

Exp. No. 19

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

$$E \rightarrow E + T \mid T$$
$$T \rightarrow T * F \mid F$$
$$F \rightarrow (E) \mid \text{id}$$

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[] = "EETTF";
```

```
char res[6][3]={{'E', '+', 'T'}, {'T', '\0'}, {'T', '*', 'F'}, {'F', '\0'}, {'(', 'E', ')'}, {'i', '\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) {
```

```
            arr[i][2] = 'T';
```

```
            break;
```

```
        }
```

```
    }
```

```
    ++top;
```

```
    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 = 0; j < 3 && res[i][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;
        }
    }
}
while (top >= 0) {
    pro = stack[top][0];
    re = stack[top][1];
    --top;
    for (i = 0; i < 6; ++i) {
        if (res[i][0] == pro && res[i][0] != prod[i]) {
            install(prod[i], re);
        }
    }
}
for (i = 0; i < 18; ++i) {
    printf("\n\t");
    for (j = 0; j < 3; ++j)
        printf("%c\t", arr[i][j]);
}
getch();
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]);
}
getch();
}

```

OUTPUT:

```
C:\Users\hp\Documents\Com x + v
E      +      T
E      *      T
E      (      T
E      )      F
E      i      T
E      $      F
F      +      F
F      *      F
F      (      T
F      )      F
F      i      T
F      $      F
T      +      F
T      *      T
T      (      T
T      )      F
T      i      T
T      $      F

E -> + * ( i
F -> ( i
T -> * ( i
-----
Process exited after 43.89 seconds with return value 0
Press any key to continue . . .
```