Exp. No. 20

Write a C program to compute TRAILING( ) – operator precedence parser for the given grammar

E → E + T | T

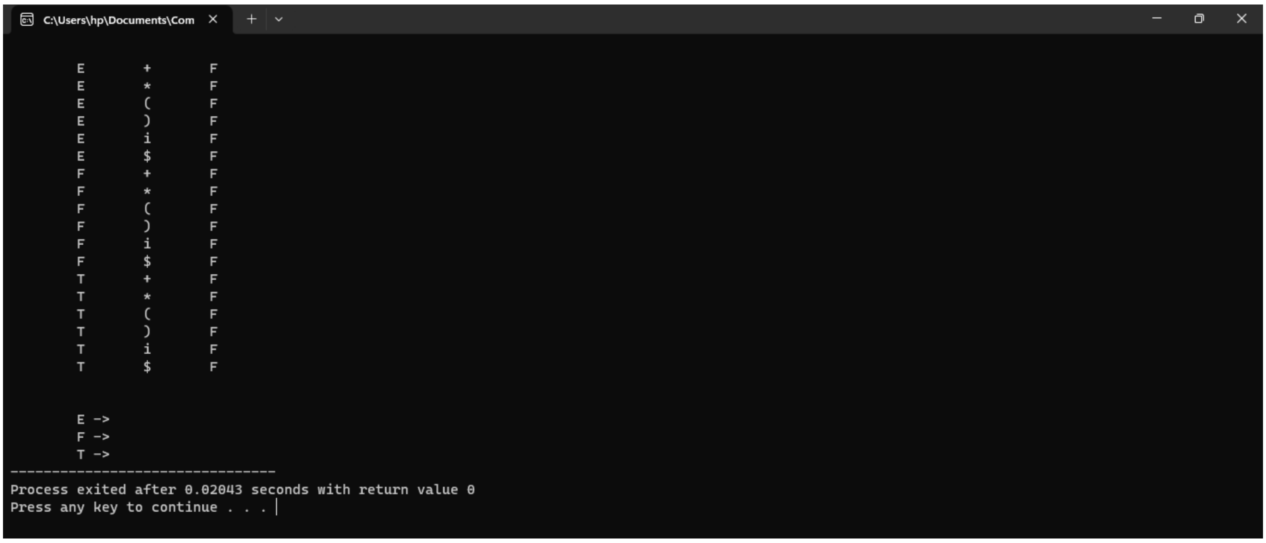
T → T * F | F
F → (E) | id

Program:

```
#include<conio.h>
#include<stdio.h>
char arr[18][3] ={{'E', '+', 'F'},  {'E', '*', 'F'}, {'E', '(', 'F'},    {'E', ')', 'F'},    {'E', 'i', 'F'},
    {'E', '$', 'F'},    {'F', '+', 'F'},    {'F', '*', 'F'},    {'F', '(', 'F'},    {'F', ')', 'F'},    {'F', 'i', 'F'},
    {'F', '$', 'F'},    {'T', '+', 'F'},    {'T', '*', 'F'},    {'T', '(', 'F'},    {'T', ')', 'F'},    {'T', 'i', 'F'},
    {'T', '$', 'F'},
};
char prod[ ] = "EETTFF";
char res[6][3] ={    {'E', '+', 'T'},    {'T', '\0', '\0'},    {'T', '*', 'F'},    {'F', '\0', '\0'},    {'(', 'E',
')'},   {'i', '\0', '\0'},};
char stack [5][2];
int top = -1;

void install(char pro, char re) {
    int i;
    for (i = 0; i < 18; ++i) {
        if (arr[i][0] == pro && arr[i][1] == re) {
                            }
    }
    ++top;
    arr[i][2] = 'T';



    stack[top][0] = pro;
    stack[top][1] = re;
}

int main() {
    int i = 0, j;
    char pro, re, pri = ' ';
    for (i = 0; i < 6; ++i) {
        for (j = 2; j >= 0; --j) {

            if (res[i][j] == '+' || res[i][j] == '*' || res[i][j] == '(' || res[i][j] == ')' || res[i][j] ==
'i' || res[i][j] == '$') {
                install(prod[i], res[i][j]);
                break;
            } else if (res[i][j] == 'E' || res[i][j] == 'F' || res[i][j] == 'T') {
                if (res[i][j - 1] == '+' || res[i][j - 1] == '*' || res[i][j - 1] == '(' || res[i][j -
                        1] == ')' || res[i][j - 1] == 'i' || res[i][j - 1] == '$') {
                    install(prod[i], res[i][j - 1]);
                    break;
                }
            }
        }
    }

    while (top >= 0) {
        pro = stack[top][0];
        re = stack[top][1];
        --top;
        for (i = 0; i < 6; ++i) {
            for (j = 2; j >= 0; --j) {
                if (res[i][0] == pro && res[i][0] != prod[i]) {
                    install(prod[i], re);
                    break;
                } else if (res[i][0] != '\0') break;
            }
        }
    }
    for (i = 0; i < 18; ++i) {
        printf("\n\t");
        for (j = 0; j < 3; ++j)
            printf("%c\t", arr[i][j]);
    }
    printf("\n\n");
```

```
for (i = 0; i < 18; ++i) {
    if (pri != arr[i][0]) {
        pri = arr[i][0];
        printf("\n\t%c -> ", pri);
    }
    if (arr[i][2] == 'T')
        printf("%c ", arr[i][1]);}
}
```

OUTPUT:



```

        E       +       F
        E       *       F
        E       (       F
        E       )       F
        E       i       F
        E       $       F
        F       +       F
        F       *       F
        F       (       F
        F       )       F
        F       i       F
        F       $       F
        T       +       F
        T       *       F
        T       (       F
        T       )       F
        T       i       F
        T       $       F


        E ->
        F ->
        T ->
--------------------------------
Process exited after 0.02043 seconds with return value 0
Press any key to continue . . .
```