

Week 3

1.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).

```
#include<stdio.h>
```

```
#include<stdlib.h>
```

```
#include<string.h>
```

```
#include<ctype.h>
```

```
int F(char symbol)
```

```
{
```

```
    switch(symbol)
```

```
    {
```

```
        case '+' :
```

```
        case '-' : return 2;
```

```
        case '*' :
```

```
        case '/' : return 4;
```

```
        case '^' :
```

```
        case '$' : return 5;
```

```
        case '(' : return 0;
```

```
        case '#' : return -1;
```

```
        default : return 8;
```

```
    }
```

```

}

int G(char symbol)
{
    switch(symbol)
    {
        case '+' :
        case '-' : return 1;
        case '*' :
        case '/' : return 3;
        case '^' :
        case '$' : return 6;
        case '(' : return 9;
        case ')' : return 0;
        default : return 7;
    }
}

void infix_postfix(char infix[],char postfix[])
{
    int top,j,i;
    char s[30];
    char symbol;
    top=-1;
    s[++top]='#';
    j=0;
    for(i=0;i<strlen(infix);i++)
    {

```

```

        symbol=infix[i];
        while(F(s[top])>G(symbol))
        {

                postfix[j]=s[top--];
                j++;
        }
        if(F(s[top])!=G(symbol))
                s[++top]=symbol;
        else
                top--;
    }
    while(s[top]!='#')
    {
            postfix[j++]=s[top--];
    }
    postfix[j]='\0';
}

int main()
{
    char infix[20],postfix[20];
    int k,a=0,b=0,flag=0;
    printf("Enter the valid infix expression:\n");
    scanf("%s",infix);
    for(k=0;k<strlen(infix);k++)
    {

```

```

    if((isalnum(infix[k])&&isalnum(infix[k+1])))
        flag++;

    if(infix[k]=='(')
        a++;
    if(infix[k]==')')
        b++;
}
if(a!=b||flag!=0)
{
    printf("Invalid infix expression!");
    exit(0);
}
infix_postfix(infix,postfix);
printf("The postfix expression is:\n");
printf("%s\n",postfix);
return 0;
}

```

```

C:\Users\RAJ\Desktop\c prog\DS Lab\week 3\infix.postfix.exe
Enter the valid infix expression:
a^b+c-d+e/f/(g+h)
The postfix expression is:
ab^c+d-ef/gh+/+

-----
Process exited after 86.85 seconds with return value 0
Press any key to continue . . .

```

```
C:\Users\RAJ\Desktop\c prog\DS Lab\week 3\infix.postfix.exe
Enter the valid infix expression:
ab+
Invalid infix expression!
-----
Process exited after 8.2 seconds with return value 0
Press any key to continue . . .
```

```
C:\Users\RAJ\Desktop\c prog\DS Lab\week 3\infix.postfix.exe
Enter the valid infix expression:
(a=b-d
Invalid infix expression!
-----
Process exited after 11.86 seconds with return value 0
Press any key to continue . . .
```