LAB EXPERIMENT 4 QUESTION

4.Design a lexical Analyzer to find the number of whitespaces and newline characters.

**Aim:**

To design a **Lexical Analyzer** that scans a given source code file and counts the number of **whitespace characters** (spaces, tabs) and **newline characters** (\n).

**Procedure:**

1. **Read the Input File**
   * Open the source code file in **read mode** (r).
2. **Scan Each Character**
   * Read each character **one by one** from the file.
3. **Count Whitespace and Newlines**
   * If the character is a **space (' ') or tab ('\t')**, increase the whitespace count.
   * If the character is a **newline ('\n')**, increase the newline count.
4. **Display Results**
   * After scanning the file, print the total count of **whitespaces** and **newlines**.

**C Program Implementation**

This program reads input.c, counts spaces, tabs, and newlines, and displays the result.

c

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#include <stdio.h>

#include <stdlib.h>

void countWhitespaceAndNewlines(FILE \*fp) {

char ch;

int whitespaceCount = 0, newlineCount = 0;

while ((ch = fgetc(fp)) != EOF) {

if (ch == ' ' || ch == '\t') {

whitespaceCount++; // Count spaces and tabs

}

if (ch == '\n') {

newlineCount++; // Count newlines

}

}

printf("Total Whitespaces (spaces & tabs): %d\n", whitespaceCount);

printf("Total Newline Characters: %d\n", newlineCount);

}

int main() {

FILE \*fp = fopen("input.c", "r"); // Open the file for reading

if (!fp) {

printf("Error opening file!\n");

return 1;

}

countWhitespaceAndNewlines(fp);

fclose(fp); // Close the file

return 0;

}

Output:

A black background with pink and white text

Description automatically generated