MANAN GOHIL
A11_SYIT

Source code:-

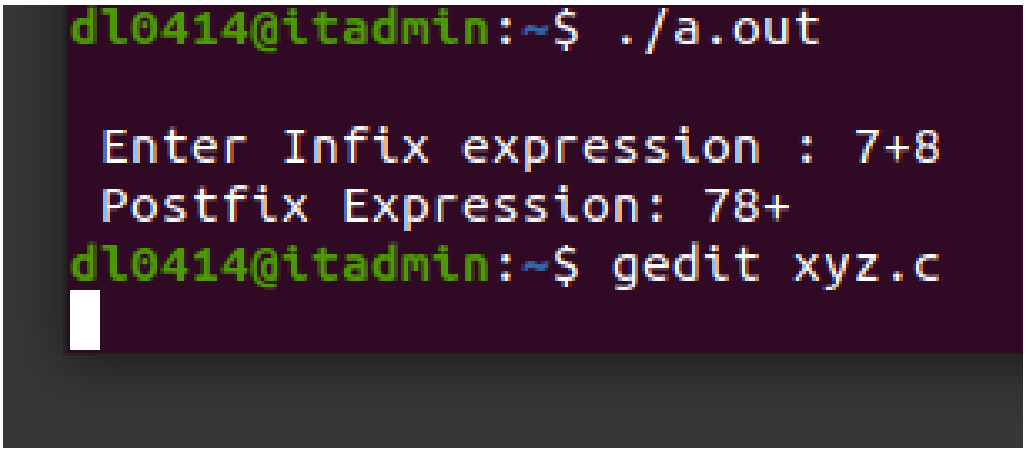
```
#include<stdio.h>
#include<stdlib.h>
#include<ctype.h>
#include<string.h>

#define SIZE 100
char stack[SIZE];
int top = -1;

/* === define push operation === */
void push(char item)
{
   if(top >= SIZE-1)
   {
         printf("\n Stack Overflow.");
   }
   else
   {
         top = top+1;
         stack[top] = item;
   }
}

/* === define pop operation === */
char pop()
{
   char item ;

   if(top <0)
   {
         printf("stack under flow: invalid infix expression");
         getchar();
         /* underflow may occur for invalid expression */
         /* where ( and ) are not matched */
         exit(1);
   }
   else
   {
         item = stack[top];
```

```
            top = top-1;
            return(item);
    }
}

/* === define function that is used to determine whether any symbol is operator or not
            this fucntion returns 1 if symbol is opreator else return 0 === */

int is_operator(char symbol)
{
    if(symbol == '^' || symbol == '*' || symbol == '/' || symbol == '+' || symbol =='-')
    {
            return 1;
    }
    else
    {
    return 0;
    }
}

/* === define fucntion that is used to assign precendence to operator.
            Here ^ denotes exponent operator.
            In this fucntion we assume that higher integer value means higher precendence === */

int precedence(char symbol)
{
    if(symbol == '^')
    {
            return(3);
    }
    else if(symbol == '*' || symbol == '/')
    {
            return(2);
    }
    else if(symbol == '+' || symbol == '-')
    {
            return(1);
    }
    else
    {
            return(0);
    }
}
```

```
void InfixToPostfix(char infix_exp[], char postfix_exp[])
{
    int i, j;
    char item;
    char x;

    push('(');                  /* push '(' onto stack */
    strcat(infix_exp,")");          /* add ')' to infix expression */

    i=0;
    j=0;
    item=infix_exp[i];

    while(item != '\0')
    {
            if(item == '(')
            {
                    push(item);
            }
            else if( isdigit(item) || isalpha(item))
            {
                    postfix_exp[j] = item;          /* add operand symbol to postfix expr */
                    j++;
            }
            else if(is_operator(item) == 1)         /* means symbol is operator */
            {
                    x=pop();
                    while(is_operator(x) == 1 && precedence(x)>= precedence(item))
                    {
                            postfix_exp[j] = x;     /* so pop all higher precendence operator and */
                            j++;
                            x = pop();              /* add them to postfix expresion */
                    }
                    push(x);

                    push(item);                     /* push current oprerator symbol onto stack */
            }
            else if(item == ')')                /* if current symbol is ')' then */
            {
                    x = pop();                  /* pop and keep popping until */
                    while(x != '(')             /* '(' encounterd */
                    {
                            postfix_exp[j] = x;
                            j++;
```

```
                        x = pop();
                }
        }
        else
        {   /* if current symbol is neither operand not '(' nor ')' and nor operator */
                printf("\nInvalid infix Expression.\n");
                getchar();
                exit(1);
        }
        i++;


        item = infix_exp[i];
    }
    if(top>0)
    {
        printf("\nInvalid infix Expression.\n");
        getchar();
        exit(1);
    }


    postfix_exp[j] = '\0'; /* add sentinel else puts() fucntion */
    /* will print entire postfix[] array upto SIZE */

}

/* === main function begins === */
int main()
{
    char infix[SIZE], postfix[SIZE];

    printf("\n Enter Infix expression : ");
    gets(infix);

    InfixToPostfix(infix,postfix);
    printf(" Postfix Expression: ");
    puts(postfix);

    return 0;
}
```

OUTPUT:-


dl0414@itadmin:~$ ./a.out
Enter Infix expression : 7+8
Postfix Expression: 78+
dl0414@itadmin:~$ gedit xyz.c