Github Link: https://github.com/916RasnitaRadu/SEM5-FLCD/tree/main/Lab8

Lex Specification File:

```
%{
   #include <stdio.h>
   #include <stdlib.h>
   #include <string.h>

   int lines = 1;
%}
%option noyywrap
%option caseless

DIGIT            [0-9]
NON_ZERO_DIGIT      [1-9]
LETTER            [a-zA-Z]
IDENTIFIER         [a-zA-Z_][a-zA-Z0-9_]*
CHAR             \'[a-zA-Z0-9]\'
INTEGER           0|[+|-]?[1-9][0-9]*
STRING            \"[a-zA-Z0-9]*\"

%%

"if"|"else"|"while"|"for"|"integer"|"string"|"char"|"read"|"print"|"return"|"start"|"arr" {printf("%s - reserved word\n", yytext);}
"+"|"-"|"*"|"/"|"%"|"<="|">="|"=="|"!="|"<"|">"|"=" {printf("%s - operator\n", yytext);}
"{"|"}"|"("|")"|"["|"]"|":"|";"|","|"'"|"\"" {printf("%s - separator\n", yytext);}

{IDENTIFIER} {printf("%s - identifier\n", yytext);}
{INTEGER} {printf("%s - integer\n", yytext);}
{STRING} {printf("%s - string\n",yytext);}
{CHAR} {printf("%s - character\n", yytext);}
```

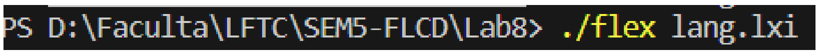
```
[ \t]+  {}
[\n]+   {lines++;}


[0-9][a-zA-Z0-9_]*                                    {printf("Illegal identifier at line %d\n", lines);}
[+|-]0                                         {printf("Illegal numeric constant at line %d\n", lines);}
[+|-]?[0][0-9]*                                printf("Illegal numeric constant at line %d\n", lines);}
[\'][a-zA-Z0-9 ]{2,}[\']|[\'][a-zA-Z0-9 ][a-zA-Z0-9 ][\']                {printf("Illegal character
constant at line %d\n", lines);}


%%
int main(int argc, char** argv) {
   if (argc > 1) {
      FILE* file;
      file = fopen(argv[1], "r");
      if (!file) {
         fprintf(stderr, "Could not open %s!\n", argv[1]);
         exit(1);
      }
      yyin = file;
   }
   yylex();
   return 0;
}
```

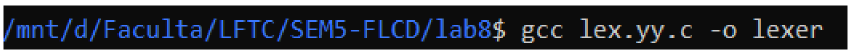
Demo

We first run the command



```
PS D:\Faculta\LFTC\SEM5-FLCD\Lab8> ./flex lang.lxi
```

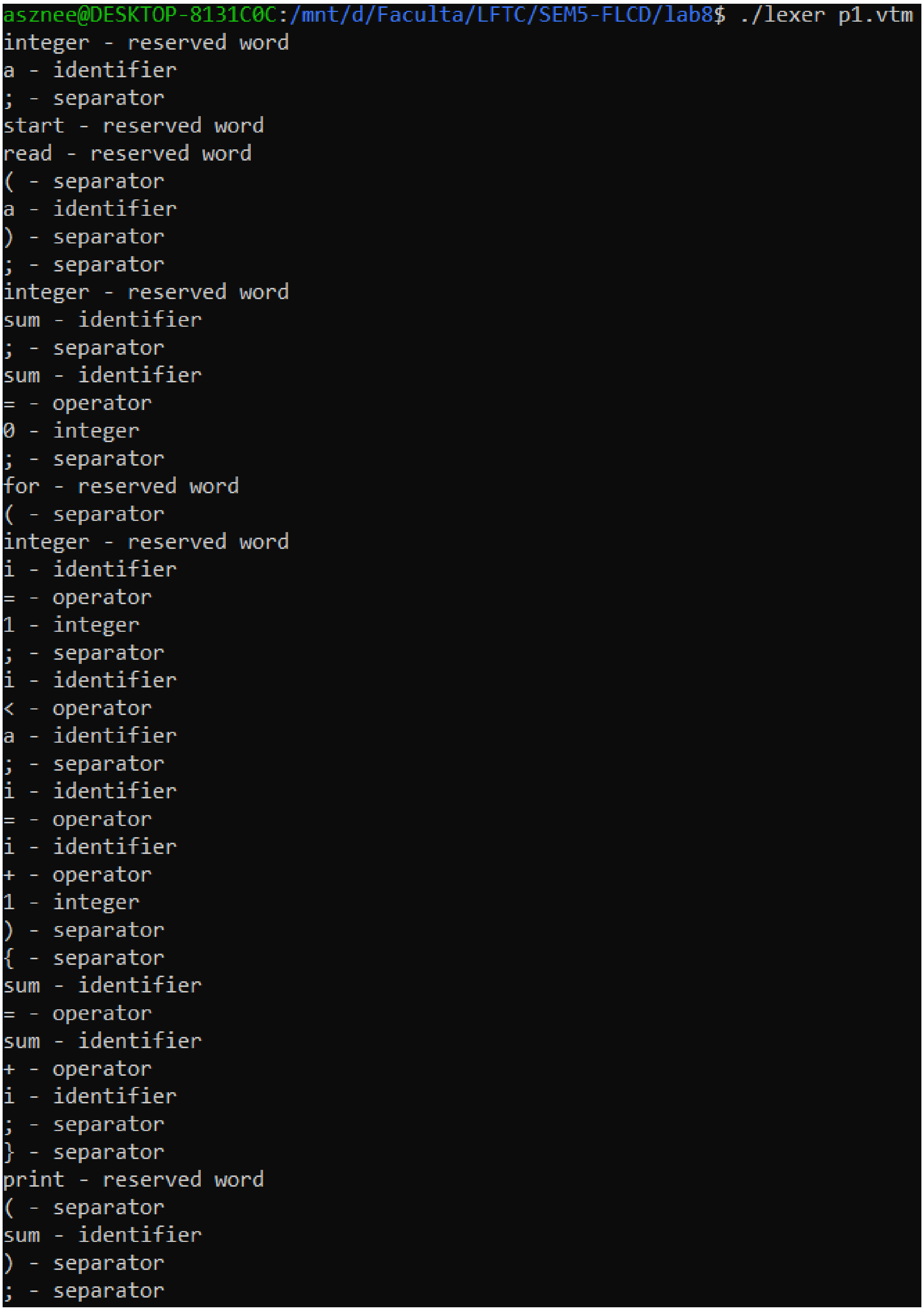
Next, we compile the generated C file



```
/mnt/d/Faculta/LFTC/SEM5-FLCD/lab8$ gcc lex.yy.c -o lexer
```

Finally, an executable is created which represents the scanner (lexer). We run this executable on one of the input files.

The result is:



```
asznee@DESKTOP-8131C0C:/mnt/d/Faculta/LFTC/SEM5-FLCD/lab8$ ./lexer p1.vtm
integer - reserved word
a - identifier
; - separator
start - reserved word
read - reserved word
( - separator
a - identifier
) - separator
; - separator
integer - reserved word
sum - identifier
; - separator
sum - identifier
= - operator
0 - integer
; - separator
for - reserved word
( - separator
integer - reserved word
i - identifier
= - operator
1 - integer
; - separator
i - identifier
< - operator
a - identifier
; - separator
i - identifier
= - operator
i - identifier
+ - operator
1 - integer
) - separator
{ - separator
sum - identifier
= - operator
sum - identifier
+ - operator
i - identifier
; - separator
} - separator
print - reserved word
( - separator
sum - identifier
) - separator
; - separator
```