SRES's Sanjivani College of Engineering, Kopargaon
(*An Autonomous Institute*)
Department of Computer Engineering

SPOS Lab Manual

Assignment No. 06

AIM:
Write a program using Lex specifications to implement lexical analysis phase of compiler to count no. of words, lines and characters of given input file.

PROBLEM DEFINITION:
Write a program using Lex specifications to implement lexical analysis phase of compiler to count no. of words, lines and characters of given input file.

OBJECTIVES:
1. To understand lexical analyzer
2. To use the lex tool

INPUT:
Sample text file

OUTPUT:
Count of words, lines and characters from the text file

THEORY:

The yyvariables

The following variables are offered by LEX to aid the programmer in designing sophisticated lexical analyzers. These variables are accessible in the LEX program and are automatically declared by LEX in *lex.yy.c*.

yyin

yyin is a variable of the type FILE* and points to the input file. *yyin* is defined by LEX automatically. If the programmer assigns an input file to *yyin* in the auxiliary functions section, then *yyin* is set to point to that file. Otherwise LEX assigns *yyin* to stdin(console input).

yytext

yytext is of type *char** and it contains the *lexeme* currently found. A **lexeme** is a sequence of characters in the input stream that matches some pattern in the Rules Section. (In fact, it is the first matching sequence in the input from the position pointed to by *yyin*.) Each invocation of the function *yylex()* results in *yytext* carrying a pointer to the lexeme found in the input stream by *yylex()*. The value of yytext will be overwritten after the next *yylex()* invocation.

yyleng

yyleng is a variable of the type int and it stores the length of the lexeme pointed to by *yytext*.

The yyfunctions

- yylex()
- yywrap()

yylex()

yylex() is a function of return type int. LEX automatically defines *yylex()* in *lex.yy.c* but does not call it. The programmer must call yylex() in the Auxiliary functions section of the LEX program. LEX generates code for the definition of yylex() according to the rules specified in the Rules section.

NOTE: That yylex() need not necessarily be invoked in the Auxiliary Functions Section of LEX program when used with YACC.

4.2 yywrap()

LEX declares the function yywrap() of return-type int in the file *lex.yy.c* . LEX does not provide any definition for yywrap(). yylex() makes a call to yywrap() when it encounters the end of input. If yywrap() returns zero (indicating *false*) yylex() assumes there is more input and it continues scanning from the location pointed to by yyin. If yywrap() returns a non-zero value (indicating true), yylex() terminates the scanning process and returns 0 (i.e. “wraps up”). If the programmer wishes to scan more than one input file using the generated lexical analyzer, it can be simply done by setting yyin to a new input file in yywrap() and return 0.

As LEX does not define yywrap() in lex.yy.c file but makes a call to it under yylex(), the programmer must define it in the Auxiliary functions section or provide %option noyywrap in the declarations section. This options removes the call to yywrap() in the lex.yy.c file. Note that, it is **mandatory** to either define yywrap() or indicate the absence using the %option feature. If not, LEX will flag an error

ALGORITHM:

1. Write the lex program having .l extension

2. compile lex program to generate lex.yy.c programming

3. Compile c program to generate the object program a.out

4. a.out is the generated lexical analyzer

5. Provide the input text file to lexical analyzer to generate the output

Sample Input File:

Nilesh Pardeshi

1982

SRES COE

Output:

Words = 5

Lines = 3

Chars = 30

OBSERVATION:

It is observed that no. of words, lines and characters from the input file are get displayed on the screen

CONCLUSION:

LEX tool is used to count no. of words, lines and characters for the given input file

References:

Lex & Yacc Book by Doug Brown, John R. Levine, and Tony Mason

Prepared by
Prof.N.G.Pardeshi
Subject Teacher

Approved by
Dr. D.B.Kshirsagar
HOD