Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 3_CY

Attempt : 1
Total Mark : 30
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Raj is a software developer, and his team is building an application that processes user inputs in the form of strings containing brackets. One of the essential features of the application is to validate whether the input string meets specific criteria.

During testing, Raj inputs the string "(([])){}". The application correctly returns "Valid string" because the input satisfies the criteria: every opening bracket (, [, and { has a corresponding closing bracket),], and }, arranged in the correct order.

Next, Raj tests the application with the string "([)]". This time, the application correctly returns "Invalid string" because the opening bracket [is incorrectly closed by the bracket), which violates the validation rules.

Finally, Raj enters the string "{[()]}". The application correctly identifies it as a "Valid string" since all opening brackets are matched with the corresponding closing brackets in the correct order.

As a software developer, Raj's responsibility is to ensure that the application works reliably and produces accurate results for all input strings, following the validation rules. He accomplishes this by using a method for solving such problems.

Input Format

The input comprises a string representing a sequence of brackets that need to be validated.

Output Format

The output prints "Valid string" if the string is valid. Otherwise, it prints "Invalid string".

Refer to the sample output for formatting specifications.

Sample Test Case

Input: (([])){}
Output: Valid string

Answer

-

Status : - ***Marks : 0/10***

2. Problem Statement

Suppose you are building a calculator application that allows users to enter mathematical expressions in infix notation. One of the key features of your calculator is the ability to convert the entered expression to postfix notation using a Stack data structure.

Write a function to convert infix notation to postfix notation using a Stack.

Input Format

The input consists of a string, an infix expression that includes only digits(0-9), and operators(+, -, *, /).

Output Format

The output displays the equivalent postfix expression of the given infix expression.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 1+2*3/4-5
Output: 123*4/+5-

Answer

-

Status : Skipped ***Marks : 0/10***

3. Problem Statement

Buvi is working on a project that requires implementing an array-stack data structure with an additional feature to find the minimum element.

Buvi needs to implement a program that simulates a stack with the following functionalities:

Push: Adds an element onto the stack.Pop: Removes the top element from the stack.Find Minimum: Finds the minimum element in the stack.

Buvi's implementation should efficiently handle these operations with a maximum stack size of 20.

Input Format

The first line of input consists of an integer N, representing the number of elements to push onto the stack.

The second line consists of N space-separated integer values, representing the elements to be pushed onto the stack.

Output Format

The first line of output displays "Minimum element in the stack: " followed by the minimum element in the stack after pushing all elements.

The second line displays "Popped element: " followed by the popped element.

The third line displays "Minimum element in the stack after popping: " followed by the minimum element in the stack after popping one element.

Refer to the sample output for the formatting specifications.

Sample Test Case

Input: 4
5 2 8 1

Output: Minimum element in the stack: 1
Popped element: 1
Minimum element in the stack after popping: 2

Answer

```
// You are using GCC
#include<stdio.h>
#include<stdlib.h>
typedef struct node{
    int data;
    struct node*next;
}stack;
stack* top=NULL;
void push(int val){
    stack*newn=(stack*)malloc(sizeof(stack));
    newn->data=val;
    newn->next=top;
    top=newn;
}
void pop(){
    if(top==NULL){
        return;
```

```
    }
    else{
        stack*temp=top;
        top=top->next;
        printf("Popped element: %d\n",temp->data);
        free(temp);
    }
}
void display(){
    if(top==NULL){
        return;
    }
    else{
        stack*temp=top;
        int min=temp->data;
        while(temp!=NULL){
            if(temp->data<min){
                min=temp->data;
            }
            temp=temp->next;
        }
        printf("%d\n",min);
    }
}
int main(){
    int n;
    scanf("%d",&n);
    for(int i=0;i<n;i++){
        int value;
        scanf("%d",&value);
        push(value);
}
printf("Minimum element in the stack: ");
display();
pop();
printf("Minimum element in the stack after popping: ");
display();
}
```

Status : Correct **Marks : 10/10**