Vallurupalli Nageswara Rao Vignana Jyothi Institute of Engineering &Technology

Name :Immadi Harshita .
Roll no:23071A0583
Branch :VNRVJIET
Batch :2027
Email :immadiharshita@gmail.com
Phone :9063972744
Department :CSE
Degree :B.Tech CSE

2023_27_II_CSE 2_Data Structures_lab

DATA STRUCTURES_ASSESSMENT_WEEK 7

Attempt : 1
Total Mark : 20
Marks Obtained : 20

Section 1 : Coding

1. Problem Statement

Siri is a computer science student who loves solving mathematical problems. She recently learned about infix and postfix expressions and was fascinated by how they can be used to evaluate mathematical expressions.

She decided to write a program to convert an infix expression with operators to its postfix form. Help Siri in writing the program.

Answer

```
// You are using GCC
#include<stdio.h>
#include<ctype.h>
#include<string.h>
#define MAX 100
char stack[MAX];
int top=-1;
void push(int ele)
```

```
{
   ++top;
   stack[top]=ele;
}
char pop()
{
   return(stack[top--]);
}
void postfix(char infix[])
{
   int prece(char);
   int i,j=0;
   char post[100];
   for(i=0;infix[i]!='\0';i++)
   {
      if(infix[i]=='('
      {
         push(infix[i]);
      }
      else if(isdigit(infix[i])>0)
      {
         post[j++]=infix[i];
      }
      else if(infix[i]==')')
      {
         while(stack[top]!='('
         {
            post[j++]=pop();
         }
         pop();
      }
      else
      {
         while(prece(stack[top])>=prece(infix[i]))
         {
            post[j++]=pop();
         }
         push(infix[i]);
      }
   }
   post[j]='\0';
   printf("%s",post);
```

```
}
int prece(char op)
{
   if(op=='(')
    return 0;
   else if(op=='+'||op=='-')
    return 1;
   else if(op=='*'||op=='/')
    return 2;
}
int main()
{
   char infix[100];
   scanf("%[^\n]",infix);
   push('(');
   strcat(infix,")");
   postfix(infix);
}
```

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

2. Problem statement

You are tasked with implementing a program that reverses a string using a stack data structure. The program takes an input string and utilizes a stack to reverse the order of characters in the string. The reversed string is then printed as the output.

Example:

Input:

JNCAB

Output:

BACNJ

Explanation:

letter="JNCAB"letter[0]="J" => push() => Stack=Jletter[1]="N" => push() => Stack=JNletter[2]="C" => push() => Stack=JNCletter[3]="A" => push() => Stack=JNCAletter[4]="B" => push() => Stack=JNCABNow, one by one, pop()

and print the top-most elements.

Answer

```
// You are using GCC
#include<stdio.h>
#define MAX 100
int top=-1;
char stack[MAX];
void push(char ch)
{
   stack[++top]=ch;
}
char pop()
{
   return(stack[top--]);
}
int main()
{
   char str[100],rev[100];
   int i,j;
   scanf("%[^\n]",str);
   for(i=0;str[i]!='\0';i++)
   {
      push(str[i]);
   }
   j=0;
   while(top!=-1)
   {
      rev[j++]=pop();
   }
   rev[j]='\0';
   printf("%s",rev);
}
```

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