



# VIT<sup>®</sup>

## Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

**B.Tech. Winter Semester 2023-24**

**School Of Electronics Engineering**

**(SENSE)**

**COMPILER DESIGN**

**BCSE307P**

**LAB Experiment - 2**

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**21BLC1607**

## **QUESTION1: Taking input and printing the output in terminal only.**

### **C - Program -**

```
%{  
#include<stdio.h>  
%}  
%%  
bool|int|float {printf("Keyword");}  
[-,+]?[0-9]+ {printf("Constants");}  
  
[,.']+ {printf("Punctuation Chars");}  
  
[!@#$%^&()+] {printf("Special Chars");}  
[a-zA-Z]+ {printf("Identifiers");}  
%%  
int yywrap()  
{return 1;  
}  
void main()  
{  
yylex();  
}
```

## Output -

```
parallels@ubuntu-linux-22-04-desktop: ~/21BLC1607
parallels@ubuntu-linux-22-04-desktop:~$ ls
21BLC1607      Pictures    boot.bin~    floppy3.img
Desktop       Public     boot2.bin    helloworld.asm
Documents     Templates  boot3.bin    processInfo.h
Downloads     VIT        firstBootLoader.asm  secBootLoader.asm
Lexical_Analyser.c  Videos    floppy1.img  snap
Music         a.out      floppy2.img
parallels@ubuntu-linux-22-04-desktop:~$ cd 21BLC1607/
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gedit
```

```
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gedit lexprogram.l
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ lex lexprogram.l
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gcc lex.yy.c
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ ./a.out
x=10*a+b/b*a
Identifiers=Constants*Identifiers+Identifiers/Identifiers*Identifiers
```

**QUESTION2:** Input is given through file and output is given through terminal

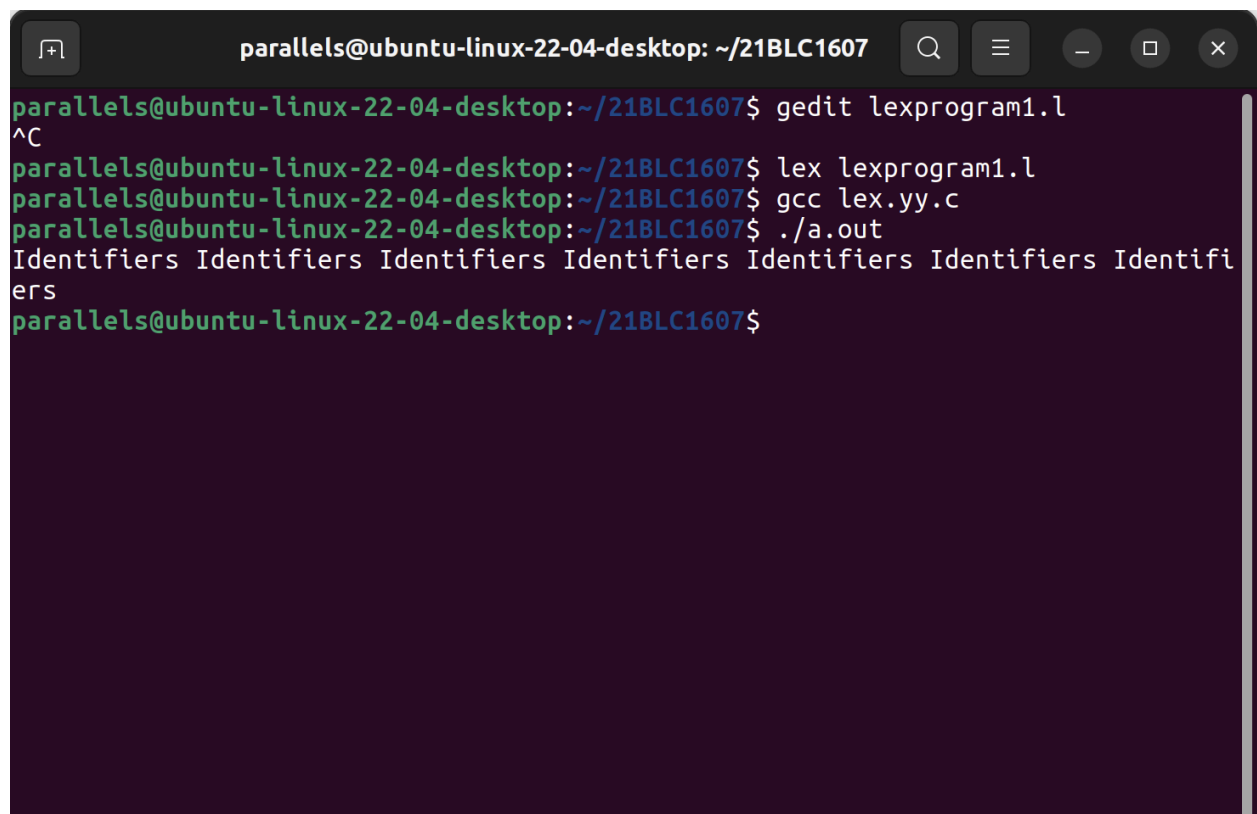
## C - Program -

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

bool|int|float {printf("Keyword");}
[-+]?10-91+ {printf("Constants");}
[,.';]+ {printf("Punctuation Chars");}
[!@#$%^&()+]{printf("Special Chars");}
[a-zA-Z]+ {printf("Identifiers");}
```

```
%%  
int yywrap()  
{return 1;  
}  
int main()  
{  
extern FILE *yyin;  
yyin = fopen("inp.txt","r");  
while(!feof(yyin)) {  
yylex();  
}  
}
```

## **Output -**



```
parallels@ubuntu-linux-22-04-desktop: ~/21BLC1607  
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gedit lexprogram1.l  
^C  
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ lex lexprogram1.l  
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gcc lex.yy.c  
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ ./a.out  
Identifiers Identifiers Identifiers Identifiers Identifiers Identifiers Identifiers  
ers  
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$
```

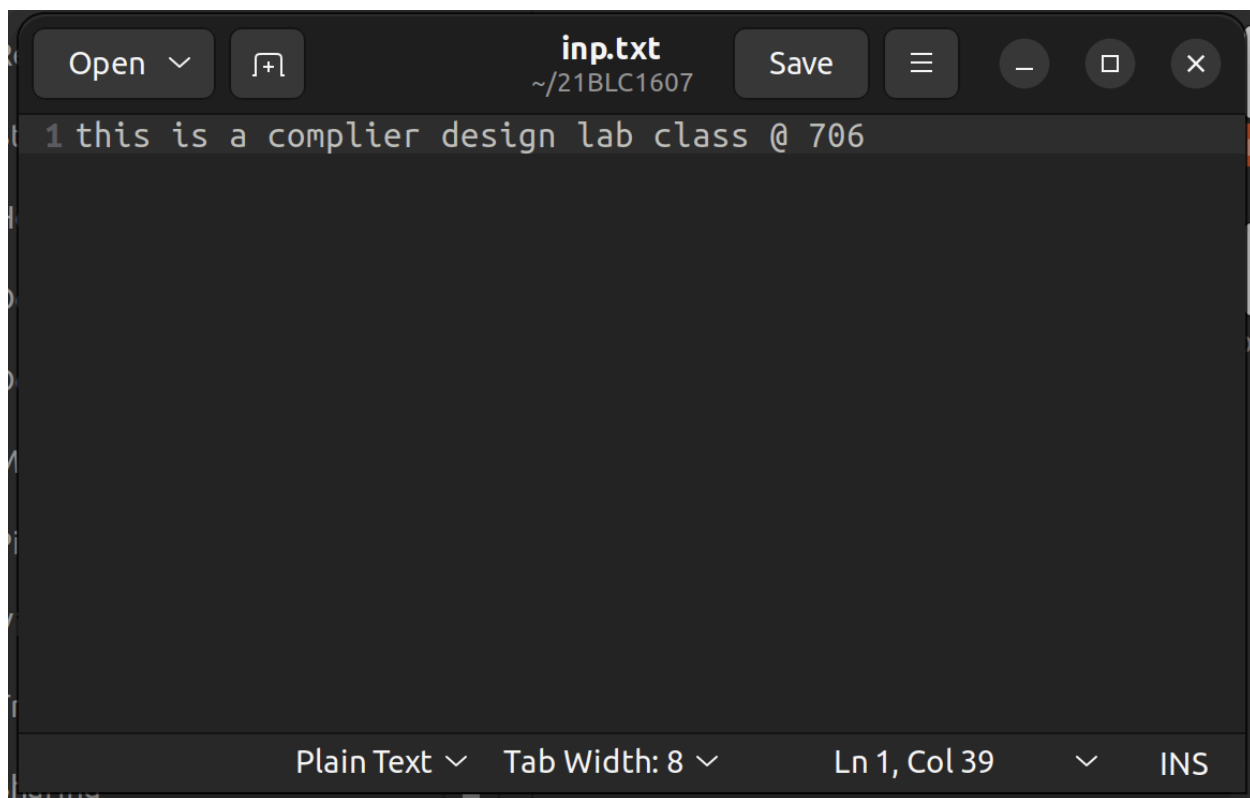
## **QUESTION3: Input is given through file and output is given through terminal**

### **C - Program -**

```
%{
#include<stdio.h>
%}
%%
bool|int|float {(fprintf(yyout, "Keyword",yytext));}
[-, +]?[0-91]+ {fprintf(yyout,"Constants",yytext);}
[,.';]+ {fprintf(yyout, "Punctuation Chars",yytext);}
[!@#$%^&()+] {fprintf(yyout,"Special Chars",yytext);}
[a-zA-Z]+ {fprintf(yyout,"Identifiers",yytext);}
%%
int yywrap()
{return 1;
}
int main()
{
extern FILE *yyin;
yyin=fopen("inp.txt","r");
yyout = fopen("out.txt","w");
while(!feof(yyin)){
yylex();
}
}
```

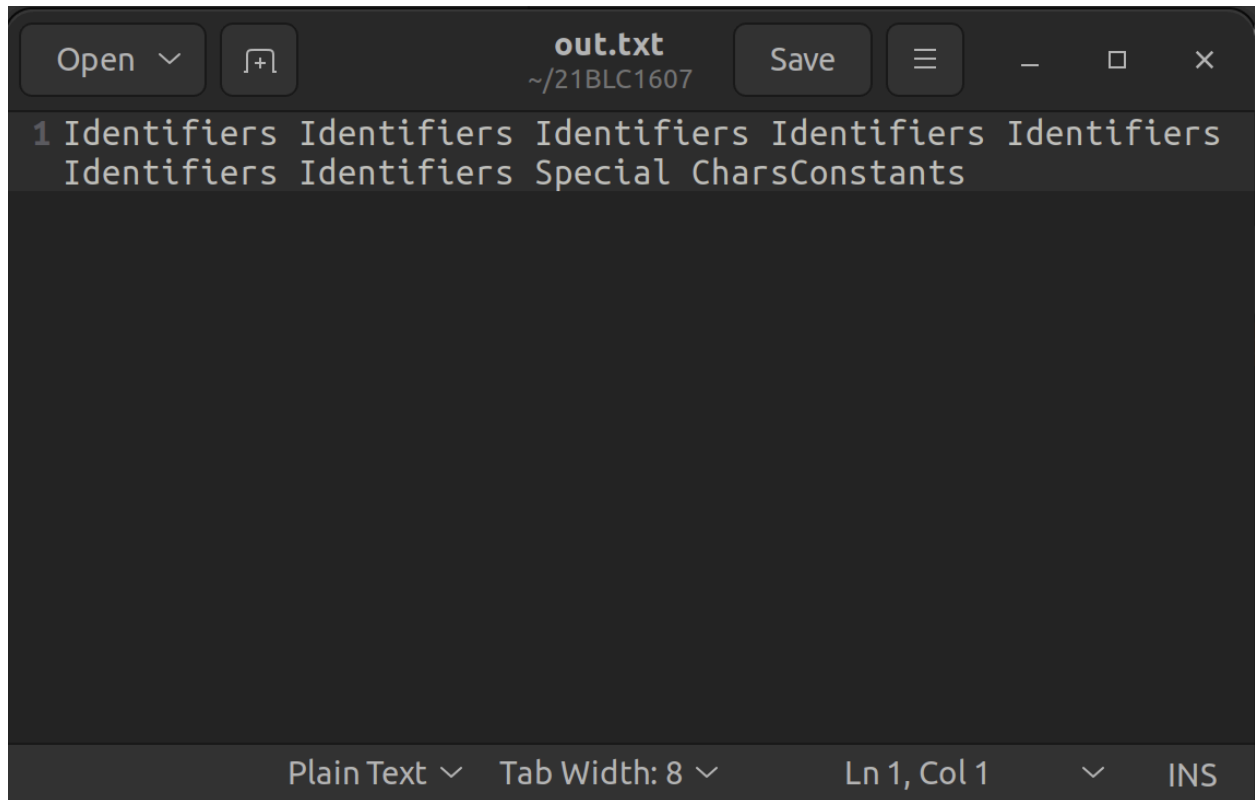
## Output -

```
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ flex lexprogrsm3.l
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gcc lex.yy.c
lexprogrsm3.l: In function 'yylex':
lexprogrsm3.l:5:18: warning: too many arguments for format [-Wformat-extra-args]
  5 | bool|int|float {(fprintf(yyout, "Keyword",yytext));}
    |                  ^~~~~~
lexprogrsm3.l:6:16: warning: too many arguments for format [-Wformat-extra-args]
  6 | [-, +]?[0-91]+ {fprintf(yyout,"Constants",yytext);}
    |                  ^~~~~~
lexprogrsm3.l:7:17: warning: too many arguments for format [-Wformat-extra-args]
  7 | [,.';]+ {fprintf(yyout, "Punctuation Chars",yytext);}
    |                  ^~~~~~
lexprogrsm3.l:8:16: warning: too many arguments for format [-Wformat-extra-args]
  8 | [!@#$^&()+ {fprintf(yyout,"Special Chars",yytext);}
    |                  ^~~~~~
lexprogrsm3.l:9:16: warning: too many arguments for format [-Wformat-extra-args]
  9 | [a-zA-Z]+ {fprintf(yyout,"Identifiers",yytext);}
    |                  ^~~~~~
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ ./a.out
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$
```



The screenshot shows a code editor window titled 'inp.txt' with the path '~/.21BLC1607'. The editor has a dark theme and a toolbar with buttons for 'Open', 'Save', and window controls. The main text area contains a single line of text: '1 this is a compiler design lab class @ 706'. The status bar at the bottom indicates 'Plain Text', 'Tab Width: 8', 'Ln 1, Col 39', and 'INS' mode.

```
inp.txt
~/.21BLC1607
Open Save
1 this is a compiler design lab class @ 706
Plain Text Tab Width: 8 Ln 1, Col 39 INS
```



```
1 Identifiers Identifiers Identifiers Identifiers Identifiers
  Identifiers Identifiers Special Chars Constants
```

**QUESTION 4: Write a lex program to check the date as valid or invalid given as input**

**C- Program -**

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

DIGIT [0-9]

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

DAY (0[1-9]|12[0-9]|3[01])

YEAR [0-9]{4}

%%

```
{MONTH}"/"{DAY}"/"{YEAR} {
```

```
    int month = atoi(yytext);
```

```
    int day = atoi(yytext + 3);
```

```
    int year = atoi(yytext + 6);
```

```
    if (month < 1 || month > 12) {
```

```
        printf("%s is an invalid date.\n", yytext);
```

```
        return 0;
```

```
    }
```

```
    if ((day < 1) || (day > 31) ||
```

```
        ((month == 4 || month == 6 || month == 9 || month == 11) && (day > 30)) ||
```

```
        (month == 2 && ((year % 4 != 0) || (year % 100 == 0 && year % 400 != 0))  
&& (day > 28)) ||
```

```
        (month == 2 && day > 29)) {
```

```
        printf("%s is an invalid date.\n", yytext);
```

```
        return 0;
```

```
    }
```



```
    printf("%s is a valid date.\n", yytext);
}

.\n    ;
%%

int main() {
    printf("Enter the date as MM/DD/YYYY format.\n ");
    yylex();
    return 0;
}
```

## OUTPUT -

```
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gedit datechecker.l
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ flex datechecker.l
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ gcc lex.yy.c
parallels@ubuntu-linux-22-04-desktop:~/21BLC1607$ ./a.out
Enter the date as MM/DD/YYYY format.
01/30/2024
01/30/2024 is a valid date.
```