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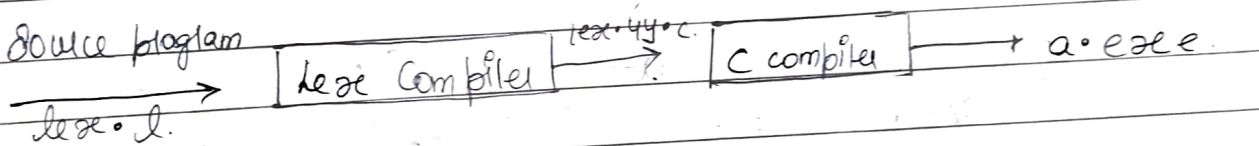
SPCC - Lab.

Aim: Implement lexical analyzer using FLEX
a) Count no. of vowels & consonants
b) Count no. of words, characters & lines
c) Count no. of keywords, identifiers & operators
d) Identify even & odd integers
e) Count of printf & scanf in C
f) Classify english words as verbs, adverbs, adjectives

Theory:- Lex is a program that generates lexical analyzer its used with YACC parser.
- It is a program that transforms an input stream into a sequence of tokens

Steps are as follows in form of diagram



Block Diagram for Lex

* Lex program is separated into 3 sections by %% delimeters. The format of lex source is given as example below.

To count no. of words

```
%. {
   # include <stdio.h>
   # include <conio.h>
     int i = 0;
   %} %
/* Rules */
%%
([a-zA-Z0-9])*  {i++;}  →action
```

```
"\n" { printf ("%d \n", i); i=0; }
%%

int yywrap (void) { }
int main()
{
  yylex();

  return 0;
}
```

Regular Expression in lex:

1) operators : " \ { } [ ] ^ $ < > ? . * + | ( ) /
2) digits : [0-9]
3) character class : [a-zA-Z], [^abc] ⇒ not abc
4) Optional Expressions : ? is optional element.
   ab?c ⇒ either ac or abc.
5) Repeated Expressions : Repetitions are indicated by * & +
   eg) a* : any number of a's
   [a-z]+ : positive number of consecutive lower-case alphabetic character
   a{1,5} : One to five repetitions of a.

lex predefined variables.

1) int yylex(void) : call to invoke lexer.
2) char * yytext : pointer to matched string.
3) yyleng : length of matched string

4) yylval : value associated with token.
5) int yywrap(void) : wrapup, return 1 if done, 0 if not done.
6) FILE *yyout : o/p file.
7) FILE *yyin : i/p file.
8) ECHO : write matched string.

Steps for solving & executing lex programs.

1) Write lex program & save it with '.l' extension.

2) Go to directory where filename.l is using cd.

3) Type flex filename.l command to get 'c' file that is named as lex.yy.c.

4) To run this, first compile it with C compiler using

gcc lex.yy.c -o filename.exe.

5) Now the program is commuted to executable format run it using command.

filename.exe.

Conclusion : I have successfully studied FLEX tool & implemented it.