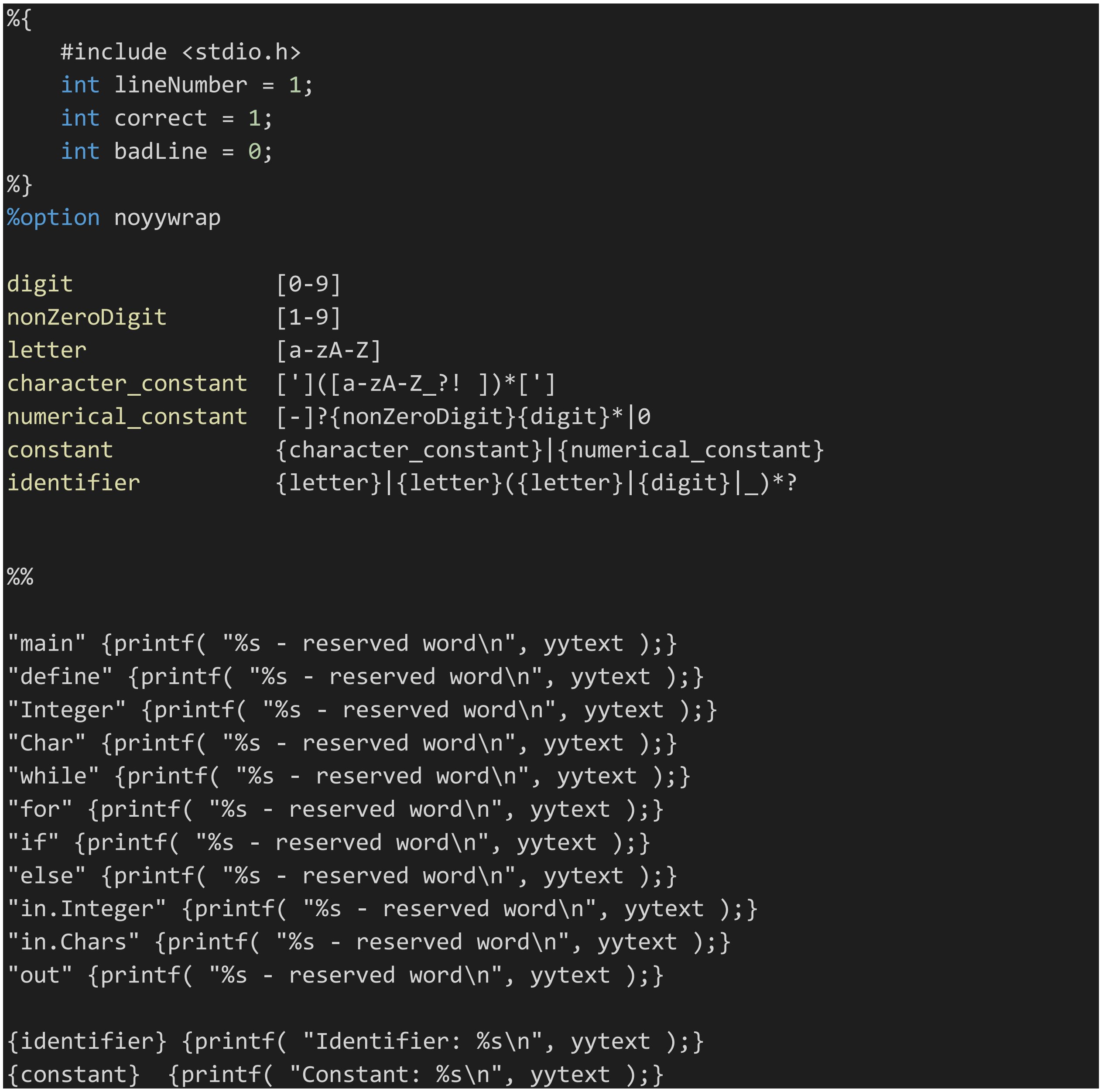
Lab 08 documentation

Github link:
https://github.com/timoteicopaciu/LFCD/tree/main/Lab_08

Lang.lxi



```
%{
    #include <stdio.h>
    int lineNumber = 1;
    int correct = 1;
    int badLine = 0;
%}
%option noyywrap

digit                   [0-9]
nonZeroDigit            [1-9]
letter                  [a-zA-Z]
character_constant      ['']([a-zA-Z_?! ])*['']
numerical_constant      [-]?{nonZeroDigit}{digit}*|0
constant                {character_constant}|{numerical_constant}
identifier              {letter}|{letter}({letter}|{digit}|_)*?


%%

"main" {printf( "%s - reserved word\n", yytext );}
"define" {printf( "%s - reserved word\n", yytext );}
"Integer" {printf( "%s - reserved word\n", yytext );}
"Char" {printf( "%s - reserved word\n", yytext );}
"while" {printf( "%s - reserved word\n", yytext );}
"for" {printf( "%s - reserved word\n", yytext );}
"if" {printf( "%s - reserved word\n", yytext );}
"else" {printf( "%s - reserved word\n", yytext );}
"in.Integer" {printf( "%s - reserved word\n", yytext );}
"in.Chars" {printf( "%s - reserved word\n", yytext );}
"out" {printf( "%s - reserved word\n", yytext );}

{identifier} {printf( "Identifier: %s\n", yytext );}
{constant}  {printf( "Constant: %s\n", yytext );}
```

```
"[" {printf("%s - as separator\n", yytext);}
"]" {printf("%s - as separator\n", yytext);}
"{" {printf("%s - as separator\n", yytext);}
"}" {printf("%s - as separator\n", yytext);}
"(" {printf("%s - as separator\n", yytext);}
")" {printf("%s - as separator\n", yytext);}
";" {printf("%s - as separator\n", yytext);}
"," {printf("%s - as separator\n", yytext);}

"+" {printf("%s - as operator\n", yytext);}
"-" {printf("%s - as operator\n", yytext);}
"*" {printf("%s - as operator\n", yytext);}
"/" {printf("%s - as operator\n", yytext);}
"%" {printf("%s - as operator\n", yytext);}
">>" {printf("%s - as operator\n", yytext);}
"<=" {printf("%s - as operator\n", yytext);}
">=" {printf("%s - as operator\n", yytext);}
"==" {printf("%s - as operator\n", yytext);}
"!=" {printf("%s - as operator\n", yytext);}
"=" {printf("%s - as operator\n", yytext);}
"<" {printf("%s - as operator\n", yytext);}
">" {printf("%s - as operator\n", yytext);}


[ \t]+      {}

[\n]+   {++lineNumber;}

. {correct = 0; badLine = lineNumber; printf("Incorrect:%s\n", yytext);}


%%
void 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();
if(correct == 1)
    printf("Correct program!");
else
    printf("Incorrect program at line %d!", badLine);
}
```

Demo:

Run output for p1.txt

p1.txt

```
main{
        define Integer x , y , copy_x , p ;
        y = 0;
        p = 1;
        in.Integer>> x;
        copy_x = x;
        while(x != -0){
                y = y + (x % 10) * p;
                p = p * 10;
                x = x / 10;
        }

        if(y == copy_x){
                out('The_integer_is_palindrome!');
        }
        else{
                out('The_integer_is_not_palindrome!');
        }
}
```

Output:

```
main - reserved word
{ - as separator
define - reserved word
Integer - reserved word
Identifier: x
, - as separator
Identifier: y
, - as separator
Identifier: copy_x
, - as separator
Identifier: p
; - as separator
Identifier: y
= - as operator
Constant: 0
; - as separator
Identifier: p
= - as operator
Constant: 1
; - as separator
in.Integer - reserved word
>> - as operator
Identifier: x
; - as separator
Identifier: copy_x
= - as operator
Identifier: x
```

```
; - as separator
while - reserved word
( - as separator
Identifier: x
!= - as operator
- - as operator
Constant: 0
) - as separator
{ - as separator
Identifier: y
= - as operator
Identifier: y
+ - as operator
( - as separator
Identifier: x
% - as operator
Constant: 10
) - as separator
* - as operator
Identifier: p
; - as separator
Identifier: p
= - as operator
Identifier: p
* - as operator
Constant: 10
; - as separator
Identifier: x
= - as operator
Identifier: x
/ - as operator
Constant: 10
; - as separator
} - as separator
if - reserved word
( - as separator
Identifier: y
== - as operator
Identifier: copy_x
) - as separator
{ - as separator
out - reserved word
( - as separator
Constant: 'The_integer_is_palindrome!'
) - as separator
; - as separator
} - as separator
else - reserved word
{ - as separator
out - reserved word
( - as separator
Constant: 'The_integer_is_not_palindrome!'
) - as separator
; - as separator
} - as separator
} - as separator
```

Correct program!