Aim:

Write a Program to evaluate given Postfix expression.

Constraint: The entered expression must be a valid postfix expression, according to the test scenarios.

Source Code:

PostfixEvaluation.c

```c
#include<stdio.h>
#include<ctype.h>
int stack[20];
int top=-1;
void push(int x);
int pop();
void push(int x)
{
    top++;
    stack[top]=x;
}
int pop()
{
    int r;
    r=stack[top];
    top--;
    return r;
}
void main()
{
    char exp[30];
    int i,v,n1,n2;
    printf("Enter the postfix expression ::");
    gets(exp);
    for(i=0;exp[i]!='\0';i++)
    {
        if(isalpha(exp[i]))
        {
            printf("Enter the value of %c:",exp[i]);
            scanf("%d",&v);
            push(v);
        }
        else if (isdigit(exp[i]))
        {
            push(exp[i]-'0');
        }
        else
        {
            n2=pop();
            n1=pop();
            switch(exp[i])
            {
                case '+' : {
                    push(n1+n2);
```

```
            break;
        }
        case '-' : {
            push(n1-n2);
            break;
        }
        case '*' : {
            push(n1*n2);
            break;
        }
        case '/' : {
            push(n1/n2);
            break;
        }
        case '%' : {
            push(n1%n2);
            break;
        }
        case '^' : {
            push(n1^n2);
            break;
        }
        default:printf("Enter valid option\n");
        }
      }
    }
  }
  printf("The result of expression %s = %d\n",exp,stack[top]);
}
```

Execution Results - All test cases have succeeded!

Test Case - 1

User Output
Enter the postfix expression :: ab+cd-*
Enter the value of a: 2
Enter the value of b: 3
Enter the value of c: 2
Enter the value of d: 4
The result of expression ab+cd-* = -10

Test Case - 2

User Output
Enter the postfix expression :: a*b*c
Enter the value of a: 1
Enter the value of b: 2
Enter the value of c: 3
The result of expression a*b*c = 3