EXP NO: 2 **DATE:**

DEVELOP A C PROGRAM TO ANALYZE A GIVEN C CODE SNIPPET AND RECOGNIZE DIFFERENT TOKENS, INCLUDING KEYWORD, IDENTIFIERS, OPERAT OR AND SPECIAL SYMBOLS

AIM:
To develop a C program that analyzes a given C code snippet and recognizes different tokens, including keywords, identifiers, operators, and special symbols.

ALGORITHM:

1. Start
2. Take a C code snippet as input from the user or a file.
3. Initialize necessary arrays and variables for keywords, identifiers, operators, and special
4. symbols.
5. Tokenize the input string using spaces, newlines, and other delimiters.
6. For each token:
   - Check if it is a keyword (compare with a predefined list of C keywords).
   - Check if it is an identifier (valid variable/function name that doesn't match a
   - keyword).
   - Check if it is an operator (e.g., +, -, *, /, ==, &&).
   - Check if it is a special symbol (e.g., {, }, (,), ;, ,).
7. Print the categorized tokens.
8. End

PROGRAM:
```
#include <stdio.h>
#include <string.h>
#include <ctype.h>
// List of C keywords
const char *keywords[] = {
"int", "float", "char", "double", "if", "else", "for", "while",
"do", "return", "void", "switch", "case", "break", "continue",
"default", "struct", "typedef", "enum", "union", "static",
"extern", "const", "sizeof", "goto", "volatile", "register"
};
const int num_keywords = sizeof(keywords) / sizeof(keywords[0]);
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// List of C operators
const char *operators[] = {"+", "-", "*", "/", "=", "==", "!=", "<", ">", "<=", ">=", "&&", "||",
"++", "--"};
const int num_operators = sizeof(operators) / sizeof(operators[0]);
// List of special symbols
const char special_symbols[] = {';', '(', ')', '{', '}', '[', ']', ',', '#', '&', '|', ':', '"', '\''};
```

```
// Function to check if a word is a keyword
int isKeyword(char *word) {
for (int i = 0; i < num_keywords; i++) {
if (strcmp(word, keywords[i]) == 0)
return 1;
}
return 0;
}
// Function to check if a character is an operator
int isOperator(char *word) {
for (int i = 0; i < num_operators; i++) {
if (strcmp(word, operators[i]) == 0)
return 1;
}
return 0;
}
// Function to check if a character is a special symbol
int isSpecialSymbol(char ch) {
for (int i = 0; i < sizeof(special_symbols); i++) {
if (ch == special_symbols[i])
return 1;
}
return 0;
}
// Function to classify tokens
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void analyzeTokens(char *code) {
char *token = strtok(code, " \t\n"); // Tokenizing by spaces, tabs, and newlines
printf("\nRecognized Tokens:\n");
while (token != NULL) {
if (isKeyword(token))
printf("Keyword: %s\n", token);
else if (isOperator(token))
printf("Operator: %s\n", token);
else if (isalpha(token[0]) || token[0] == '_') // Identifiers start with a letter or underscore
printf("Identifier: %s\n", token);
else if (isSpecialSymbol(token[0]))
printf("Special Symbol: %s\n", token);
else
printf("Unknown Token: %s\n", token);
token = strtok(NULL, " \t\n");
}
}
// Main function
int main() {
char code[500];
printf("Enter a C code snippet:\n");
fgets(code, sizeof(code), stdin);
analyzeTokens(code);
return 0;
}
```
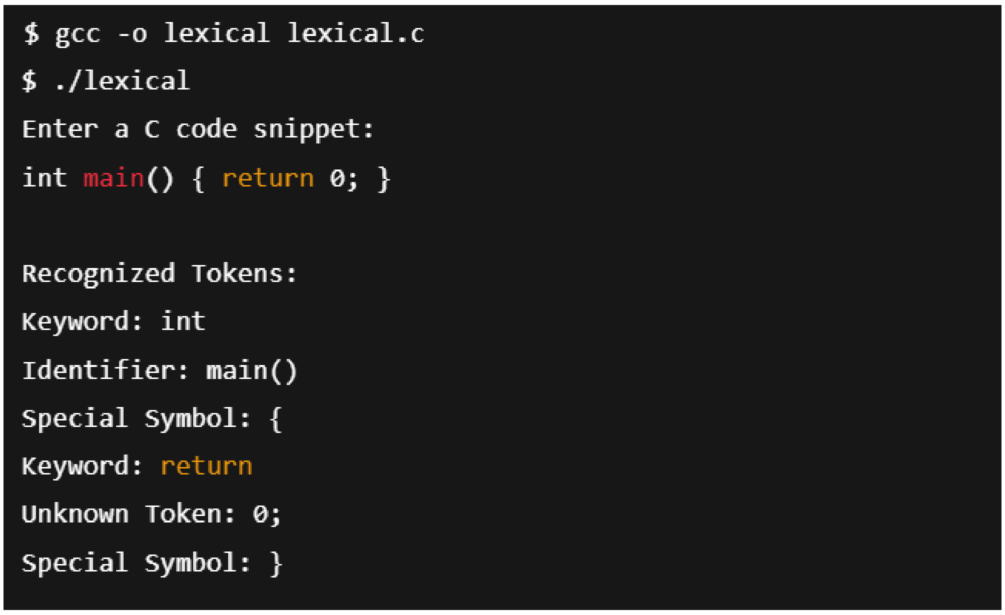

OUTPUT:



```
$ gcc -o lexical lexical.c
$ ./lexical
Enter a C code snippet:
int main() { return 0; }

Recognized Tokens:
Keyword: int
Identifier: main()
Special Symbol: {
Keyword: return
Unknown Token: 0;
Special Symbol: }
```

RESULT:

Thus, the above program reads a C code snippet, tokenizes it using space, tab, and newline as delimiters, classifies each token as a keyword, identifier, operator, or special symbol based on predefined lists, and prints the recognized tokens along with their types.