

Lexic.txt:

Alphabet:

- a. Lower case letters (a-z) of the English alphabet
- b. Decimal digits (0-9)
- c. Underscore ('\_')

1. Lexic:

a. Special symbols:

- Operators: + - \* / == && || != ++ -- < <= > >=
- Separators: space : () [] {} \n
- Reserved words: integer, char, string, return, next, if, elsif, else, end, FOR, WHILE, puts, break

b. Identifiers:

- A sequence of letters and digits, such that the first character is a letter; the rule is:
  - identifier = " " letter {letter | digit} " \_ "
  - letter = "a" | "b" | ... | "z"
  - digit = "0" | "1" | ... | "9"

c. Constants:

1. Integer - rule:

const\_nr = 0 | ["+"|"-"] nz\_digit {digit}

digit = "0" | "1" | ... | "9"

nz\_digit = "1" | "2" | ... | "9"

2. Character - rule:

char = 'letter' | 'digit' | 'special\_char'

special\_char = ! | ? | " | : | ; | # | \$ | % | ^ | & | ...

3. String - rule:

string = "{char}"

Token.in:

+

-

\*

/

=

==

&&

||

!=

++

==

<

<=

>

>=

\n

space

:

()

[]

{}

integer

char

string

return

next

if  
elsif  
else  
end  
FOR  
WHILE  
puts  
break

Syntax.in

## 2. Syntax:

The words - predefined tokens are specified between " and ":

### a) Syntactical rules:

- program = "statements\_seq"
- statements\_seq = statement {statement}
- statement = declaration | simple\_statement | struct\_statement
- declaration = type identifier
- type = ("integer" | "char" | "string") | array\_type
- array\_type = ("integer" | "char" | "string") "[" number "]"
- simple\_statement = assignment\_statement | io\_statement
- struct\_statement = if\_statement | for\_statement | while\_statement
- compound\_statement = "START" statement\_seq "END"
- assignment\_statement = identifier "=" expression
- expression = term | expression op expression
- term = identifier | number | string
- op = "+" | "-" | "\*" | "/"
- io\_statement = "puts" "(" identifier ")" | "puts" "(" const ")"
- if\_statement = "if" condition statement {elsif condition statement} [else statement]
- for\_statement = "for" assignment\_statement; condition; statement
- while\_statement = "while" condition compound\_statement
- condition = expression relation expression
- relation = "<" | "<=" | "==" | "!=" | ">=" | ">"