**Data Structures using C**

**Lab File**

Submitted to:

**AMITY UNIVERSITY UTTTAR PARDESH**

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**In partial fulfilment of the requirements for the award of the degree of**

**Bachelor of technology**

**In**

Computer Science & Engineering

By

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**AMITY SCHOOL OF ENGINEERING AND TECHNOLOGY**

**AMITY UNIVERSITY UTTAR PARDESH**

**NOIDA (U.P.)**

**LIST OF EXPERIMENTS**

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**Experiment No. 1**

**Program Name:**

**Algorithm:**

**Source Code:**

**Output:**

**#include<stdio.h>**

**#include<stdlib.h>**

**#define MAX 100**

**char stack[MAX];**

**int top = -1;**

**void Parenthesis\_checker(int n, char parenthesis)**

**{**

**printf("Enter string of parenthesis:\n");**

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

**{**

**printf("\nEnter parenthesis %d: ", i);**

**scanf(" %c", &parenthesis);**

**if(parenthesis == '(' || parenthesis == '[' || parenthesis == '{')**

**{**

**PUSH(parenthesis);**

**}**

**else if(parenthesis == ')' || parenthesis == ']' || parenthesis == '}')**

**{**

**if(parenthesis == ')' && stack[top] == '(' || parenthesis == ']' && stack[top] == '[' || parenthesis == '}' && stack[top] == '{')**

**{**

**POP();**

**}**

**else**

**{**

**printf("Unbalanced parenthesis string.");**

**}**

**}**

**}**

**if(top == -1)**

**{**

**printf("\nString of Parenthesis is balanced.\n");**

**}**

**else**

**{**

**printf("\nUnbalanced parenthesis string.\n");**

**printf("Following parenthesis have missing pairs:\n");**

**for(int i = 0; i <= top; i++)**

**{**

**printf(" %d\n", stack[i]);**

**}**

**}**

**}**

**void PUSH(char parenthesis)**

**{**

**if(top == (MAX - 1))**

**{**

**printf("Stack full.\n");**

**}**

**else**

**{**

**top++;**

**stack[top] = parenthesis;**

**printf("%s pushed to stack.\n", parenthesis);**

**}**

**}**

**void POP()**

**{**

**if(top == -1)**

**{**

**printf("Stack empty.\n");**

**}**

**else**

**{**

**printf("%s poppes from stack.\n", stack[top]);**

**top--;**

**}**

**}**

**int main()**

**{**

**char parenthesis;**

**int n;**

**printf("Enter string length: ");**

**scanf("%d", &n);**

**Parenthesis\_checker(n, parenthesis);**

**return 0;**

**}**