

# Formal Languages and Compilers

Lab10

Flex - Working with files

# Work with files

- ▶ `extern FILE *yyin, *yyout;` - in the code section, in `main()` (input-output pointer)
  - ▶ `yyin` - input file
  - ▶ `yyout` - output file
- ▶ `yytext` - holds the value of current matched token
- ▶ `yyleng` - length of matched string

# Work with files

- ▶ `strcmp()` - function that compares two strings character by character (if they are equal, the function returns 0)
- ▶ `fopen()` function is used to open a file
- ▶ Returns file pointer or NULL
- ▶ Modes:
  - ▶ 'r' - read (only if the file exists)
  - ▶ 'w' - creates empty file for writing (if file already exists, it is replaced with the new, empty file)
  - ▶ 'a' - append to a file (appends data at the end of the file; if the file does not exist, it is created)
  - ▶ 'r+' - read and write (only if file exists)
  - ▶ 'w+' - creates an empty file for both reading and writing
  - ▶ 'a+' - opens a file for both append and read

# Example

- Find how many times a word appears in a file

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

char word [] = "FILS";
int count = 0;

%}

%%
[a-zA-Z]+ { if(strcmp(yytext, word)==0)
            count++; }
. ;
%%

int yywrap() //returns 1 if done and 0 if not done
{
    return 1;
}

int main()
{
    extern FILE *yyin, *yyout;

    yyin=fopen("file.txt", "r");
    yylex();

    /*%d takes integer value as signed decimal integer for count variable
    printf("The word FILS appears %d number of times ", count);

}
}
```

file.txt - Notepad

File Edit Format View Help

FILS is the Faculty of Engineering in Foreign Languages.  
FILS has Bachelor programs in English, French, German.  
I cannot wait to graduate from FILS.  
The FILS building is smaller than other UPB buildings.

D:\Facultate\Predat\FormalLanguagesAndCompilers\Lab\L11>flex test.l

D:\Facultate\Predat\FormalLanguagesAndCompilers\Lab\L11>gcc lex.yy.c

D:\Facultate\Predat\FormalLanguagesAndCompilers\Lab\L11>a.exe

The word FILS appears 4 number of times

# Example

- Replace spaces, tabs and newlines in a .txt file and save them in a new .txt file

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

%%
[ \n\t]+ {fprintf(yyout, "");}
.      { fprintf(yyout, "%s", yytext); }

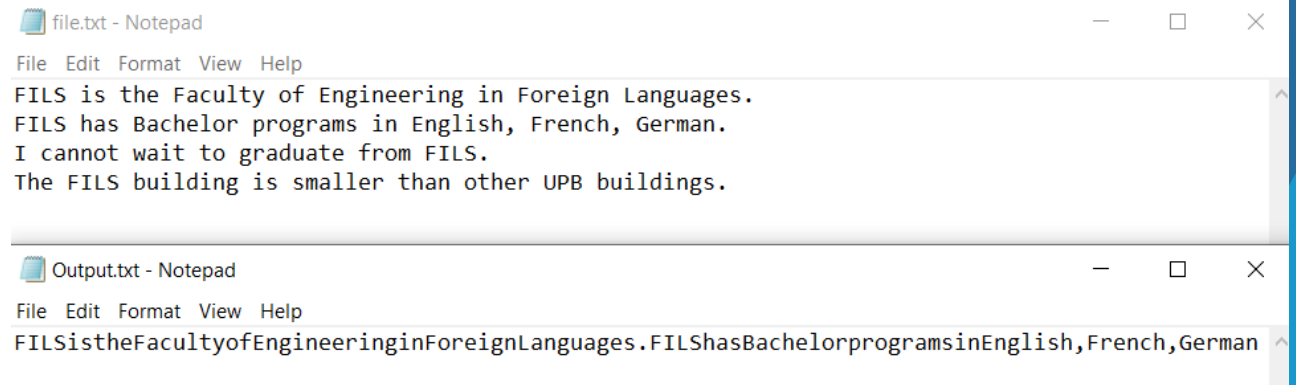
%%

int yywrap(){}

int main()
{
    extern FILE *yyin, *yyout;
    yyin = fopen("file.txt", "r");

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

    yylex();
    return 0;
}
```



# Exercises

1. Create a FLEX program which verifies if the string inputted by the user is a valid URL
2. Create a FLEX program which adds numbers to each line in a txt file
3. Create a FLEX program which replaces a word with another one in a file

# Homework

1. Create a FLEX program which verifies if the string inputted by the user has the date format DD/MM/YYYY
2. Create a flex file which recognizes if a given string is an email address.
3. Create a FLEX program which deletes comments in an IDE of your choice (e.g., in VSC single-line comments start with // and multi-line comments are between /\* \*/ , in Spyder, a single-line comment start with # and multi-line comments are between """ ). Please specify in a comment for which one