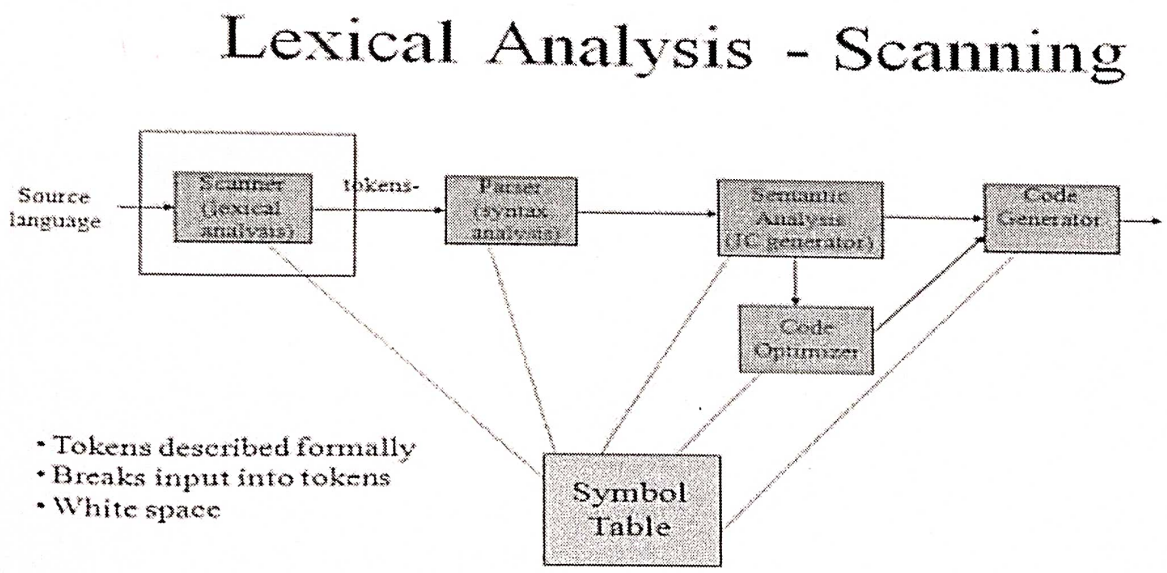
EXPERIMENT NO: 02

Title: Design a complete lexical analyzer for C language
Aim: Design a complete lexical analyzer for C language

Theory:

Lexical analysis is the process of converting a sequence of characters (such as in a computer program of web page) into a sequence of tokens (strings with an identified "meaning"). A program that perform lexical analysis may be called a lexer, tokenize or scanner.



TOKEN

A token is a structure representing a lexeme that explicitly indicates its categorization for the Purpose of parsing. A category of token is what in linguistics might be called a part-of- speech. Examples of token categories may include "identifier" and "integer literal", although the set of Token differ in different programming languages. The process of forming tokens from an input stream of characters is called tokenization. Consider this expression in the C programming language: Sum=3 + 2;

Tokenized and represented by the following table:

Lexeme	Token category
Sum	"identifier"
=	"assignment operator"
3	"integer literal"
+	"addition operator"
2	"integer literal"
;	"end of the statement"

ALGORITHM:

1. Start the program
2. Include the header files.
3. Allocate memory for the variable by dynamic memory allocation function.
4. Use the file accessing functions to read the file.
5. Get the input file from the user.
6. Separate all the file contents as tokens and match it with the functions.
7. Define all the keywords in a separate file and name it as key.c
8. Define all the operators in a separate file and name it as open.c
9. Give the input program in a file and name it as input.c
10. Finally print the output after recognizing all the tokens.
11. Stop the program.

Program:

```
#include<stdio.h>
#include<conio.h>
#include<ctype.h>
#include<string.h>
void main()
{
FILE *fi,*fo,*fop,*fk;
int flag=0,i=1;
char c,t,a[15],ch[15],file[20];
clrscr();
printf("\n Enter the File Name:");
scanf("%s",&file);
fi=fopen(file,"r");
fo=fopen("inter.c","w");
fop=fopen("oper.c","r");
fk=fopen("key.c","r");
c=getc(fi);
while(!feof(fi))
{
if(isalpha(c)||isdigit(c)||(c=='['||c==']'||c=='.'==1))
```

```
fputc(c,fo);
else
{
```



```
if(c=='\n')
fprintf(fo,"\t$\t");
else fprintf(fo,"\t%c\t",c);
}
c=getc(fi);
}
fclose(fi);
fclose(fo);
fi=fopen("inter.c","r");
printf("\n Lexical Analysis");
fscanf(fi,"%s",a);
printf("\n Line: %d\n",i++);
while(!feof(fi))
{
if(strcmp(a,"$")==0)
{
printf("\n Line: %d \n",i++);
fscanf(fi,"%s",a);
}
fscanf(fop,"%s",ch);
while(!feof(fop))
{
if(strcmp(ch,a)==0)
{
fscanf(fop,"%s",ch);
printf("\t\t%s\t:\t%s\n",a,ch);
flag=1;
} fscanf(fop,"%s",ch);
}
rewind(fop);
fscanf(fk,"%s",ch);
while(!feof(fk))
{
if(strcmp(ch,a)==0)
{
fscanf(fk,"%k",ch);
printf("\t\t%s\t:\tKeyword\n",a);
flag=1;
}
```

```
fscanf(fk,"%s",ch);
}
rewind(fk);
if(flag==0)
{
if(isdigit(a[0]))
printf("\t\t%s\t:\tConstant\n",a);
else
printf("\t\t%s\t:\tIdentifier\n",a);
}
flag=0;
fscanf(fi,"%s",a); }
getch();
}
```

Input Files:

Oper.c

```
( open para
) closepara
{ openbrace
} closebrace
< lesser
> greater
" doublequote ' singlequote
: colon
; semicolon
# preprocessor
= equal
== asign
% percentage
^ bitwise
& reference
* star
+ add
- sub
\ backslash
/ slash
```

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Key.C

```
int
void
main
char
if
for
while
```

else
printf
scanf
FILE
Include
stdio.h
conio.h
iostream.h
Input.c

```
#include "stdio.h"
#include "conio.h"
void main()
{
int a=10,b,c;
a=b*c;
getch();
}
```

Output:-