# Title: -

**Experiment No-10**

C++ program to check whether given expression is well parenthesis or not.

# Objectives: -

Understand the use of stack operation such as Push and Pop.

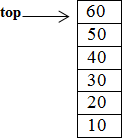
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# Problem Statement: -

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.

# Theory-

**Basic Concept of Stack:-**

A stack is an ordered list in which all the insertion and deletion are made at one end called as top. If we have to make stack elements of 10, 20, 30, 40, 50, 60 then 10 will be the bottommost element and 60 will be the topmost element in the stack. As stack is shown in figure

# Representation of stack in C++:-

struct stack

{ int data[10]; int top;

}s;

# Stack Operations:-

Basically there are two important stack operation 1) push and 2) pop

Performing Push Operation means we are inserting elements onto the stack . and Pop Operation means we are removing the element from the stack.

Before pushing we need to check stack full condition and before performing pop operation we need to check stack empty condition.

# The push and Pop Operation:-

1. **push Operation**

void push(int Item)

{ st.top++; / \* top pointer is set to next location\*/

st.s[st.top] =item;/\* placing the element at that location \*/

}

# pop operation

int pop( )

{

int item;

item = st.s[st.topl; st.top--; return(item);

}

In the choice of pop- it invokes the function isempty to determine whether the stack is

empty or not. If it is empty, then the function generates an error as stack underflow. If not, then pop function returns the element which is at the top of the stack.

# Algorithm:-

1. Start
2. Declare the variables such as top , stk, exp, ch, i
3. exp=Input Enter the expression to check whether it is in well form or not
4. If ch==’(’ then call function push(ch)
5. If ch==’[’ then call function push(ch)
6. If ch==’{’ then call function push(ch)

7)If ch==’)’ then call function pop(ch) and check if poped character is’(‘ if not print” Expression doesn’t have well formed parenthesis” and goto step 11

8)If ch==’]’ then call function push(ch) and check if poped character is’(‘ if not print” Expression doesn’t have well formed parenthesis” and goto step 11

9)If ch==’}’ then call function push(ch) and check if poped character is’(‘ if not then print” Expression doesn’t have well formed parenthesis” and goto step 11

10)if all characters from expression are considered and stack is empty then print” Expression t has well formed parenthesis”

11)Stop

**Conclusion:**

By this way, we can learn how to use the syntax error occurs due to unbalancing delimiter and use of Push and pop operation to check whether given expression is well parenthesized or not.