

Assignment - 09 (DSL)

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Roll No. 21123

Batch - F1

Dir. SET

DOP:

DOS:

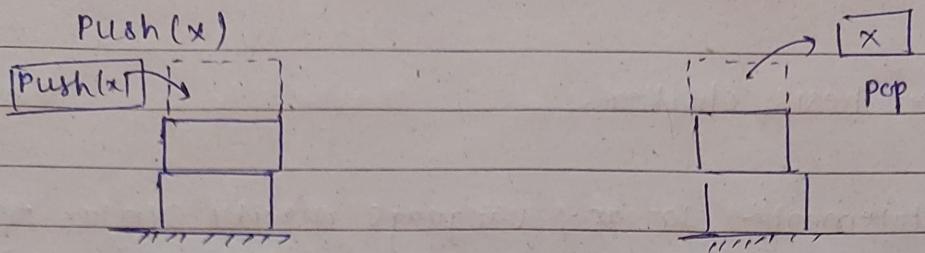
Title: Parenthesis checker.

- # Problem Statement - In any language mostly syntax error occurs due to unbalancing delimiters such as (), {}, [] write C++ program using stack to check whether given expression is well parenthesized or not.
- # Objectives To - ① Implement Stack data structure using array or linked list. ② Implement parenthesis checker using stack.
- # Outcomes: Student will be able to write and execute C++ program to create a parenthesis checker using concept of stack.
- # S/W and H/W requirement -
Window 10, mingw compiler, Vs code IDE, Intel i5-9300H, 4 core logical processors 18GB RAM, 512 GB SSD, NVIDIA GeForce GTX 1050 GDDR5.
- # theory: Stack is a data structure that follows FILO rule. the element that comes first goes out last stack can be implemented using either array or linked list. with array, no. of elements are limited due to static memory allocation.

with linked list providing dynamic memory allocation there is no limit.

stack flow FILO method i.e first in last out.

Stack has 2 main operations : push(x) & pop()



Algorithm.

- 1) Start.
- 2) Create a class stack having data members top and define array with size.
 - 2.1 create a function isFull()


```
if (top == maxSize - 1) { stack is full };
else { return 0 };
```
 - 2.2 create a function isEmpty()


```
if (top == -1) { stack underflow };
else return 0;
```
 - 2.3 create pop() push { increment top & give new value for top}.
 - 2.4 create pop() { remove the top most element}.
- 3) Set for loop till length of expression()


```
if (exp[i] == '(' || '[' || '{') { push into stack }
else if (exp[i] == ')' && data[top] == ')')
    { pop from stack }
else if (exp[i] == '}' && data[top] == '}')
    { pop from stack }
else { Not balanced stack }
```
- 4) if (isEmpty()) { Balanced expression }.

Test case .

Sr.No.	I/P	Expected O/P	Actual O/P	Result
1.	(())	Balanced expression.	Balanced expression	Pass.
2.	(()) {	Unbalance expression.	Unbalanced expression	Pass.
3.	()] [un balanced expression.	un balanced expression,	Pass.

conclusion - successfully implemented parenthesis checker using the concept of stack.