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CS6A

Compiler Design Lab 2 : Lexical Analyzer to identify keywords , identifiers , variables , constants and operators reading from file and string.

```
C lexical.c > analyze(char *)
1  #include <stdio.h>
2  #include <stdlib.h>
3  #include <ctype.h>
4  #include <string.h>
5  char keywords[][10] = {"int", "float", "if", "else", "while", "return", "char"};
6  char operators[] = "#+-*/=<>";
7  int isKeyword(char *word) {
8      for (int i = 0; i < 7; i++)
9          if (strcmp(word, keywords[i]) == 0)
10             return 1;
11     return 0;
12 }
13 int isOperator(char ch) {
14     for (int i = 0; i < strlen(operators); i++)
15         if (ch == operators[i])
16             return 1;
17     return 0;
18 }
19 void analyze(char *code) {
20     char token[5000];
21     int i = 0, j = 0;
22     while (code[i] != '\0') {
23         if (isspace(code[i])) {
24             i++;
25             continue;
26         }
27         if (isalpha(code[i])) {
28             j = 0;
29             while (isalnum(code[i]))
30                 token[j++] = code[i++];
31             token[j] = '\0';
32             if (isKeyword(token))
33                 printf("%s is a keyword\n", token);
34             else
35                 printf("%s is an identifier\n", token);
36         } else if (isdigit(code[i])) {
37             j = 0;
```

```
38             while (isdigit(code[i]))
39                 token[j++] = code[i++];
40             token[j] = '\0';
41             printf("%s is a constant\n", token);
42         } else if (isOperator(code[i])) {
43             printf("%c is an operator\n", code[i]);
44             i++;
45         } else {
46             i++;
47         }
48     }
49 }
50 void readFromFile(char *filename) {
51     FILE *file = fopen(filename, "r");
52     if (!file) {
53         printf("File not found\n");
54         return;
55     }
56     char code[100000];
57     fread(code, sizeof(char), 1000, file);
58     fclose(file);
59     analyze(code);
60 }
61 int main() {
62     char choice, code[1000], filename[100];
63     printf("file : f and String : s");
64     scanf(" %c", &choice);
65     getchar();
66     if (choice == 'f') {
67         printf("Enter filename: ");
68         scanf("%s", filename);
69         readFromFile(filename);
70     } else if (choice == 's') {
71         printf("Enter code: ");
72         fgets(code, 1000, stdin);
```

```
73     analyze(code);
74 }
75 else{
76     printf("enter the valid choice");
77 }
78 return 0;}
79
```

≡ aadi.txt

```
1  #include <stdio.h>
2
3  int main() {
4      int a = 10;
5      float b = 20.5;
6      char c = 'A';
7
8      a = a + b;
9
10     if (a > b) {
11         a = a - 5;
12     } else {
13         b = b * 2;
14     }
15
16     return 0;
17 }
18
```

Output

```
C:\Users\veert\OneDrive\Desktop\new>lexical.exe
file : f and String : sf
Enter filename: aadi.txt
# is an operator
include is an identifier
< is an operator
stdio is an identifier
h is an identifier
> is an operator
int is a keyword
main is an identifier
int is a keyword
a is an identifier
= is an operator
10 is a constant
; is an operator
float is a keyword
b is an identifier
= is an operator
20 is a constant
5 is a constant
; is an operator
char is a keyword
c is an identifier
= is an operator
A is an identifier
; is an operator
a is an identifier
= is an operator
a is an identifier
+ is an operator
b is an identifier
; is an operator
if is a keyword
a is an identifier
> is an operator
b is an identifier
a is an identifier
= is an operator
a is an identifier
- is an operator
5 is a constant
```