Compiler Construction

D2

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AIM: To implement a Recursive Descent Parser Algorithm for the grammar.

Grammar:

$$
\begin{aligned}
&E \rightarrow T\,E_R \\
&E_R \rightarrow +\,T\,E_R \mid \varepsilon \\
&T \rightarrow F\,T_R \\
&T_R \rightarrow *\,F\,T_R \mid \varepsilon \\
&F \rightarrow (\,E\,) \mid \mathbf{id}
\end{aligned}
$$

Code:

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

char input[10];
int i, error;
void E();
void T();
void Ed();
void Td();
void F();
void main()
{
    i = 0;
    error = 0;
    printf("Enter Arithmetic String :  ");
    gets(input);
    E();
    if (strlen(input) == i && error == 0)
```

```
        printf("\n<--------Accepted------>.\n");
    else
        printf("\n--------Rejected------>\n");
}

void E()
{
    T();
    Ed();
}
void Ed()
{
    if (input[i] == '+')
    {
        i++;
        T();
        Ed();
    }
}
void T()
{
    F();
    Td();
}
void Td()
{
    if (input[i] == '*')
    {
        i++;
        F();
        Td();
```

```
    }
}
void F()
{
    if (isalnum(input[i]))
        i++;
    else if (input[i] == '(')
    {
        i++;
        E();
        if (input[i] == ')')
            i++;

        else
            error = 1;
    }

    else
        error = 1;
}
```

Output:

```
File.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter Arithmetic String :  a+b*c

<--------Accepted------>.
PS D:\MinorProject> cd "d:\MinorProject\" ; if ($?) { gcc tempCodeRunner
File.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter Arithmetic String :  a+b*c+d

<--------Accepted------>.
PS D:\MinorProject> cd "d:\MinorProject\" ; if ($?) { gcc tempCodeRunner
File.c -o tempCodeRunnerFile } ; if ($?) { .\tempCodeRunnerFile }
Enter Arithmetic String :  a++b*c

--------Rejected------>
```