ACPCE
Where knowledge is second nature

Jawahar Education Society's
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Course code: CSL301

Semester: 3

Experiment Evaluation Sheet

Experiment No.: 3a

Experiment Name:
Write a program to check weather parenthesis are well formed or not

Sr No.	**Evaluation Criteria**	**Marks (Out of 9)**	**Performance Date**	**Correction Date and Signature of Instructor**
1	**Experiment Performance**			
2	**Journal Performance**			
3	**Punctuality**			
Total				

Code :

```
#include <stdio.h>
#include <string.h>

#define MAX_SIZE 100

typedef struct Stack {
   char data[MAX_SIZE];
   int top;
}Stack;

void initStack(Stack *parenthesis) {
   parenthesis->top = -1;
}

int isFull(Stack *parenthesis) {
   return parenthesis->top == MAX_SIZE - 1;
}

int isEmpty(Stack *parenthesis) {
   return parenthesis->top == -1;
}

void push(Stack *parenthesis, char value) {
   if (isFull(parenthesis)) {
      printf("Stack overflow");
   } else {
      parenthesis->data[++parenthesis->top] = value;
   }
}

int pop(Stack *parenthesis) {
   if (isEmpty(parenthesis)) {
      printf("Parenthesis are not well formed. 😢\n");
      return 0;
   } else {
      int value = parenthesis->data[parenthesis->top--];
      return value;
   }
}

int balacedParenthesis(char *sentence) {
   Stack parenthesis;
   initStack(&parenthesis);
   for (int i = 0; sentence[i] != '\0'; i++) {
      if (sentence[i] == '(')
         push(&parenthesis, sentence[i]);
      else if (sentence[i] == ')' && pop(&parenthesis) != '(') {
         return 0;
      }
   }
   if (isEmpty(&parenthesis)){
      printf("Parenthesis are well formed. 😄\n");
      return 1;
```

Code :

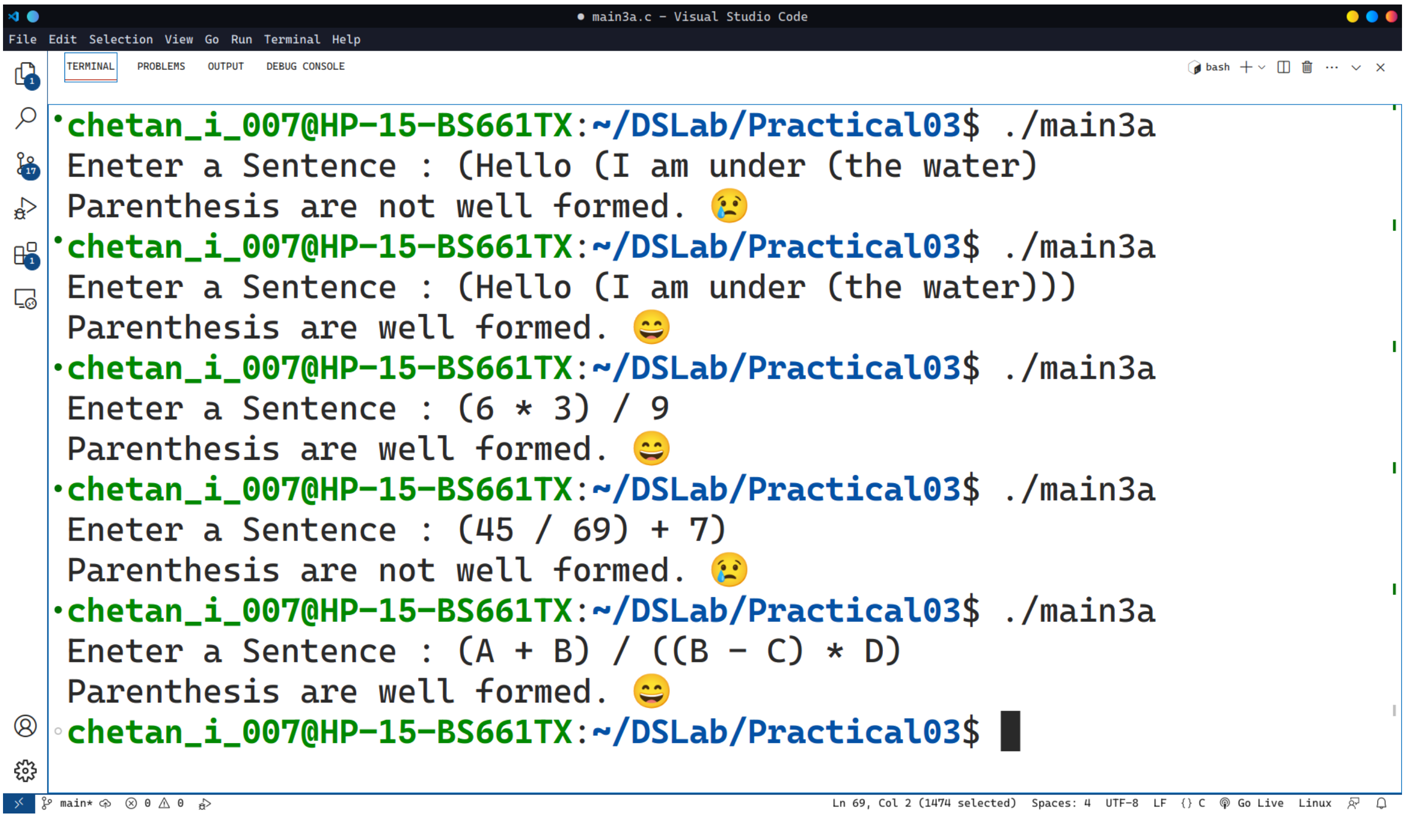
```
        }
        else {
            printf("Parenthesis are not well formed. 😢\n");
            return 0;
        }
    }

    int main() {
        char sentence[100];

        printf("Eneter a Sentence : ");
        fgets(sentence, sizeof(sentence), stdin);
        balacedParenthesis(sentence);

        return 0;
    }
```

Output :


● main3a.c - Visual Studio Code
File Edit Selection View Go Run Terminal Help
TERMINAL PROBLEMS OUTPUT DEBUG CONSOLE
bash
main* ⊗ 0 ⚠ 0
Ln 69, Col 2 (1474 selected) Spaces: 4 UTF-8 LF {} C Go Live Linux

```
chetan_i_007@HP-15-BS661TX:~/DSLab/Practical03$ ./main3a
Eneter a Sentence : (Hello (I am under (the water)
Parenthesis are not well formed. 😢
chetan_i_007@HP-15-BS661TX:~/DSLab/Practical03$ ./main3a
Eneter a Sentence : (Hello (I am under (the water)))
Parenthesis are well formed. 😄
chetan_i_007@HP-15-BS661TX:~/DSLab/Practical03$ ./main3a
Eneter a Sentence : (6 * 3) / 9
Parenthesis are well formed. 😄
chetan_i_007@HP-15-BS661TX:~/DSLab/Practical03$ ./main3a
Eneter a Sentence : (45 / 69) + 7)
Parenthesis are not well formed. 😢
chetan_i_007@HP-15-BS661TX:~/DSLab/Practical03$ ./main3a
Eneter a Sentence : (A + B) / ((B - C) * D)
Parenthesis are well formed. 😄
chetan_i_007@HP-15-BS661TX:~/DSLab/Practical03$ 
```

Conclusion :

Through this experiment we have learnt about how to implement a Stack using the C language.
Various operations like push, pop, isfull, and isempty are applied on the stack.
This experiment helps us in using stack as a data structure for further reference.