Léxico y gramática del lenguaje *Hivar*

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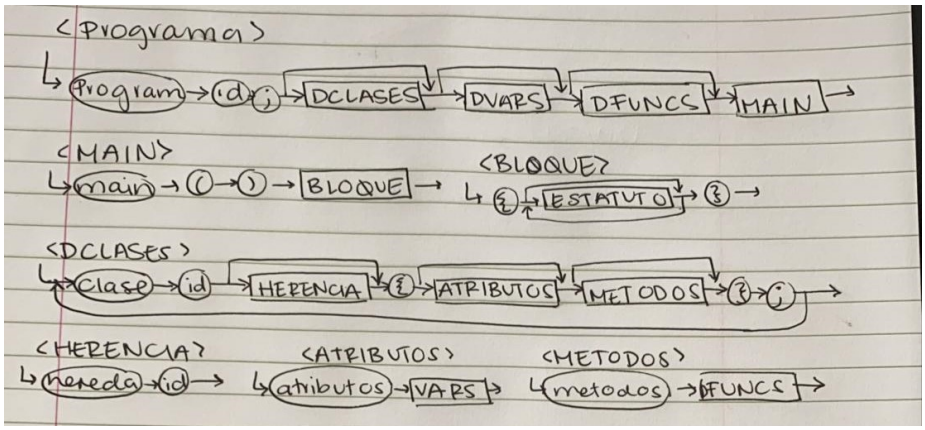
Léxico

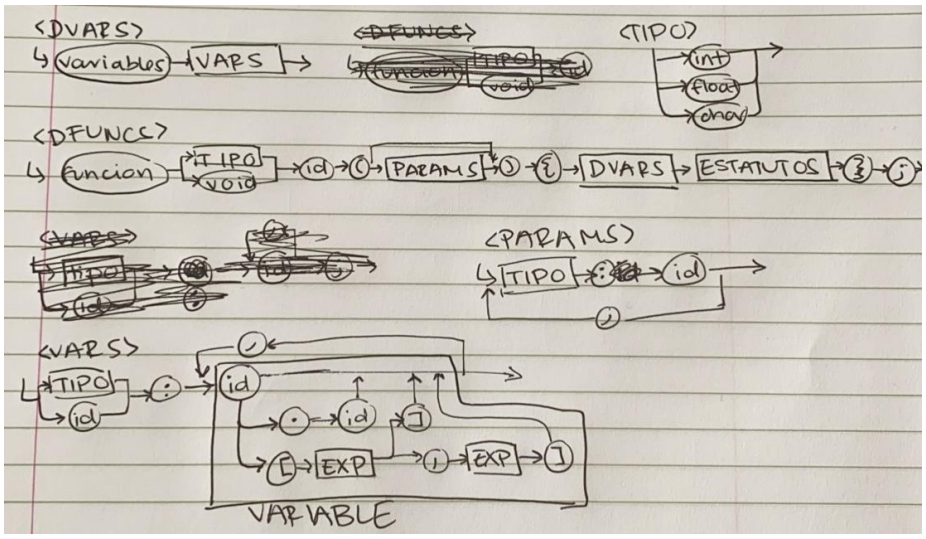
Token	Expresión regular	Ejemplo
PROGRAM_KEYWORD	program	program
MAIN_KEYWORD	main	main
CLASS_KEYWORD	class	class
INHERITS	inherits	inherits
ATTRIBUTES_KEYWORD	attributes	attributes
VARS_KEYWORD	variables	variables
END_VARS	byevar	byevar
METHODS_KEYWORD	methods	methods
FUNCTION	function	function
RETURN	return	return
READ	read	read
WRITE	write	write
INT	int	int
FLOAT	float	float
CHAR	char	char
VOID	void	void
IF	if	if
ELSIF	elsif	elsif
ELSE	else	else
WHILE	while	while
DO	do	do
FROM	from	from
TO	to	to
COMMA	,	,
PERIOD	\.	.
COLON	:	:
SEMICOLON	;	;
LEFT_PARENTHESIS	\(	(
RIGHT_PARENTHESIS	\)	)
LEFT_CURLY	\{	{
RIGHT_CURLY	\}	}
LEFT_BRACKET	\[	[
RIGHT_BRACKET	\]	]
NOT_EQUALS	!=	!=
EQUALS_COMPARISON	==	==
EQUALS_ASSIGNMENT	=	=
LESS_THAN	<	<

Token	Expresión regular	Ejemplo
GREATER_THAN	>	>
PLUS	\+	+
MINUS	\-	-
MULTIPLY	*	*
DIVIDE	\/	/
AND	&&	&&
OR	||	||
ID	[a-zA-Z][a-zA-Z0-9_]*	foo
CONST_FLOAT	\d+\.\d+	3.14
CONST_INT	\d+	123
CONST_STRING	\"([^\\\n]|(\\.))+\"	"Hello, world!"

Gramática

Diagramas de sintaxis

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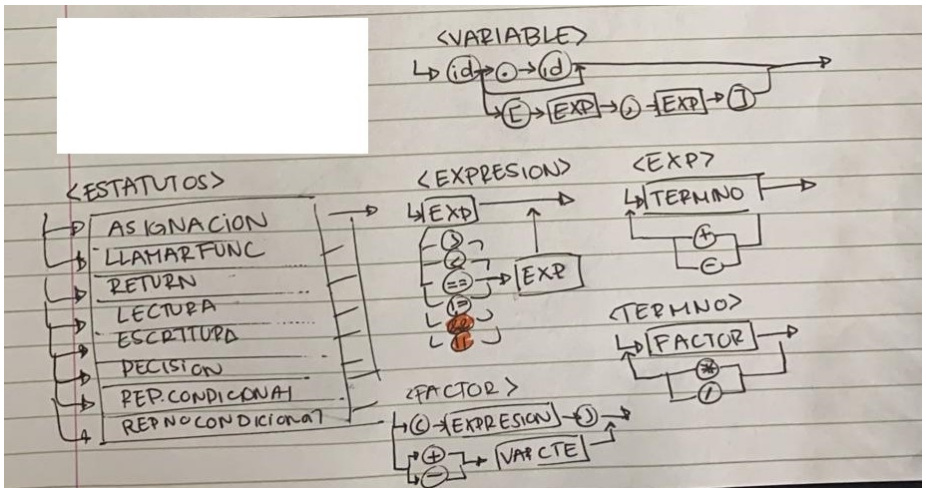
VARS
<DFUNCS>
<TIPO>
int
float
char
<DFUNCS>
funcion
TIPO
void
id
PARAMS
DVARS
ESTATUTOS
<PARAMS>
TIPO
id
<VARS>
TIPO
id
EXP
EXP
VARIABLE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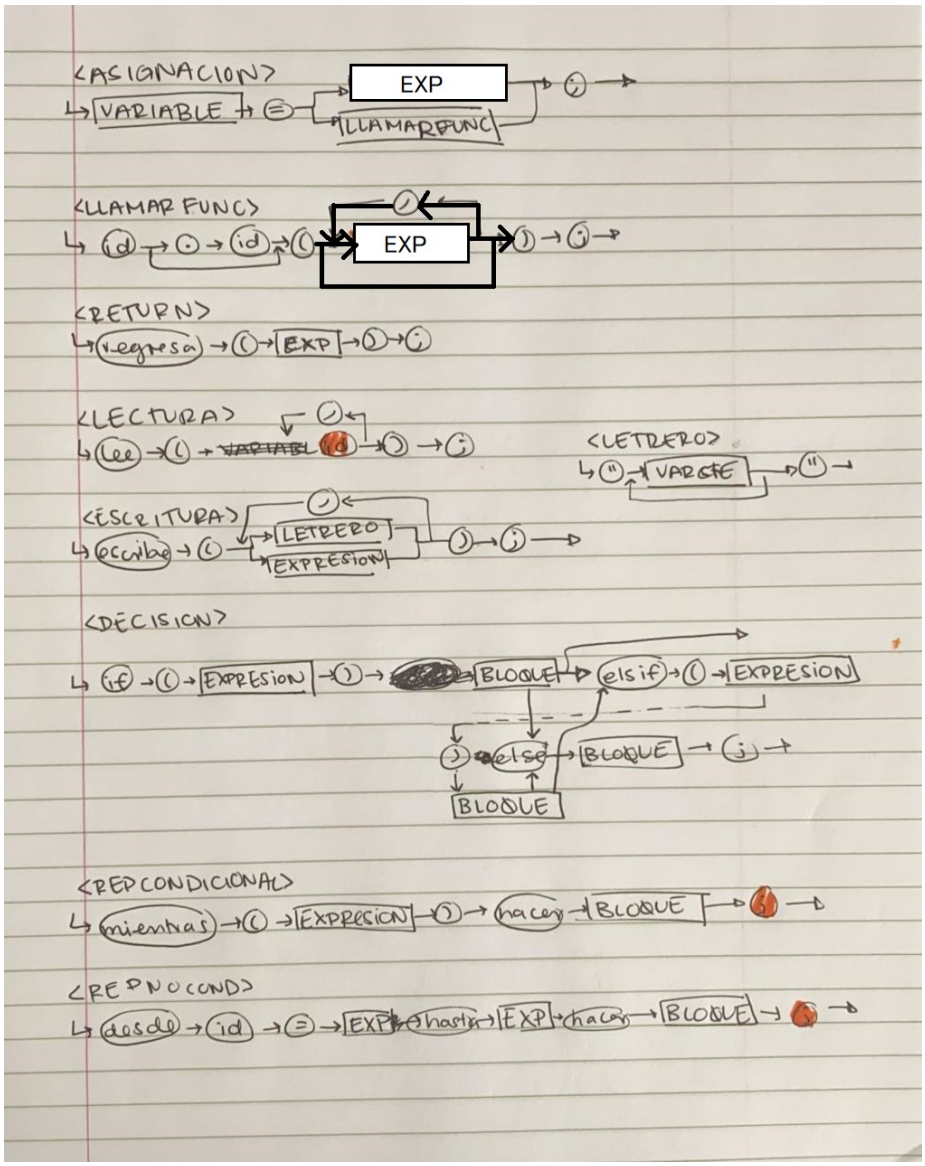
id
id
EXP
EXP
<ESTATUTOS>
ASIGNACION
LLAMARFUNC
RETURN
LECTURA
ESCRITURA
DECISION
REP.CONDICIONAL
REP.NOCONDICIONAL
<EXPRESION>
EXP
EXP
<EXP>
TERMINO
<TERMINO>
FACTOR
<FACTOR>
EXPRESION
VAR_CTE



Gramática formal

```
program      →  PROGRAM_KEYWORD ID SEMICOLON classes vars funcs main

classes      →  CLASS_KEYWORD ID inheritance LEFT_CURLY attributes methods
                RIGHT_CURLY SEMICOLON classes
             |  empty
```

```
inheritance  →  INHERITS ID
             |  empty

attributes   →  ATTRIBUTES_KEYWORD vars_1
             |  empty

methods      →  METHODS_KEYWORD funcs
             |  empty

vars         →  VARS_KEYWORD vars_1 END_VARS
             |  empty

vars_1       →  var_type COLON vars_2 vars_arr SEMICOLON vars_1
             |  var_type COLON vars_2 vars_arr SEMICOLON

vars_arr     →  LEFT_BRACKET vars_arr_1 RIGHT_BRACKET
             |  empty

vars_arr_1   →  vars_arr_2 COMMA vars_arr_2
             |  vars_arr_2

vars_arr_2   →  CONST_INT
             |  exp

type         →  INT
             |  FLOAT
             |  CHAR

var_type     →  type
             |  ID

vars_2       →  ID COMMA vars_2
             |  ID

funcs        →  FUNCTION func_type ID
                LEFT_PARENTHESIS parameters RIGHT_PARENTHESIS
                LEFT_CURLY vars block_1 RIGHT_CURLY SEMICOLON funcs_1

funcs_1      →  funcs
             |  empty

func_type    →  type
             |  VOID

parameters   →  parameters_1
             |  empty

parameters_1 →  var_type COLON ID parameters_2

parameters_2 →  COMMA parameters_1
             |  empty

main         →  MAIN_KEYWORD LEFT_PARENTHESIS RIGHT_PARENTHESIS block
                SEMICOLON
```

```
block        →  LEFT_CURLY block_1 RIGHT_CURLY

block_1      →  statement block_1
             |  empty

statement    →  statement_1 SEMICOLON

statement_1  →  assignment
             |  func_call
             |  return
             |  read
             |  write
             |  decision
             |  cond_loop
             |  non_cond_loop
             |  empty

assignment   →  variable EQUALS_ASSIGNMENT exp
             |  variable EQUALS_ASSIGNMENT func_call

variable     →  ID LEFT_BRACKET exp COMMA exp RIGHT_BRACKET
             |  ID PERIOD ID
             |  ID

expression   →  exp relational_op exp
             |  exp

relational_op → NOT_EQUALS
              | EQUALS_COMPARISON
              | LESS_THAN
              | GREATER_THAN
              | AND
              | OR

exp          →  term PLUS exp
             |  term MINUS exp
             |  term

term         →  factor MULTIPLY factor
             |  factor DIVIDE factor
             |  factor

factor       →  LEFT_PARENTHESIS expression RIGHT_PARENTHESIS
             | constant
             | variable
             | func_call
             | PLUS constant
             | MINUS constant

constant    →   CONST_INT
            |   CONST_FLOAT
```

```
func_call   →   ID PERIOD ID LEFT_PARENTHESIS func_call_1
                RIGHT_PARENTHESIS
            |   ID LEFT_PARENTHESIS func_call_1 RIGHT_PARENTHESIS

func_call_1  →  func_call_2
             |  empty

func_call_2  →  exp func_call_3

func_call_3  →  COMMA func_call_2
             |  empty

return       →  RETURN LEFT_PARENTHESIS exp RIGHT_PARENTHESIS

read         →  READ LEFT_PARENTHESIS read_1 RIGHT_PARENTHESIS

read_1       →  variable read_2

read_2       →  COMMA variable read_2
             |  empty

write        →  WRITE LEFT_PARENTHESIS write_1 RIGHT_PARENTHESIS

write_1      →  expression write_2
             |  CONST_STRING write_2

write_2      →  COMMA write_1
             |  empty

decision     →  IF LEFT_PARENTHESIS expression RIGHT_PARENTHESIS
                block elsif else

elsif        →  ELSIF LEFT_PARENTHESIS expression RIGHT_PARENTHESIS
                block elsif
             |  empty

else         →  ELSE block
             |  empty

cond_loop    →  WHILE LEFT_PARENTHESIS expression RIGHT_PARENTHESIS DO block

non_cond_loop → FROM ID EQUALS_ASSIGNMENT exp TO exp DO block
```