1) **Write a LEX program to print all the constants in the given C source program file.**
   Input Source Program: (sample.c)

```
#define PI 3.14
#include<stdio.h>
#include<conio.h>
  void main()
  {

  int a,b,c = 30;
  printf("hello");
  }
digit [0-9]
%{
int cons=0;
%}pq;a
%%
{digit}+ { cons++; printf("%s is a constant\n", yytext);  }
.|\n { }
%%
int yywrap(void) {
return 1; }
int main(void)
{
FILE *f;
char file[10];
printf("Enter File Name : ");
scanf("%s",file);
f = fopen(file,"r");
yyin = f;
yylex();
printf("Number of Constants : %d\n", cons);
fclose(yyin);
}
```

2) **Write a LEX program to identify the capital words from the given input.**

```
%{
#include<stdio.h>
%}

%%
[A-Z]+[ \t\n] {printf("%s is a capital letter", yytext);}
. ;
%%
int main()
{
printf("\n Enter the input string:");
yylex();
}
```

```
int yywrap()
{
return 1;
}
```

3) **Write a LEX Program to check the email address is valid or not.**

```
%{
#include<stdio.h>
%}
%%
[a-zA-Z0-9_]+(@[a-z]+)(.[a-z]+) {printf("%s is a valid email", yytext);}
.* {printf("It is not a valid email");}
%%
int main()
{
printf("\n Enter the email:");
yylex();
}
int yywrap()
{
return 1;
}
```

4) **The Company ABC runs with employees with several departments. The Organization manager had all the mobile numbers of employees. Assume that you are the manager and need to verify the valid mobile numbers because there may be some invalid numbers present. Implement a LEX program to check whether the mobile number is valid or not.**

```
%{
%}
%%
[6-9][0-9]{9} {printf("\nMobile Number Valid\n");}
.+ {printf("\nMobile Number Invalid\n");}
%%
int main()
{
        printf("\nEnter Mobile Number : ");
        yylex();
        printf("\n");
        return 0;
}
int yywrap()
{
}
```

5) **A networking company wants to validate the URL for its clients. Write a LEX program to implement the same.**

```
%%
```

```
www\.[a-zA-Z0-9.-]+\.(com|in) { printf("Valid URL\n"); }
.+ {  printf("invalid URL\n"); }
%%
int yywrap(){}
int main()
{
printf("enter url=");
 yylex();
 return 0;
}
```

6) **School management wants to validate the DOB of all students. Write a LEX program to implement it.**

```
%{
#include<stdio.h>
%}
%%
[0-9][0-9]\/[0-1][0-9]\/[1-2][0-9]{3} { printf("Valid");}
.+ printf("Invalid");
%%
int main()
{
printf("enter date=");
yylex();
}
int yywrap()
{
return 1;
}
```

7) **Write a LEX program to check whether the given input is a digit or not.**

```
%{
#include<stdio.h>
#include<stdlib.h>
%}
%%
^[0-9]* printf("digit");
^[^0-9]|[0-9]*[a-zA-Z] printf("not a digit");
. ;
%%
int main()
{
printf("enter input");
yylex();
}
int yywrap()
{
return 1;
```

```
        }
```

8) **Design a lexical Analyzer to validate operators to recognize the operators +,-,*,/ using regular Arithmetic operators.**

```
%{
#include<stdio.h>
%}
%%

"="|"+"|"-"|"/"|"*" { printf("valid");}
.+ {printf("invalid");}
%%
int yywrap(){}
int main()
{
printf("enter the input:");
yylex();
return 0;
}
```

9) **Write a FLEX (Fast Lexical Analyzer) program that should perform the token separation for the given C program and display with appropriate caption.**

```
digit [0-9]
letter [a-zA-Z]
%{
int cid,ckey;
%}
%%
(stdio.h|conio.h) {printf("%s is a standard library\n",yytext);}
(include|void|main|printf|int) {printf("%s is a keyword\n",yytext); ckey++;}
{letter}({letter}|{digit})* {printf("%s is a identifier\n",yytext); cid++;}
{digit}+ {printf("%s is a number\n",yytext);}
\"(\\.|[^"\\])*\" {printf("%s is a string literal\n",yytext);}
.|\n { }
%%
int yywrap(void)
{
return 1;
}
```

10) **Write a LEX program which adds line numbers to the given C program file and display the same in the standard output.**

Input Source Program: (sample.c)
#define PI 3.14
#include<stdio.h>
#include<conio.h>
void main()

```
    {
    int a,b,c = 30;
    printf("hello");
    }
%{
int yylineno;
%}
%%
^(.*)\n printf("%4d\t%s", ++yylineno, yytext);
%%
int yywrap(void) {
return 1;
}
int main(int argc, char *argv[]) {
yyin = fopen(argv[1], "r");
yylex();
fclose(yyin);
}
```

11) **Write a LEX program to count the number of Macros defined and header files included in the C program.**

Input Source Program: (sample.c)
```
#define PI 3.14
#include<stdio.h>
#include<conio.h>
void main()
{
int a,b,c = 30;
printf("hello");
}
%{

int nmacro,nheader;

%}

%%

^#define {nmacro++;}

^#include {nheader++;}

.|\n { }

%%

int yywrap(void)
```

```
{

return 1;

}

int main(int argc,char *argv[])

{

yyin=fopen(argv[1],"r");

yylex();

printf("number of macros defined=%d\n",nmacro);

printf("number of header files included=%d\n",nheader);

fclose(yyin);

}
```

12) Write a LEX program to print all HTML tags in the input file.

Input Source Program: (sample.html)
<html>
<body>
<h1>My First Heading</h1>
<p>My first paragraph.</p>
</body>
</html>

```
%{

int tags;

%}

%%

"<"[^>]*">"  { tags++;}

.|\n {}

%%

int yywrap(void)

{

return 1;

}

int main(int argc, char *argv[]) {

yyin = fopen(argv[1],"r");

yylex();
```

```c
printf("\n Number of html tags: %d",tags);
fclose(yyin);
}
```