Infix to postfix conversion Write a program that im...



Exercise 4:

Infix to postfix conversion

Write a program that implements the infix-to-postfix notation. The program should read an infix string consisting of single alphabetic characters for variables, parentheses, and the +, -, *, and / operators.

write the program in c++ language

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Expert Answer

Anonymous answered this
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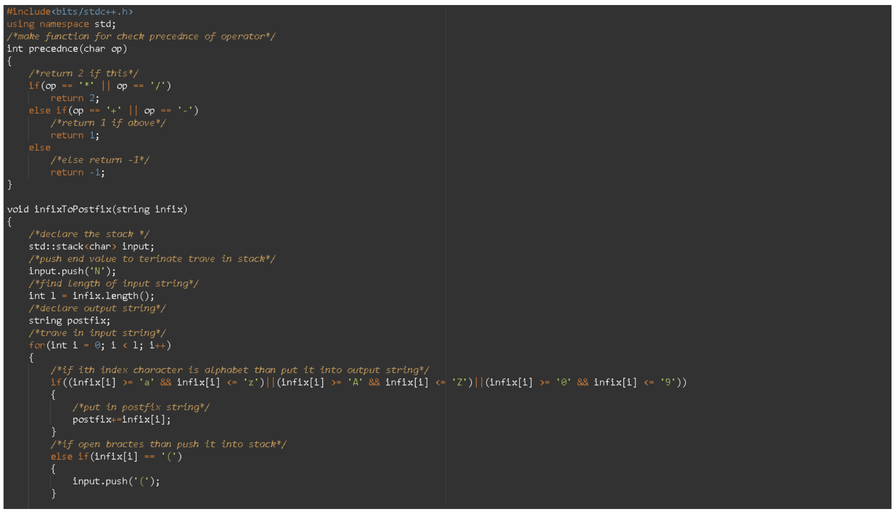
input code:



```
#include<bits/stdc++.h>
using namespace std;
/*make function for check precednce of operator*/
int precednce(char op)
{
    /*return 2 if this*/
    if(op == '*' || op == '/')
        return 2;
    else if(op == '+' || op == '-')
        /*return 1 if above*/
        return 1;
    else
        /*else return -1*/
        return -1;
}

void infixToPostfix(string infix)
{
    /*declare the stack */
    std::stack<char> input;
    /*push end value to terinate trave in stack*/
    input.push('N');
    /*find length of input string*/
    int l = infix.length();
    /*declare output string*/
    string postfix;
    /*trave in input string*/
    for(int i = 0; i < l; i++)
    {
        /*if ith index character is alphabet than put it into output string*/
        if((infix[i] >= 'a' && infix[i] <= 'z')||(infix[i] >= 'A' && infix[i] <= 'Z')||(infix[i] >= '0' && infix[i] <= '9'))
        {
            /*put in postfix string*/
            postfix+=infix[i];
        }
        /*if open bractes than push it into stack*/
        else if(infix[i] == '(')
        {
            input.push('(');
        }
```

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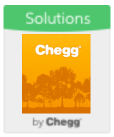

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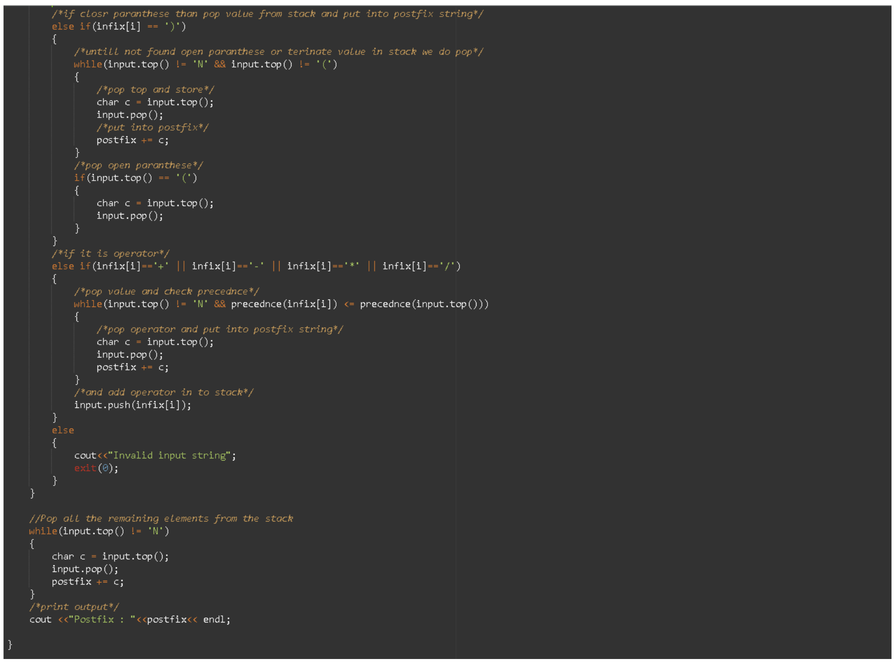
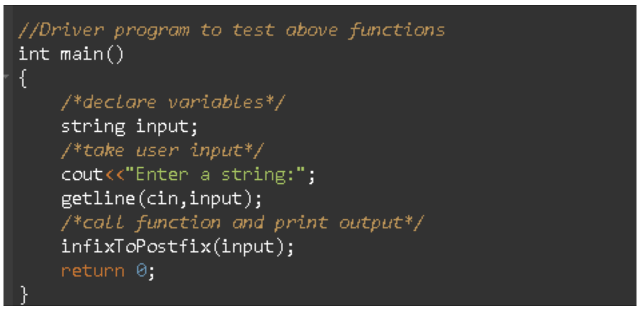
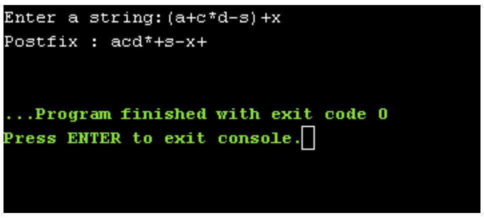


```
        /*if closr paranthese than pop value from stack and put into postfix string*/
        else if(infix[i] == ')')
        {
            /*untill not found open paranthese or terinate value in stack we do pop*/
            while(input.top() != 'N' && input.top() != '(')
            {
                /*pop top and store*/
                char c = input.top();
                input.pop();
                /*put into postfix*/
                postfix += c;
            }
            /*pop open paranthese*/
            if(input.top() == '(')
            {
                char c = input.top();
                input.pop();
            }
        }
        /*if it is operator*/
        else if(infix[i]=='+' || infix[i]=='-' || infix[i]=='*' || infix[i]=='/')
        {
            /*pop value and check precednce*/
            while(input.top() != 'N' && precednce(infix[i]) <= precednce(input.top()))
            {
                /*pop operator and put into postfix string*/
                char c = input.top();
                input.pop();
                postfix += c;
            }
            /*and add operator in to stack*/
            input.push(infix[i]);
        }
        else
        {
            cout<<"Invalid input string";
            exit(0);
        }
    }

    //Pop all the remaining elements from the stack
    while(input.top() != 'N')
    {
        char c = input.top();
        input.pop();
        postfix += c;
    }
    /*print output*/
    cout <<"Postfix : "<<postfix<< endl;

}
```



```
//Driver program to test above functions
int main()
{
    /*declare variables*/
    string input;
    /*take user input*/
    cout<<"Enter a string:";
    getline(cin,input);
    /*call function and print output*/
    infixToPostfix(input);
    return 0;
}
```

output:



```
Enter a string:(a+c*d-s)+x
Postfix : acd*+s-x+


...Program finished with exit code 0
Press ENTER to exit console.
```

code:

```
#include<bits/stdc++.h>
using namespace std;
/*make function for check precednce of operator*/
int precednce(char op)
{
/*return 2 if this*/
if(op == '*' || op == '/')
return 2;
else if(op == '+' || op == '-')
/*return 1 if above*/
return 1;
else
/*else return -1*/
return -1;
}

void infixToPostfix(string infix)
{
/*declare the stack */
std::stack<char> input;
/*push end value to terinate trave in stack*/
input.push('N');
/*find length of input string*/
int l = infix.length();
/*declare output string*/
```

```
string postfix;
/*trave in input string*/
for(int i = 0; i < l; i++)
{
/*if ith index character is alphabet than put it into output string*/
if((infix[i] >= 'a' && infix[i] <= 'z')||(infix[i] >= 'A' && infix[i] <= 'Z')||(infix[i] >= '0' && infix[i] <= '9'))
{
/*put in postfix string*/
postfix+=infix[i];
}
/*if open bractes than push it into stack*/
else if(infix[i] == '(')
{
input.push('(');
}


/*if closr paranthese than pop value from stack and put into postfix string*/
else if(infix[i] == ')')
{
/*untill not found open paranthese or terinate value in stack we do pop*/
while(input.top() != 'N' && input.top() != '(')
{
/*pop top and store*/
char c = input.top();
input.pop();
/*put into postfix*/
postfix += c;
}
/*pop open paranthese*/
if(input.top() == '(')
{
char c = input.top();
input.pop();
}
}
/*if it is operator*/
else if(infix[i]=='+' || infix[i]=='-' || infix[i]=='*' || infix[i]=='/')
{
/*pop value and check precednce*/
while(input.top() != 'N' && precednce(infix[i]) <= precednce(input.top()))
{
/*pop operator and put into postfix string*/
char c = input.top();
input.pop();
postfix += c;
}
/*and add operator in to stack*/
input.push(infix[i]);
}
else
{
cout<<"Invalid input string";
exit(0);
}
}

//Pop all the remaining elements from the stack
while(input.top() != 'N')
{
char c = input.top();
input.pop();
postfix += c;
}
/*print output*/
cout <<"Postfix : "<<postfix<< endl;

}

//Driver program to test above functions
int main()
{
/*declare variables*/
string input;
/*take user input*/
cout<<"Enter a string:";
getline(cin,input);
/*call function and print output*/
infixToPostfix(input);
return 0;
```

}

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