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LAB - 4

COMPILER DESIGN

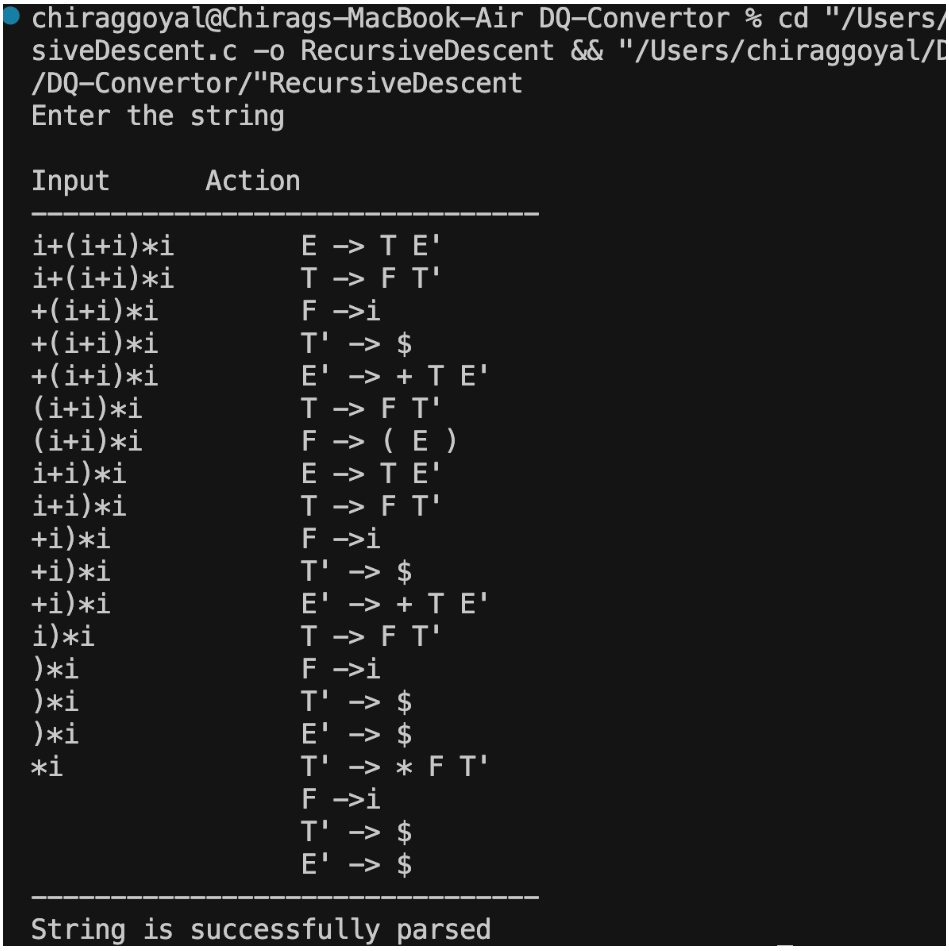
Q1 Write a program to implement recursive descent laser.

Code

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

#define SUCCESS 1
#define FAILED 0

int E(), Edash(), T(), Tdash(), F();

const char *cursor;
char string[64];

int main()
{
    puts("Enter the string");
    // scanf("%s", string);
    sscanf("i+(i+i)*i", "%s", string);
    cursor = string;
    puts("");
    puts("Input     Action");
    puts("--------------------------------");

    if (E() && *cursor == '\0') {
        puts("--------------------------------");
        puts("String is successfully parsed");
        return 0;
    } else {
        puts("--------------------------------");
        puts("Error in parsing String");
        return 1;
    }
}

int E()
{
    printf("%-16s E -> T E'\n", cursor);
    if (T()) {
        if (Edash())
            return SUCCESS;
        else
            return FAILED;
    } else
        return FAILED;
}

int Edash()
{
    if (*cursor == '+') {
        printf("%-16s E' -> + T E'\n", cursor);
        cursor++;
        if (T()) {
            if (Edash())
                return SUCCESS;
            else
                return FAILED;
        } else
            return FAILED;
    } else {
        printf("%-16s E' -> $\n", cursor);
        return SUCCESS;
    }
}

int T()
{
    printf("%-16s T -> F T'\n", cursor);
    if (F()) {
        if (Tdash())
            return SUCCESS;
        else
            return FAILED;
    } else
```

```
        return FAILED;
}

int Tdash()
{
    if (*cursor == '*') {
        printf("%-16s T' -> * F T'\n", cursor);
        cursor++;
        if (F()) {
            if (Tdash())
                return SUCCESS;
            else
                return FAILED;
        } else
            return FAILED;
    } else {
        printf("%-16s T' -> $\n", cursor);
        return SUCCESS;
    }
}

int F()
{
    if (*cursor == '(') {
        printf("%-16s F -> ( E )\n", cursor);
        cursor++;
        if (E()) {
            if (*cursor == ')') {
                cursor++;
                return SUCCESS;
            } else
                return FAILED;
        } else
            return FAILED;
    } else if (*cursor == 'i') {
        cursor++;
        printf("%-16s F ->i\n", cursor);
        return SUCCESS;
    } else
        return FAILED;
}
```

OUTPUT



```
chiraggoyal@Chirags-MacBook-Air DQ-Convertor % cd "/Users/
siveDescent.c -o RecursiveDescent && "/Users/chiraggoyal/D
/DQ-Convertor/"RecursiveDescent
Enter the string

Input      Action
--------------------------------
i+(i+i)*i        E -> T E'
i+(i+i)*i        T -> F T'
+(i+i)*i         F ->i
+(i+i)*i         T' -> $
+(i+i)*i         E' -> + T E'
(i+i)*i          T -> F T'
(i+i)*i          F -> ( E )
i+i)*i           E -> T E'
i+i)*i           T -> F T'
+i)*i            F ->i
+i)*i            T' -> $
+i)*i            E' -> + T E'
i)*i             T -> F T'
)*i              F ->i
)*i              T' -> $
)*i              E' -> $
*i               T' -> * F T'
                 F ->i
                 T' -> $
                 E' -> $
--------------------------------
String is successfully parsed
```