**Assignment- D10**

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**Problem Statement:**

# In any language program mostly syntax error occurs due to unbalancing delimiter such as (),{},[]. Write C++ program using stack to check whether given expression is well parenthesized or not.

**Program:**

#include<iostream>

#include<string.h>

using namespace std;

#define MAX 50

struct stknode

{

char stack[MAX];

int top = -1;

}st;

class StClass

{

public:

void push(char);

char pop();

int check(char exp[MAX]);

friend int match(char a, char b);

};

int match(char a, char b)

{

if (a == '[' && b == ']')

return 1;

if (a == '{' && b == '}')

return 1;

if (a == '(' && b == ')')

return 1;

return 0;

}

int StClass::check(char exp[])

{

int i;

char temp;

int n = strlen(exp);

for (i = 0; i<n; i++)

{

if (exp[i] == '(' || exp[i] == '{' || exp[i] == '[')

push(exp[i]);

if (exp[i] == ')' || exp[i] == '}' || exp[i] == ']')

if (st.top == -1) //stack empty

return 0;

else

{

temp = pop();

if (!match(temp, exp[i]))

return 0;//not

}

}

if (st.top == -1) //stack empty

return 1;//well parenthsized

else

return 0;

}

void StClass::push(char item)

{

if (st.top == (MAX - 1))

{

cout << "Stack Overflow\n";

return;

}

st.top = st.top + 1;

st.stack[st.top] = item;

}

char StClass::pop()

{

if (st.top == -1)

{

cout << "Stack Underflow\n";

exit(1);

}

return(st.stack[st.top--]);

}

int main()

{

char exp[MAX];

int status;

StClass obj;

cout << "Enter a parenthesized expression : ";

cin >> exp;

status = obj.check(exp);

if (status == 1)

cout << "The expression is well parenthesized!!!\n";

else

cout << "The expression is not well parenthesized!!!";

return 0;

}

**Output:**

