Premier University Chittagong

Course Title	:	Compiler Construction Laboratory
Course Code	:	CSE 454
Department	:	Computer Science and Engineering
Report No	:	01
Report Name	:	Write a c program to count total number of keyword and identifier.
Date	:	09/08/2020

Marks

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Objective: Write a c program to count total number of keyword and identifier.

Equipments: 1. ASUS k43u Laptop

2. 2 GB Ram and 512 GB hard disk.

3. CodeBlocks

4. GNU GCC compiler

Source Code:

```
#include <stdbool.h>

#include <stdio.h>

#include <string.h>

#include <stdlib.h>

#define MAXCHAR 1000


int keyword = 0, identifier = 0;


bool isDelimiter(char ch)

{

	if (ch == ' ' || ch == '+' || ch == '-' || ch == '*' ||

		ch == '/' || ch == ',' || ch == ';' || ch == '>' ||

		ch == '<' || ch == '=' || ch == '(' || ch == ')' ||

		ch == '[' || ch == ']' || ch == '{' || ch == '}')

		return (true);

	return (false);

}


bool validIdentifier(char* str)
```

```
{
	if (str[0] == '0' || str[0] == '1' || str[0] == '2' ||
		str[0] == '3' || str[0] == '4' || str[0] == '5' ||
		str[0] == '6' || str[0] == '7' || str[0] == '8' ||
		str[0] == '9' || isDelimiter(str[0]) == true)
		return (false);
	return (true);
}

bool isKeyword(char* str)
{
	if (!strcmp(str, "if") || !strcmp(str, "else") ||
		!strcmp(str, "while") || !strcmp(str, "do") ||
		!strcmp(str, "break") ||
		!strcmp(str, "continue") || !strcmp(str, "int")
		|| !strcmp(str, "double") || !strcmp(str, "float")
		|| !strcmp(str, "return") || !strcmp(str, "char")
		|| !strcmp(str, "case") || !strcmp(str, "char")
		|| !strcmp(str, "sizeof") || !strcmp(str, "long")
		|| !strcmp(str, "short") || !strcmp(str, "typedef")
		|| !strcmp(str, "switch") || !strcmp(str, "unsigned")
		|| !strcmp(str, "void") || !strcmp(str, "static")
		|| !strcmp(str, "struct") || !strcmp(str, "goto"))
		return (true);
	return (false);
```

```
}

char* subString(char* str, int left, int right)
{
        int i;
        char* subStr = (char*)malloc(
                                sizeof(char) * (right - left + 2));

        for (i = left; i <= right; i++)
                subStr[i - left] = str[i];
        subStr[right - left + 1] = '\0';
        return (subStr);
}

void parse(char* str)
{
        int left = 0, right = 0;
        int len = strlen(str);

        while (right <= len && left <= right) {
                if (isDelimiter(str[right]) == false)
                        right++;

                if (isDelimiter(str[right]) == true && left == right) {
```

```
                right++;
                left = right;
            } else if (isDelimiter(str[right]) == true && left != right
                    || (right == len && left != right)) {
                char* subStr = subString(str, left, right - 1);

                if (isKeyword(subStr) == true)
                    keyword++;

                else if (validIdentifier(subStr) == true
                        && isDelimiter(str[right - 1]) == false)
                    identifier++;

                left = right;
            }
        }
        return;
}

int main()
{
FILE *fp;
   char str[MAXCHAR];
   char* filename = "test.txt";
```

```
    fp = fopen(filename, "r");
    if (fp == NULL){
        printf("Could not open file %s",filename);
        return 1;
    }
    while (fgets(str, MAXCHAR, fp) != NULL)
        parse(str);
    fclose(fp);


            printf("Total Keyword : %d\n",keyword);
            printf("Total Identifier : %d\n",identifier);
            return (0);
}
```

Input:

In test.txt file

```
#include <stdio.h>
int main()
{
    long long num;
    int count = 0;
    printf("Enter any number: ");
    scanf("%lld", &num);
    do
    {
        count++;
```

```
        num /= 10;
    } while (num != 0);
    printf("Total digits: %d", count);
    return 0;
}
```

Output:

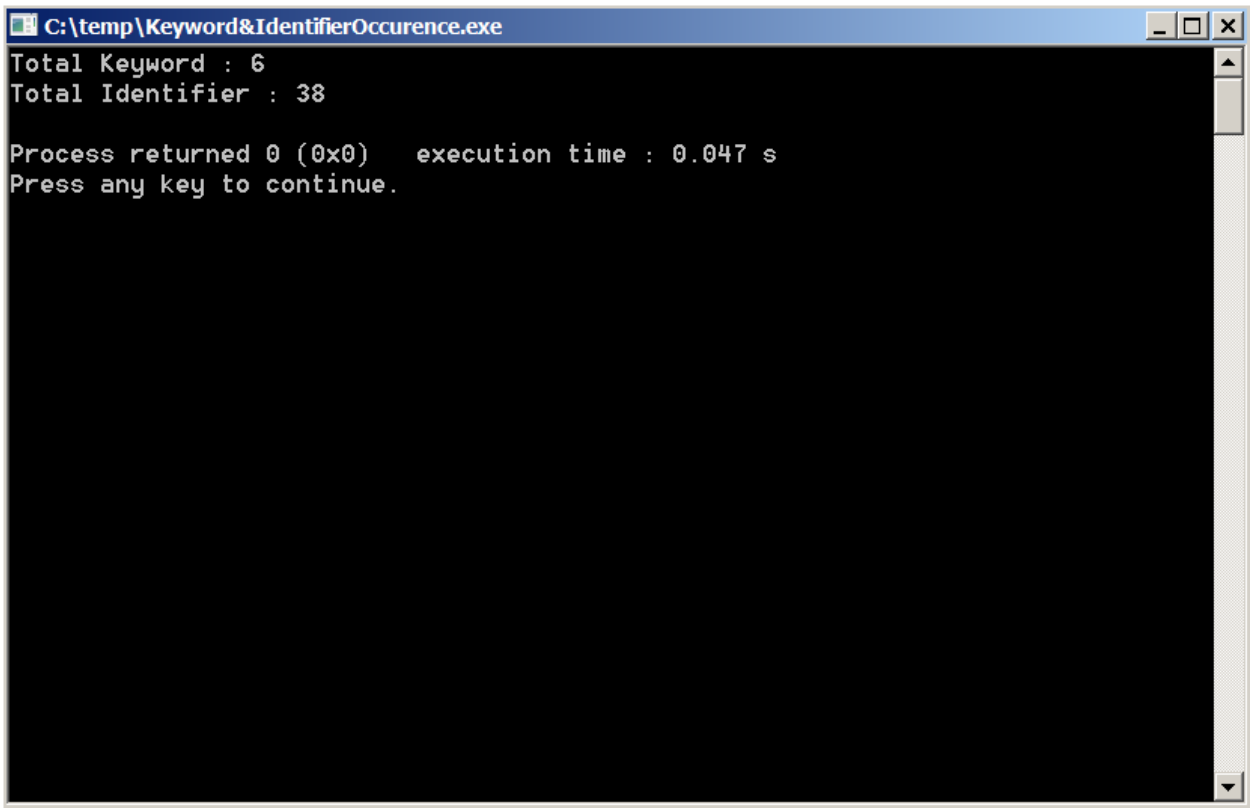

Fig: Output of the total number of identifier and keyword

Discussion: Basically keywords are auto, break, case, char, const, continue, default, do, double, else, enum, exturn, float, for, goto, if, int, long, register, return, short, signed, sizeof, static, struct, switch, typedef, union, unsigned, void, volatile, while.

And the identifiers are names for entities in a C program, such as variables, arrays, functions, structures, unions and labels. An identifier can be composed only of uppercase, lowercase letters, underscore and digits, but should start only with an alphabet or an underscore

First of all I created a text file with code. Then I have declared the code to read the text files code, then I have coded to find the total number of identifier and keyword of this code.