**Aim (E1):**

**Design a lexical analyzer to identify the tokens such as keywords, identifiers, operators,**

**constants (Int, float & character), special symbols and strings for C language using LEX. Use File for the input.**

**Program:**

%{

#include<stdio.h>

%}

keyword include|void|main|int|float|char|double|if|else|switch|case|for|while|do

operators ==|!=|>=|<=|[\>\<\+\-\\*\/\=]

identifiers [a-zA-Z0-9]

%%

\n printf("Line Break\n");

\t printf("Tab Space\n");

" " printf("A whitespace\n");

{keyword} printf("%s is a keyword\n",yytext);

[a-zA-Z]{identifiers}\* printf("%s is an identifier\n",yytext);

{operators} printf("%s is an operator\n",yytext);

[0-9]+ printf("%s is digit(s)\n",yytext);

. printf("%s is a special character\n",yytext);

%%

int main()

{

yyin = fopen("myfirstc.txt

","r");

yylex();

}

int yywrap()

{

return (1);

}

**myfirstc.txt**

#include<stdio.h>

void main()

{

int i=0;

float j=0;

for(i=0; i<=20; i++)

{

if(i==n)

printf("hgjfhdjghdf");

}

}

**Output:**

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1>flex p1e1[1].l

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >gcc lex.yy.c

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >a.exe

# is a special character

include is a keyword

< is an operator

stdio is an identifier

. is a special character

h is an identifier

> is an operator

Line Break

Line Break

void is a keyword

A whitespace

main is a keyword

( is a special character

) is a special character

Line Break

{ is a special character

Line Break

Tab Space

int is a keyword

A whitespace

i is an identifier

= is an operator

0 is digit(s)

; is a special character

Line Break

Tab Space

float is a keyword

A whitespace

j is an identifier

= is an operator

0 is digit(s)

; is a special character

Line Break

Tab Space

for is a keyword

( is a special character

i is an identifier

= is an operator

0 is digit(s)

; is a special character

A whitespace

i is an identifier

<= is an operator

20 is digit(s)

; is a special character

A whitespace

i is an identifier

+ is an operator

+ is an operator

) is a special character

Line Break

Tab Space

{ is a special character

Line Break

Tab Space

Tab Space

if is a keyword

( is a special character

i is an identifier

== is an operator

n is an identifier

) is a special character

Line Break

Tab Space

Tab Space

printf is an identifier

( is a special character

" is a special character

hgjfhdjghdf is an identifier

" is a special character

) is a special character

; is a special character

Line Break

Tab Space

} is a special character

Line Break

} is a special character

**Aim (E2):**

**Write a Lex program to find the parameters given below. Consider as input a question paper of an examination and find:**

**Date of examination, semester, number of questions, numbers of words, lines, small letters,**

**capital letters, digits, and special characters.**

**Program:**

%{

#include<stdio.h>

int q=0;

int w=0;

int l=0;

int sl=0;

int cl=0;

int d=0;

int sp=0;

%}

day ([1-3][0-9])|[1-9]

month (1[0-2])|[1-9]

year [0-9]+

%%

{day}\/{month}\/{year} {printf("Date of Exam: %s\n",yytext);}

I|II|III|IV|V|VI|VII|VIII {printf("Sem: %s\n",yytext);}

Question[1-9][0-9]\* {q++;cl++;d++;}

[a-z] {sl++;}

[A-Z] {cl++;}

[0-9] {d++;}

\n {l++;w++;}

" " {w++;}

. {sp++;}

%%

void main()

{

yyin = fopen("qp.txt","r");

yylex();

printf("Questions: %d\n",q);

printf("Word: %d\n",w);

printf("Lines: %d\n",l);

printf("Small: %d\n",sl);

printf("Caps: %d\n",cl);

printf("Digit: %d\n",d);

printf("Special Character: %d\n",sp);

}

int yywrap()

{

return(1);

}

**qp.txt**

ABC College

1/1/2000 Sem: III

Question1 : What are the benefits of tree plantation?

Question2 : What is water pollution?

Question3 : What should be done to avoid road accidents?

Question4 : What are your view on noise pollution?

Question5 : Why should people adopt pets?

Question6 : What is green gym?

Question7 : What norms must pe implemented to minimize the loss from construction to environment?

Question8 : What is air pollution?

**Output:**

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >flex p1e1[1].l

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >gcc lex.yy.c

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >a.exe

Date of Exam: 1/1/2000

Sem: III

Questions: 8

Word: 74

Lines: 11

Small: 249

Caps: 21

Digit: 8

Special Character: 17

**Aim (E3):**

**Create a txt file to containing the following without heading: Name of Student, Company**

**Placed in (TCS, Infosys, Wipro, Accenture, Informatica), Male/female, CGPA (floating point number), Department (CSE, IT, EC), Package (floating point number), mail id, mobile number (integer exactly 10 digits). At least 10 records must be present.**

**Write a Lex program to find the parameters given below:**

**o Identify Name of student and display it.**

**o Identify CGPA and display (should be less than 10)**

**o Identify Package and display it**

**o Identify mail id and display**

**o Identify mobile number and display**

**o Find number of students placed in each of the company**

**o Number of female students**

**o Number of male students**

**o Number of CSE, IT and EC students who are placed**

**Program:**

%{

#include<stdio.h>

int tcs=0;

int infosys=0;

int wipro=0;

int acc=0;

int info=0;

int m=0;

int f=0;

int cs=0;

int it=0;

int ec=0;

%}

%%

Female {f++;}

Male {m++;}

TCS {tcs++;}

Infosys {infosys++;}

Wipro {wipro++;}

Accenture {acc++;}

Informatica {info++;}

CSE {cs++;}

IT {it++;}

EC {ec++;}

[A-Z][a-z]\* {printf("Name: %s\n",yytext);}

10\.0|[0-9]\.[0-9] {printf("CGPA: %s\n",yytext);}

[0-9][0-9][0-9][0-9][0-9][0-9][0-9][0-9][0-9][0-9] {printf("Mobile: %s\n",yytext);}

[0-9]+ {printf("Package: %s\n",yytext);}

[a-z]+\@[a-z]+\.[a-z]+ {printf("Email: %s\n",yytext);}

%%

void main()

{

yyin = fopen("compdetails.txt","r");

yylex();

printf("TCS: %d\n",tcs);

printf("Infosys: %d\n",infosys);

printf("Wipro: %d\n",wipro);

printf("Accenture: %d\n",acc);

printf("Informatica: %d\n",info);

printf("Male: %d\n",m);

printf("Female: %d\n",f);

printf("CSE: %d\n",cs);

printf("IT: %d\n",it);

printf("EC: %d\n",ec);

}

int yywrap()

{

return(1);

}

**compdetails.txt**

Abc TCS Female 9.4 CSE 600000 abc@rknec.edu 9999999999

Xyz Infosys Male 8.9 IT 550000 xyz@example.com 8888888888

Def Wipro Male 9.2 EC 620000 def@university.edu 7777777777

Mno Accenture Female 8.5 CSE 580000 mno@company.com 6666666666

Pqr Informatica Male 9.7 IT 650000 pqr@school.edu 5555555555

Ghi TCS Female 8.1 EC 530000 ghi@college.edu 4444444444

Jkl Infosys Male 9.0 CSE 590000 jkl@institute.com 3333333333

Rst Wipro Female 9.3 IT 630000 rst@domain.com 2222222222

Wxy Accenture Male 8.7 CSE 570000 wxy@school.edu 1111111111

Nop Informatica Female 9.6 EC 640000 nop@example.com 0000000000

**Output:**

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >flex p1e3.l

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >gcc lex.yy.c

C:\Users\silvi\Desktop\Try\College\6th\_sem\CD\_lab\prac1 >a.exe

Name: Abc

CGPA: 9.4

Package: 600000

Email: abc@rknec.edu

Mobile: 9999999999

Name: Xyz

CGPA: 8.9

Package: 550000

Email: xyz@example.com

Mobile: 8888888888

Name: Def

CGPA: 9.2

Package: 620000

Email: def@university.edu

Mobile: 7777777777

Name: Mno

CGPA: 8.5

Package: 580000

Email: mno@company.com

Mobile: 6666666666

Name: Pqr

CGPA: 9.7

Package: 650000

Email: pqr@school.edu

Mobile: 5555555555

Name: Ghi

CGPA: 8.1

Package: 530000

Email: ghi@college.edu

Mobile: 4444444444

Name: Jkl

CGPA: 9.0

Package: 590000

Email: jkl@institute.com

Mobile: 3333333333

Name: Rst

CGPA: 9.3

Package: 630000

Email: rst@domain.com

Mobile: 2222222222

Name: Wxy

CGPA: 8.7

Package: 570000

Email: wxy@school.edu

Mobile: 1111111111

Name: Nop

CGPA: 9.6

Package: 640000

Email: nop@example.com

Mobile: 0000000000

TCS: 2

Infosys: 2

Wipro: 2

Accenture: 2

Informatica: 2

Male: 5

Female: 5

CSE: 4

IT: 3

EC: 3

**Aim (E4):**

**Write a Lex Program which takes C program from file & write the sane C program in**

**another file after removing the comments.**

**Program:**

%{

#include<stdio.h>

%}

%%

(\/\/.\*\n)|\/\\*.\*\/\\* ;

[\n] {fprintf(yyout,"\n");}

. {fprintf(yyout,"%s",yytext);}

%%

void main()

{

yyin = fopen("comment.txt","r");

yyout = fopen("nocomment.txt","w");

yylex();

}

int yywrap()

{

return(1);

}

**comment.txt**

#include <stdio.h>

// Function to calculate the factorial of a number recursively

int factorial(int n) {

// Base case: factorial of 0 is 1

if (n == 0)

return 1;

// Recursive case: factorial of n is n multiplied by factorial of (n-1)

else

return n \* factorial(n - 1);

}

int main() {

// Declare a variable to store the number

int num;

// Prompt the user to enter a number

printf("Enter a non-negative integer: ");

scanf("%d", &num);

// Check if the number is negative

if (num < 0) {

printf("Error: Factorial is not defined for negative numbers.\n");

} else {

// Calculate the factorial and display the result

int result = factorial(num);

printf("Factorial of %d is %d\n", num, result);

}

// End of the program

return 0;

}

**Output:**

**nocomment.txt**

#include <stdio.h>

int factorial(int n) {

if (n == 0)

return 1;

else

return n \* factorial(n - 1);

}

int main() {

int num;

printf("Enter a non-negative integer: ");

scanf("%d", &num);

if (num < 0) {

printf("Error: Factorial is not defined for negative numbers.\n");

} else {

int result = factorial(num);

printf("Factorial of %d is %d\n", num, result);

}

return 0;

}