S.No: 39	Exp. Name: ***Infix to Prefix Conversion***	Date:2023-07-01

Aim:

Write a C program to convert an Infix expression to Prefix expression.

Source Code:

infixToPrefix.c

```
#define SIZE 50
#include<string.h>
#include <ctype.h>
#include<stdio.h>
char *strrev(char *str)
{
    char c, *front, *back;
     if(!str || !*str)
      {
          return str;
      }
       for(front=str,back=str+strlen(str)-1;front < back;front++,back--)
        {
          c=*front;
           *front=*back;
            *back=c;
        }
         return str;
}
char s[SIZE];
int top = -1;
void push (char elem)
{
   s[++top] = elem;
}
char pop ()
{
   return (s[top--]);
}
int pr (char elem)
{
    switch (elem)
     {
       case '#':
        return 0;
         case ')':
          return 1;
           case '+':
            case '-':
             return 2;
              case '*':
               case '/':
                return 3;
     }
}
void main ()
```

```
{
    char infx[50], prfx[50], ch, elem;
     int i = 0, k = 0;
      printf ("Enter Infix Expression:");
       scanf ("%s", infx);
        push ('#');
         strrev (infx);
          while ((ch = infx[i++]) != '\0')
           {
             if (ch == ')')
              push (ch);
               else if (isalnum (ch))
                prfx[k++] = ch;
                 else if (ch == '(')
                  {
                      while (s[top] != ')')
                       {
                         prfx[k++] = pop ();
                       }
                        elem = pop ();
                  }
                   else
                    {
                      while (pr (s[top]) >= pr (ch))
                      {
                         prfx[k++] = pop ();
                      }
                       push (ch);
                    }
           }
            while (s[top] != '#')
             {
                prfx[k++] = pop ();
             }
              prfx[k] = '\0';
               strrev (prfx);
                strrev (infx);
                 printf ("Prefix Expression:%s\n", prfx);
}
```

Execution Results - All test cases have succeeded!

Test Case - 1
User Output
`Enter Infix Expression: A+B`
`Prefix Expression:+AB`

Test Case - 2
User Output
`Enter Infix Expression: A/B+C/D`
`Prefix Expression:+/AB/CD`