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USER GUIDE
LEXICAL ANALYSIS

Glosary

Develop

C++, standard libraries

How to run the program

1. Download the files

2. Run the terminal command line on your computer and write the following: g++ lexical analysis.cpp

3. Wait until the compile process is complete and then write the following: lexical analysis.exe (windows) or /a.out (Linux and Mac)

Input

Txt file name

Output

The identification of the valid tokens for this program

Sample Input

Input1.txt

Input1.txt

```
b=7
a = 32.4 *(-8.6 - b)/       6.1E-8
d = a ^ b // Esto es un comentario
```

Sample Output

TOKEN		TYPE
b	----->	Variable
=	----->	Assigment
7	----->	Integer
a	----->	Variable
=	----->	Assigment
32.4	----->	Float
*	----->	Multiplication
(	----->	Left parenthesis
-8.6	----->	Float
-	----->	Substraction
b	----->	Variable
)	----->	Right parenthesis
/	----->	Division
6.1E-8	----->	Float
d	----->	Variable
=	----->	Assigment

a -----> Variable

^ -----> Power

b -----> Variable

// Esto es un comentario -----> Comment

Definitions

$$Digit = \{0 - 9\}$$

$$Lower\ Case = \{a - z\}$$

$$Capital\ Letter = \{A - Z\}$$

$$Underscore = \{'\_'\}$$

$$Operators = \{'=' \mid '+' \mid '-' \mid '*' \mid '/' \mid '^'\}$$

$$Special\ Symbol = \{'(' \mid ')'\}$$

$$Blank\ Space = \{' '\}$$

$$End\ Line = \{'\backslash n'\}$$

$$Letter = \{Lower\ Case \mid Capital\ Letter\}$$

$$Integer = \{Digit^{+}\}$$

$$Negative\ Number = \{'-' Integer\}$$

$$Variable = \{Letter(Letter|Digit|Underscore)^{*}\}$$

$$Scientific\ Notation = \{(e|E)\ (Integer|Negative\ Number)\}$$

$$Float = \{(Integer\ |Negative\ Number)\ '.'\ (Integer|\mathcal{E})(Scientific\ Notation\ |\mathcal{E})\}$$

$$Valid\ Token = \{Digit|Letter|Underscore|Operators|Special\ Symbol|Blank\ Space|End\ Line|'.'\}$$

$$Token = \{Valid\ Token^{+}\}$$

$$Comment = \{/^{2}\ \ (Valid\ Token)^{*}\ End\ Line\}$$

$$Line = \{Valid\ Token^{*}(Comment|\mathcal{E}|\emptyset)\}$$

$$TXT = \{Line^{+}\}$$

$$End\ Of\ File = \{\emptyset\}$$

Transition Table

	A	B	C	D	E
TXT	B	$\emptyset$	$\emptyset$	$\emptyset$	$\emptyset$
$Line$	$\emptyset$	C	$\emptyset$	$\emptyset$	$\emptyset$

Token	∅	∅	*D*	∅	∅
Special Symbol	∅	∅	∅	*C*	∅
Blank Space	∅	∅	∅	*C*	∅
Variable	∅	∅	∅	*C*	∅
Float	∅	∅	∅	*C*	∅
Integer	∅	∅	∅	*C*	∅
Operators	∅	∅	∅	*C*	∅
End Line	∅	∅	∅	*B*	∅
Comment	∅	∅	∅	*B*	∅
End Of File	∅	*E*	∅	∅	∅

Deterministic Finite Automaton