```c
#include<stdio.h>
#include<string.h>
int F(char symbol)
{
    switch(symbol)
    {
    case '+':
    case '-': return 1;
    case '*':
    case '/':return 3;
    case '^':
    case '$':return 6;
    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 0;
    case')':return 9;
    default:return 7;
    }
}
void infix_prefix(char infix[],char prefix[])
{
    int top;
    char s[30];
```

```c
37        char s[30];
38        int j;
39        int i;
40        char symbol;
41        top=-1;
42        s[++top]='#';
43        j=0;
44        strrev(infix);
45        for(i=0;i<strlen(infix);i++)
46        {
47            symbol=infix[i];
48
49        while(F(s[top])>G(symbol))
50        {
51            prefix[j]=s[top--];
52            j++;
53        }
54        if(F(s[top])!=G(symbol))
55        s[++top]=symbol;
56        else
57        top--;
58        }
59
60        while(s[top]!='#')
61        {
62            prefix[j++]=s[top--];
63
64        }
65        prefix[j]='\0';
66        strrev(prefix);
67    }
68
69        int main()
70        {
71            char infix[20];
72            char prefix[20];
73            printf("Enter the valid infix expression\n");
74            scanf("%s",infix);
```

```c
66          strrev(prefix);
67      }
68
69      int main()
70      {
71          char infix[20];
72          char prefix[20];
73          printf("Enter the valid infix expression\n");
74          scanf("%s",infix);
75          infix_prefix(infix,prefix);
76          printf("The prefix expression is\n");
77          printf("%s\n",prefix);
78      }
79
```

C:\Users\pbcha\Desktop\DSLAB_Week4_pra2.exe

Enter the valid infix expression
(A+B)*(C+D)
The prefix expression is
*+AB+CD

Process returned 0 (0x0)   execution time : 44.106 s
Press any key to continue.

```c
#include<stdio.h>
#include<math.h>
#include<string.h>
double compute(char symbol,double OP1,double OP2)
{
  switch(symbol)
  {
   case '+':   return OP1+OP2;
   case '-':   return OP1-OP2;
   case '*':   return OP1*OP2;
   case '/':   return OP1/OP2;
   case '$':
   case '^':   return pow(OP1,OP2);
  }
}
void main()
{
 double s[20],res,OP1,OP2;
 int i,top;
 char prefix[20],symbol;
 printf("Enter Prefix expression:\n");
 scanf("%s",prefix);
 strrev(prefix);
 top=-1;
 for(i=0;i<strlen(prefix);i++)
 {
   symbol=prefix[i];
   if(isdigit(symbol))
     s[++top]=symbol-'0';
   else
     {
       OP1=s[top--];
       OP2=s[top--];
       res=compute(symbol,OP1,OP2);
       s[++top]=res;
     }
```

```c
for(i=0;i<strlen(prefix);i++)
{
    symbol=prefix[i];
    if(isdigit(symbol))
        s[++top]=symbol-'0';
    else
        {
            OP1=s[top--];
            OP2=s[top--];
            res=compute(symbol,OP1,OP2);
            s[++top]=res;
        }
}
res=s[top--];
printf("Result=%f\n",res);
}
```

```
Enter Prefix expression:
-+7*45+20
Result=25.000000

Process returned 17 (0x11)   execution time : 25.721 s
Press any key to continue.
```

```c
#include<stdio.h>
int fact(int n)
{
    if(n==0)
        return 1;
    return n*fact(n-1);
}
void main()
{
    int n;
    printf("Enter Value of n:\n");
    scanf("%d",&n);
    printf("The factorial of %d=%d\n",n,fact(n));
}
```

C:\Users\pbcha\Desktop\DSLab_week4_prac3.exe

```
Enter Value of n:
10
The factorial of 10=3628800

Process returned 28 (0x1C)   execution time : 2.439 s
Press any key to continue.
```

```c
#include<stdio.h>
int gcd(int a, int b)
{
  if(a==0)
     return b;
  else if(b==0)
     return a;
  if(a==b)
     return a;
  if(a>b)
     return gcd(a-b,b);
  else
     return gcd(a,b-a);
}
int main()
{
  int a,b;
  printf("Enter two numbers for which GCD is to be found:\n");
  scanf("%d%d",&a,&b);
  printf("GCD=%d\n",gcd(a,b));
}
```

C:\Users\pbcha\Desktop\DSLab_week4_prac4.exe

```
Enter two numbers for which GCD is to be found:
98 56
GCD=14


Process returned 0 (0x0)   execution time : 2.290 s
Press any key to continue.
```