Problem Statement 1: Write a C Program to scan and count the number of characters, words, and lines in a given text file.

Input : Input will be a text file named - hello.txt.

Output expected : Count of characters, words and lines in the given text file.

Description of problem statement : We have to write a program to print the number of characters, words and lines in a text file which have some content in it. The file name is given as input by user.

Algorithm :

Step 1: Start

Step 2: Open source file in read " r " mode.

Step 3: Initialize three variables ch=0,w=0,l=0 for character, word and line count .

Step 4: Read a character from file and store it in a variable c.

Step 5: Increment count of a variable ch which will keep number of characters.

Step 5.1: Increment w for word count if current character is whitespace character

i.e. if(c==' ' || c=='\t' || c=='\n' || c=='\0').

Step 5.2: Increment l for line count if current character is new line character

i.e. if ((c=='\n'|| c=='\0')).

Step 5.3: Decrement ch if current character is space or newline i.e. if(c==' ' || c=='\n'

|| c=='\0').

Step 6: Repeat steps 4 and 5 till end of file has reached.

Step 7: After reaching end of file, increment w and l count by one.

Step 8: Print count of characters,words and lines.

Step 9: Close the file.

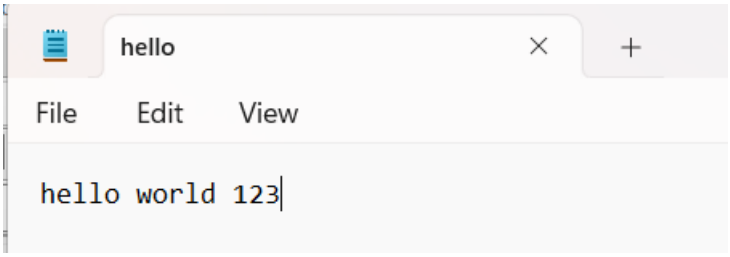
Step 10: Stop

CODE:

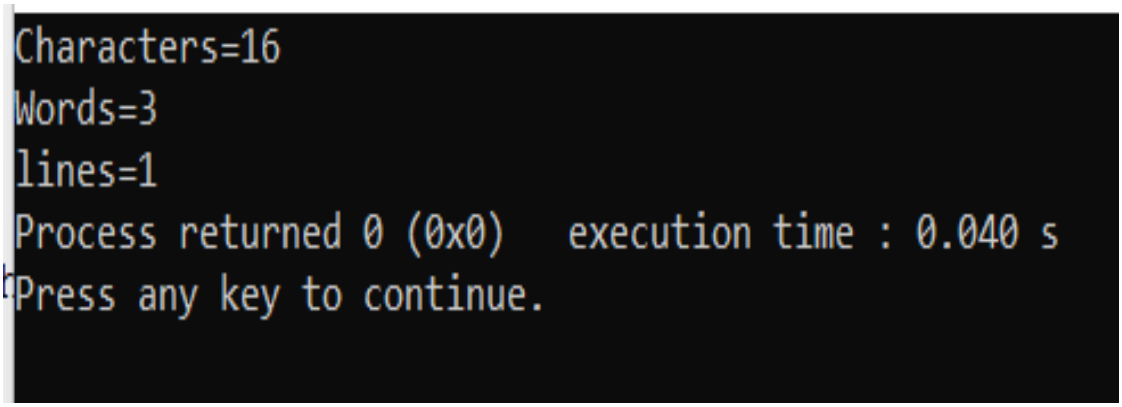
```
#include <stdio.h>
#include <stdlib.h>
int main() {
  FILE *f;
  char ch;
  int cha, wo, li;
  f = fopen("a.txt", "r");
  if (f == NULL) {
    printf("File not found");
  }
  cha = wo = li = 0;
  while (ch != EOF) {
    ch = fgetc(f);
    cha++;
    if (ch == ' ' || ch == '\0' || ch == '\t' || ch == '\n') {
      wo++;
    }
    if (ch == '\n' || ch == '\0') {
      li++;
    }
  }
  if (cha > 0) {
    wo++;
    li++;
  }
  printf("Characters=%d\nWords=%d\nlines=%d", cha, wo, li);
  fclose(f);
  return 0;
}
```

OUTPUT:

File- hello.txt



Output :-



Problem Statement 2: Write a C program to scan and count the number of uppercase characters, lowercase characters , digits and special characters in a given text file .

Input : Input will be a text file named - hello.txt.

Output expected : Count of uppercase characters, lowercase characters ,digits and special characters in the given text file.

Description of problem statement : We have to write a program to print the number of uppercase characters, lowercase characters, digits and special characters in a text file which have some content in it. The file name is given as input by user.

Algorithm :

Step 1: Start

Step 2: Open source file in read " r " mode.

Step 3: Initialize three variables up=0,lw=0,dg=0,sp=0 for uppercase characters, lowercase characters, digits and special characters count.

Step 4: Read a character from file and store it in a variable ch .

Step 4.1: Increment up for uppercase count if current character is in uppercase i.e.

if(ch>='A ' && ch<='Z).

Step 4.2: Increment lw for lowercase if current character is in lowercase i.e.

if ((ch>='a' && ch<='z')).

Step 4.3: Increment dg for digit if current character is a digit i.e.

if(ch>='0 ' && ch<='9').

Step 4.4: Increment sp for special character if current character is special character

i.e. if(ch!=' ' && ch!='\n')

Step 5: Repeat step 4 until end of file has reached.

Step 7: Print count of uppercase characters, lowercase characters, digits and special characters .

Step 8: Close the file.

Step 9: Stop

CODE :

```
#include <stdio.h>
#include <stdlib.h>
int main() {
  FILE *f;
  char ch;
  int sp, up, lo, di;
  f = fopen("hello.txt", "r");
  if (f == NULL) {
    printf("File not found");
  }
  sp = up = lo = di = 0;
  while (ch != EOF) {
    ch = fgetc(f);
    if (ch >= 'A' && ch <= 'Z') {
      up++;
    } else if (ch >= 'a' && ch <= 'z') {
      lo++;
    } else if (ch >= '0' && ch <= '9') {
      di++;
    } else {
      sp++;
    }
  }
  printf("Special Characters=%d\nUpper Case=%d\nLower Case=%d\nDigit=%d", sp,
        up, lo, di);
  fclose(f);
  return 0;
}
```

OUTPUT

Text file - hello.txt