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LAB 3 : Infix to Postfix

QUESTION:

WAP to convert a given valid parenthesized infix arithmetic expression to postfix expression. The expression consists of single character operands and the binary operators + (plus), - (minus), \* (multiply) and / (divide)

CODE:

#include<stdio.h>

#include<stdlib.h>

#include<ctype.h>

#include<string.h>

#define SIZE 100

char stack[SIZE];

int top = -1;

void push(char item)

{

if(top >= SIZE-1)

{

printf("\nStack Overflow.");

}

else

{

top = top+1;

stack[top] = item;

}

}

char pop()

{

char item ;

if(top <0)

{

printf("stack under flow: invalid infix expression");

getchar();

exit(1);

}

else

{

item = stack[top];

top = top-1;

return(item);

}

}

int is\_operator(char symbol)

{

if(symbol == '^' || symbol == '\*' || symbol == '/' || symbol == '+' || symbol =='-')

{

return 1;

}

else

{

return 0;

}

}

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('(');

strcat(infix\_exp,")");

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;

j++;

}

else if(is\_operator(item) == 1)

{

x=pop();

while(is\_operator(x) == 1 && precedence(x)>= precedence(item))

{

postfix\_exp[j] = x;

j++;

x = pop();

}

push(x);

push(item);

}

else if(item == ')')

{

x = pop();

while(x != '(')

{

postfix\_exp[j] = x;

j++;

x = pop();

}

}

else

{

printf("\nInvalid infix Expression.\n");

getchar();

exit(1);

}

i++;

item = infix\_exp[i];

}

if(top>0)

{

printf("\nInvalid infix Expression.\n");

getchar();

exit(1);

}

if(top>0)

{

printf("\nInvalid infix Expression.\n");

getchar();

exit(1);

}

postfix\_exp[j] = '\0';

}

int main()

{

char infix[SIZE], postfix[SIZE];

printf("\nEnter Infix expression : ");

gets(infix);

InfixToPostfix(infix,postfix);

printf("Postfix Expression: ");

puts(postfix);

return 0;

}

OUTPUT:

