

EXPERIMENT-15

AIM:

Write a C Program to implement the operator precedence parsing.

PROGRAM:

The screenshot shows the Dev-C++ IDE interface. The main window displays the code for EXP_3.cpp. The code implements an operator precedence parser with a grammar E ? E+E | E*E | (E) | id. It uses a precedence matrix and a stack to handle tokens. The compilation results window at the bottom shows no errors or warnings, indicating a successful build.

```
1 #include <stdio.h>
2 #include <string.h>
3 char precedence[6][6] = {
4     // + * id ( ) $
5     /*+*/ {'>', '<', '<', '<', '>', '>'},
6     /**/ {'>', '>', '<', '<', '>', '>'},
7     /*id*/ {'>', '>', '<', '<', '>', '>'},
8     /**/ {'<', '<', '<', '<', '='},
9     /**/ {'>', '>', '<', '<', '>', '>'},
10    /*$/*/ {'<', '<', '<', '<', '=', '='}
11 };
12 char symbols[] = "+*id()$";
13
14 int getIndex(char c) {
15     for(int i = 0; i < 6; i++)
16         if(symbols[i] == c)
17             return i;
18     return -1;
19 }
20
21 int main() {
22     char input[50], stack[50] = "$";
23     int i = 0, top = 1;
24
25     printf("Grammar: E ? E+E | E*E | (E) | id\n");
26     printf("Operator Precedence Parsing\n");
27 }
```

Compilation results...

- Errors: 0
- Warnings: 0
- Output Filename: C:\Users\Haritha\OneDrive\Documents\EXP_3.exe
- Output Size: 129.8466796875 Kib
- Compilation Time: 0.66s

OUTPUT:

The terminal window displays the program's output. It starts with the grammar definition and the title "Operator Precedence Parsing". It prompts the user to enter an input string ending with a dollar sign. The input provided is "id+id*id\$". The program then performs a stack-based parse, showing the state of the stack, the input token, and the action taken (SHIFT, REDUCE, or ERROR). The final message indicates an invalid expression.

```
Grammar: E ? E+E | E*E | (E) | id
Operator Precedence Parsing
Enter input string (end with $): id+id*id$

STACK           INPUT          ACTION
-----
$              id+id*id$        SHIFT
$i             d+id*id$        REDUCE
$              d+id*id$        REDUCE
$              d+id*id$        ERROR: Invalid expression

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Process exited after 12.54 seconds with return value 0
Press any key to continue . . .
```