Exp. No. 17
Write a C program for implementing a Lexical Analyzer to Scan and Count the number of characters, words, and lines in a file.
Program:

```
#include <stdio.h>

int main() {
   char str[100]; // Input string with size 100
   int words = 0, newline = 0, characters = 0; // Counter variables
   int i = 0;

   printf("Enter text (end input with '~'):\n");
   scanf("%[^~]", str); // Read input until '~'

   // Check for empty input
   if (str[0] == '\0') {
      printf("Total number of words : 0\n");
      printf("Total number of lines : 0\n");
      printf("Total number of characters : 0\n");
      return 0;
   }

   // Process the input string
   for (i = 0; str[i] != '\0'; i++) {
      if (str[i] == ' ') {
         // Count words only if the previous character was not a space or
newline
         if (i > 0 && str[i - 1] != ' ' && str[i - 1] != '\n') {
            words++;
         }
      } else if (str[i] == '\n') {
         newline++;
         // If the previous character was not a space or newline, count as
a new word
         if (i > 0 && str[i - 1] != ' ' && str[i - 1] != '\n') {
            words++;
         }
      } else {
         characters++;
      }
```

```
    }

    // If the last character is not a space or newline, count the last word
    if (i > 0 && str[i - 1] != ' ' && str[i - 1] != '\n') {
        words++;
    }

    // Ensure we count at least one line if there is input
    if (i > 0) {
        newline++;
    }

    // Print results
    printf("Total number of words : %d\n", words);
    printf("Total number of lines : %d\n", newline);
    printf("Total number of characters : %d\n", characters);

    return 0;
}
```