

WEEK 4 PRACTICE PROGRAMS

1. Infix to prefix

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

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

```
#include <process.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 2;
        case '*':
```

case '/':

return 4;

case '^':

case '\$':

return 5;

case '(':

return 0;

case ')':

return 9;

default:

return 7;

}

}

void infix_prefix(char infix[], char prefix[])

{

int top, j, i;

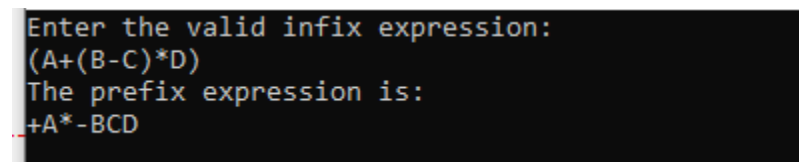
char s[30], symbol;

```
top = -1;
s[++top] = '#';
j = 0;
strrev(infix);
for (i = 0; i < strlen(infix); i++)
{
    symbol = infix[i];
    while (F(s[top]) > G(symbol))
    {
        prefix[j] = s[top--];
        j++;
    }
    if (F(s[top]) != G(symbol))
    {
        s[++top] = symbol;
    }
    else
```

```
    {  
        top--;  
    }  
}  
while (s[top] != '#')  
{  
    prefix[j++] = s[top--];  
}  
prefix[j] = '\\0';  
strrev(prefix);  
}
```

```
void main()  
{  
    char infix[30], prefix[30];  
    printf("Enter the valid infix expression:\\n");  
    scanf("%s", infix);
```

```
infix_prefix(infix, prefix);  
  
printf("The prefix expression is:\n");  
  
printf("%s\n", prefix);  
  
}
```



```
Enter the valid infix expression:  
(A+(B-C)*D)  
The prefix expression is:  
+A*-BCD
```

2. Evaluation of postfix

```
#include <stdio.h>  
  
#include <stdlib.h>  
  
#include <string.h>  
  
#include <math.h>  
  
//evaluation of postfix  
  
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);
}

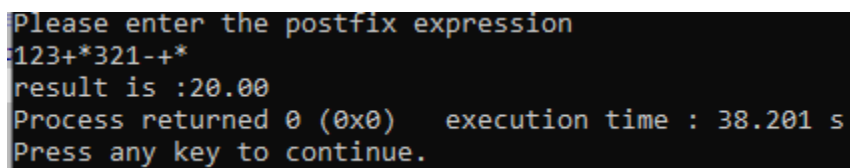
}

int main()
{
    double s[20];
    double res;
    double op1,op2;
    int top,i;
    char postfix[20],symbol;
```

```
printf("Please enter the postfix expression");  
scanf("%s",postfix);  
top=-1;  
for(int i=0;i<strlen(postfix);i++)  
{  
    symbol=postfix[i];  
    if(isdigit(symbol))  
    {  
        s[++top]=symbol-'0';  
    }  
    else  
    {  
        op2=s[top--];  
        op1=s[top--];  
        res=compute(symbol,op1,op2);  
        s[++top]=res;  
    }  
}
```



```
}  
  
res=s[top--];  
  
printf("result is :%0.2f",res);  
  
return 0;  
  
}
```

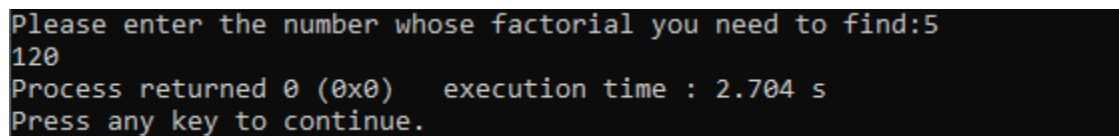


A terminal window with a dark background and light green text. It shows the prompt 'Please enter the postfix expression', followed by the input '123+*321-+*', the output 'result is :20.00', the status 'Process returned 0 (0x0) execution time : 38.201 s', and the instruction 'Press any key to continue.'.

3. Factorial by Recursion

```
#include <stdio.h>  
  
#include <stdlib.h>  
  
int fact(int n)  
{  
    return((n==0)?1:(n*fact(n-1)));  
}  
  
int main()  
{  
    int n;
```

```
    printf("Please enter the number whose factorial you  
need to find:");  
  
    scanf("%d",&n);  
  
    int res=fact(n);  
  
    printf("%d",res);  
  
    return 0;  
  
}
```

A screenshot of a terminal window with a black background and green text. It shows the output of the factorial program: 'Please enter the number whose factorial you need to find:5', followed by '120' on the next line. Below that, it says 'Process returned 0 (0x0) execution time : 2.704 s' and 'Press any key to continue.'

```
Please enter the number whose factorial you need to find:5  
120  
Process returned 0 (0x0) execution time : 2.704 s  
Press any key to continue.
```

4. GCD by Recursion

```
#include <stdio.h>  
  
#include <stdlib.h>  
  
int gcd(int a,int b)  
{  
    return ((b==0)?a:gcd(b,a%b));  
}  
  
int main()
```

```
{  
    int x,y;  
    printf("Please enter the values a and b:");  
    scanf("%d",&x);  
    scanf("%d",&y);  
    int res=gcd(x,y);  
    printf("%d",res);  
    return 0;  
}
```

```
Please enter the values a and b:  
66  
99  
33
```