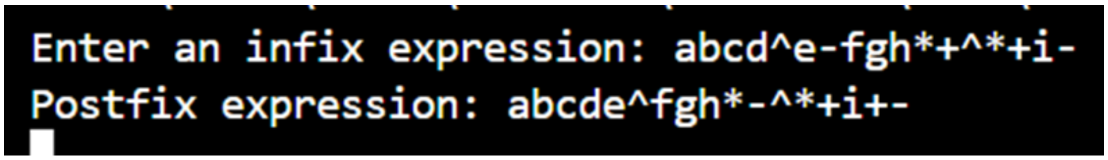
Program 2

Write A Program 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)

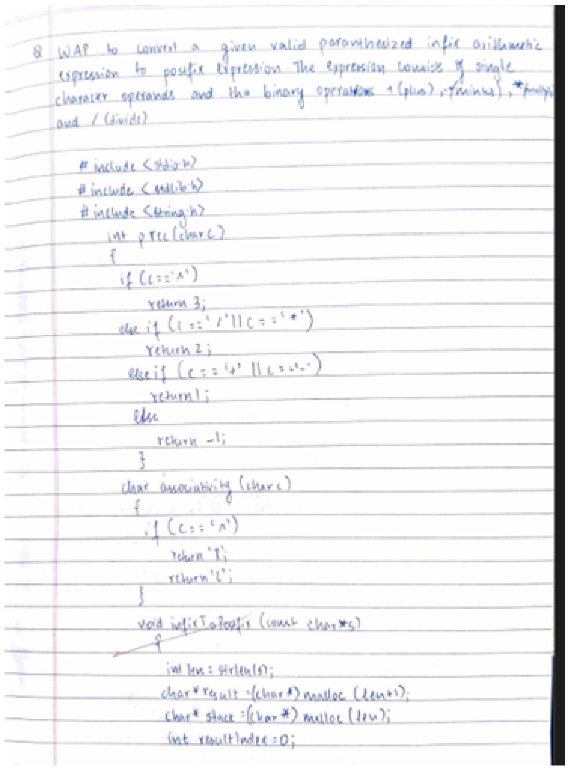
Code:

```
#include <stdio.h>

#include <stdlib.h>

#include <ctype.h>

#include <string.h>


#define MAX 5


char stack[MAX];

int top = -1;


void push(char c) {

   if (top < MAX - 1) {

       stack[++top] = c;

   }

}

char pop() {

   if (top >= 0) {

       return stack[top--];
```

```
    }
    return '\0';
}
char peek() {
    if (top >= 0) {
        return stack[top];
    }
    return '\0';
}

int precedence(char c) {
    switch (c) {
        case '+': return 1;
        case '-': return 1;
        case '*': return 2;
        case '/': return 2;
        case '^': return 3;
        default: return 0;
    }
}


int isOperator(char c) {
    return c == '+' || c == '-' || c == '*' || c == '/'|| c=='^';
}


void infixToPostfix(const char *infix, char *postfix) {
    int i = 0, j = 0;
    while (infix[i]) {
        if (isalnum(infix[i])) {
            postfix[j++] = infix[i];
        } else if (infix[i] == '(') {
            push(infix[i]);
        } else if (infix[i] == ')') {
            while (top != -1 && peek() != '(') {
                postfix[j++] = pop();
            }
            pop();
        } else if (isOperator(infix[i])) {
            while (top != -1 && precedence(peek()) >= precedence(infix[i])) {
                postfix[j++] = pop();
            }
            push(infix[i]);
        }
        i++;
    }
    while (top != -1) {
        postfix[j++] = pop();
    }
    postfix[j] = '\0';
}


int main() {
    char infix[MAX], postfix[MAX];


    printf("Enter an infix expression: ");
    scanf("%s", infix);


    infixToPostfix(infix, postfix);
    printf("Postfix expression: %s\n", postfix);


    return 0;
}
```

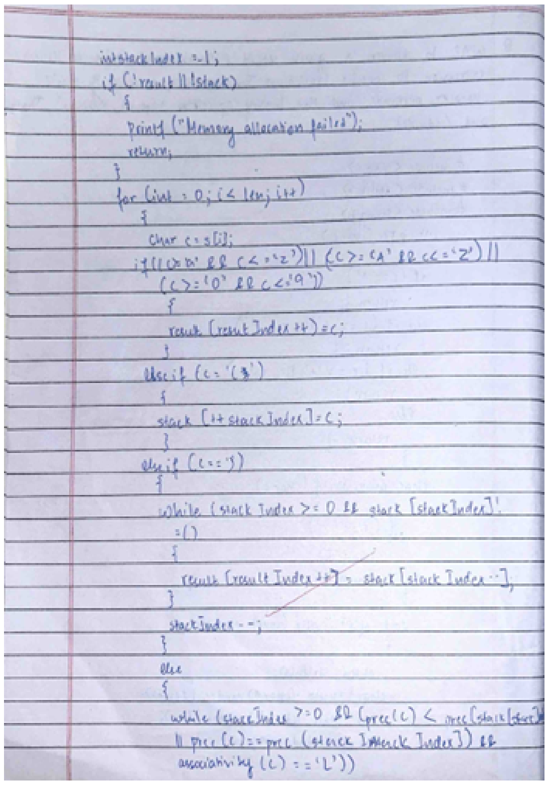


```
Enter an infix expression: abcd^e-fgh*+^*+i-
Postfix expression: abcde^fgh*-^*+i+-
```

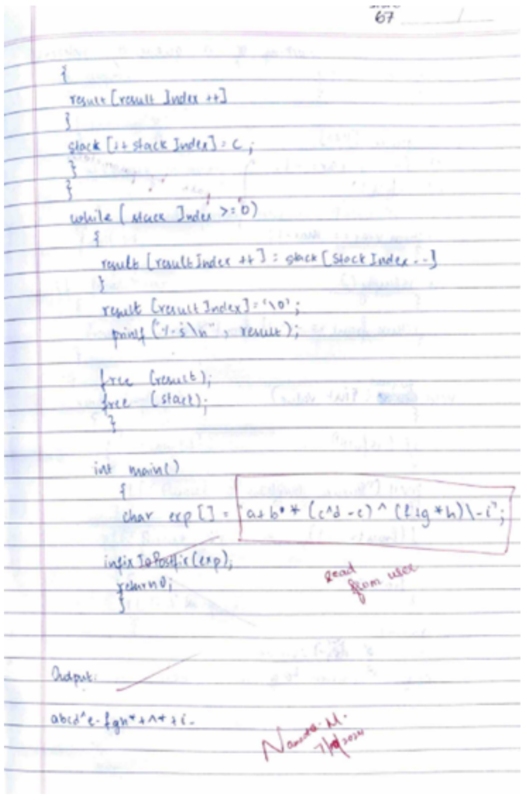


Q WAP to convert a given valid parenthesized infix arithmetic expression to postfix expression. The expression consists of single character operands and the binary operators +(plus), -(minus), *(multiply) and / (divide)

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
   int prec(char c)
   {
    if (c=='^')
       return 3;
    else if (c=='/'||c=='*')
       return 2;
     else if (c=='+' ||c=='-')
       return 1;
     else
       return -1;
     }
    char associativity (char c)
     {
      if (c=='^')
         return 'R';
         return 'L';
     }
     void infixToPostfix (const char*s)
       {
         int len = strlen(s);
         char* result =(char*) malloc (len+1);
         char* stack =(char*) malloc (len);
         int resultIndex =0;
```



```
int stackIndex =-1;
if (!result || !stack)
  {
   printf ("Memory allocation failed");
   return;
  }
 for (int i = 0; i< len; i++)
    {
     char c = s[i];
    if((c>='a' && c<='z')|| (c>='A' && c<='Z')||
       (c>='0' && c<='9'))
       {
       result (result Index ++) = c;
       }
     else if (c='(')
       {
       stack [++ stack Index]= c;
       }
     else if (c==')')
      {
       while (stack Index >= 0 && stack [stack Index]!
        ='(')
        {
         result [result Index ++] = stack [stack Index --];
        }
        stack Index --;
       }
       else
       {
        while (stack Index >=0 && (prec(c) < prec(stack[stack
        || prec(c)==prec (stack [stack Index]) &&
         associativity (c) == 'L'))
```



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```
 {
  result [result Index ++]
 }
 stack [++ stack Index] = c;
 }
 }
 while ( stack Index >= 0)
   {
    result [result Index ++] = stack [stack Index --]
   }
    result [result Index]='\0';
    printf ("%s\n", result);

    free (result);
    free (stack);
    }

  int main()
    {
     char exp[] = "a+b*(c^d-e)^(f+g*h)-i";

   infixToPostfix(exp);
    return 0;
    }
```

read from user

Output:

```
abcd^e-fgh*+^*+i-
```

[illegible]