

Граматика мови програмування

Program = "program" ProgramName {StatementsList} "endprogram" .
 ProgramName = Identifier .
 StatementsList = {Statement Delimiter} .
 Statement = LoopStatement | ConditionalStatement | InputStatement |
 OutputStatement | DeclarationStatement | SetStatement .
 LoopStatement = "do while" "(" LogicalExpression ")" StatementsList "enddo" .
 ConditionalStatement = "if" LogicalExpression "then" StatementsList "fi" .
 InputStatement = "read" "(" Identifier ")" .
 OutputStatement = "write" "(" Identifier ")" .
 DeclarationStatement = "var" Identifier {SetOperator} .
 SetStatement = Identifier "set" ArithmeticExpression .
 LogicalExpression = ArithmeticExpression ("equals" | "greaterthn" | "lessth")
 ArithmeticExpression .
 ArithmeticExpression = Sign ArithmeticLeaf | ArithmeticExpression Operation
 ArithmeticExpression .
 ArithmeticLeaf = Value | Identifier .
 Operation = "+" | "-" | "*" | "/" .
 Value = Float | Integer .
 Float = Sign Unsigned "." Unsigned .
 Integer = Sign Unsigned .
 Unsigned = Number { Number } .
 Sign = ["+" | "-"] .
 Number = "0" | "1" | "2" | "3" | "4" | "5" | "6" | "7" | "8" | "9" .
 Identifier = "@" Word .
 Word = (Letter | Number) [{Letter | Number}] .
 Letter = a | b | c | d | e | f | g | h | i | j | k | l | m | n | o | p | q | r | s | t | u | v | w | x | y | z .
 Empty = " " .
 Delimiter = "\n" .

Таблиця лексем

Приклад лексеми	Токен
program	program
endprogram	endprogram
do	do
while	while
enddo	enddo
if	if
then	then
fi	fi
read	read
write	write
set	set
var	var
equals	equals
greaterthn	greaterthn
lessth	lessth
+, -, *, /	operation
(,)	parentheses
‘ ’	ws
‘\n’	delimiter
@r1, @1r, @var	identifier
2, -12	integer
2.0, -12.12	float

Демонстраційний приклад

```
1  program @Main
2
3  var @first set 1
4  var @second set -23.5
5  var @third
6
7  if (@third equals @second)
8  then
9    read(@third)
10   write(@second)
11  fi
12
13  var @sum set 0
14  do while (@first lessthn 100)
15    @sum set @sum + @first
16    @first set @first + 1
17  enddo
```

Вихідні таблиці лексичного аналізатора

<i>Номер рядка</i>	<i>Лексема</i>	<i>Токен</i>	<i>Індекс</i>
1	program	program	
1	@Main	identifier	1
1		delimiter	
2		delimiter	
3	var	var	
3	@first	identifier	2
3	set	set	
3	1	integer	1
3		delimiter	
4	var	var	
4	@second	identifier	3
4	set	set	
4	-	operation	
4	23.5	float	2
4		delimiter	
5	var	var	
5	@third	identifier	4
5		delimiter	
6		delimiter	
7	if	if	
7	(parentheses	
7	@third	identifier	4
7	equals	equals	
7	@second	identifier	3
7)	parentheses	
7	then	then	
7		delimiter	
8	read	read	
8	(parentheses	
8	@third	identifier	4
8)	parentheses	
8		delimiter	
9	write	write	
9	(parentheses	
9	@second	identifier	3
9)	parentheses	
9		delimiter	
10	fi	fi	
10		delimiter	
11		delimiter	
12	var	var	
12	@sum	identifier	5

12	set	set	
12	0	integer	3
12	¶	delimiter	
13	do	do	
13	while	while	
13	(parentheses	
13	@first	identifier	2
13	lessth	lessth	
13	100	integer	4
13)	parentheses	
13	¶	delimiter	
14	@sum	identifier	5
14	set	set	
14	@sum	identifier	5
14	+	operation	
14	@first	identifier	2
14	¶	delimiter	
15	@first	identifier	2
15	set	set	
15	@first	identifier	2
15	+	operation	
15	1	integer	1
15	¶	delimiter	
16	enddo	enddo	
16	¶	delimiter	

Таблиця ідентифікаторів

Ідентифікатор	Тип	Індекс
@Main	program	1
@first	var	2
@second	var	3
@third	var	4
@sum	var	5

Таблиця констант

Константа	Індекс
1	1
23.5	2
0	3
100	4

