PascalM The Most Better BNF

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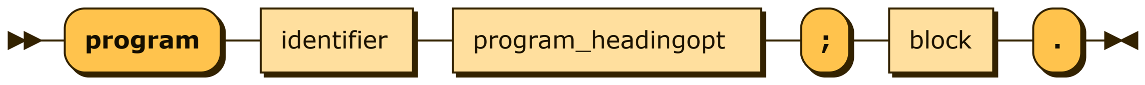
1 Introdução

A gramática PascalM é uma evolução da gramática padrão ISO do Pascal. Ela aprimora a definição de tipos estruturados, adiciona suporte mais claro para registros, arrays e variantes, além de incorporar uma definição mais rígida e completa para expressões compostas, operadores e listas de parâmetros.

2 Regras da Gramática

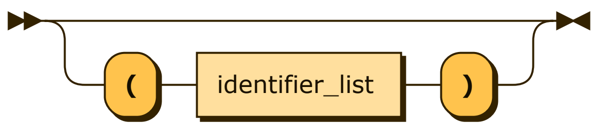
program:



program

program ::= 'program' identifier program_headingopt ';' block '.'

program_headingopt:



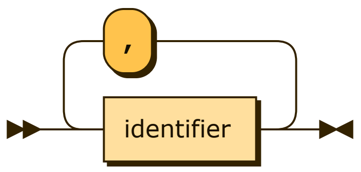
program_headingopt

program_headingopt ::= ('(' identifier_list ')')?

referenced by:

- program

identifier_list:



identifier_list

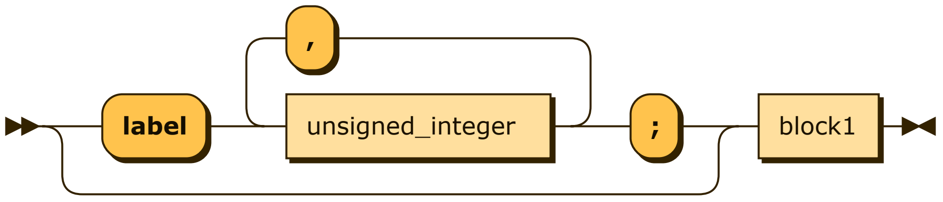
identifier_list ::= identifier (',' identifier)*

referenced by:

- program_headingopt

- simple_type

block:



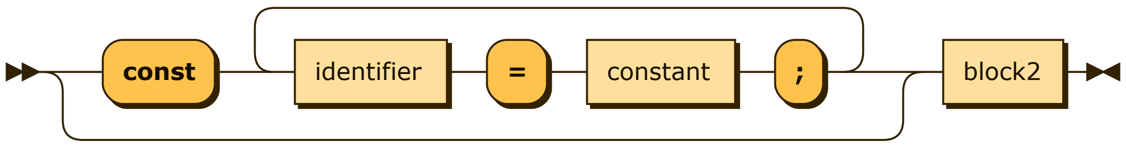
block

block ::= ('label' unsigned_integer (',' unsigned_integer)* ';')? block1

referenced by:

- block_or_forward
- program

block1:



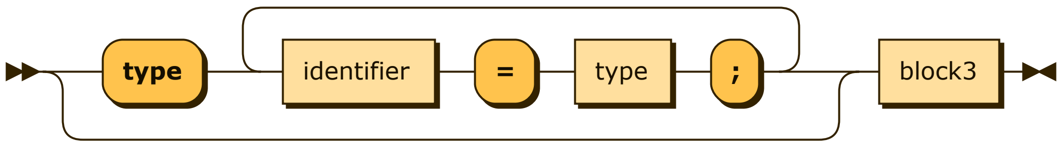
block1

block1 ::= ('const' (identifier '=' constant ';')+)? block2

referenced by:

- block

block2:



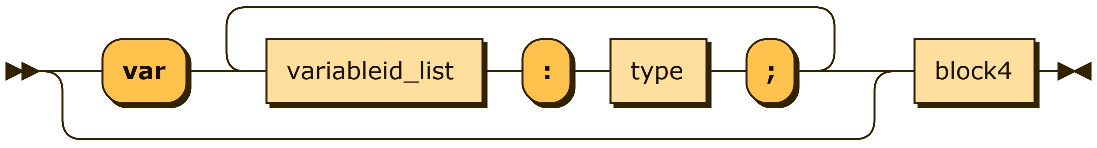
block2

block2 ::= ('type' (identifier '=' type ';')+)? block3

referenced by:

- block1

block3:



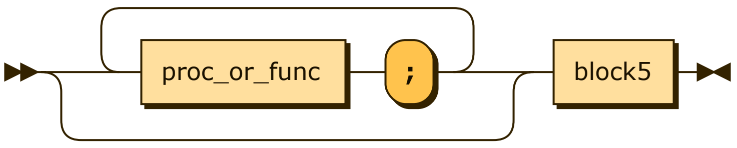
block3

block3 ::= ('var' (variableid_list ':' type ';')+)? block4

referenced by:

- block2

block4:



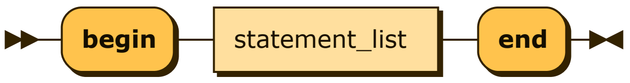
block4

block4 ::= (proc_or_func ';')* block5

referenced by:

- block3

block5:



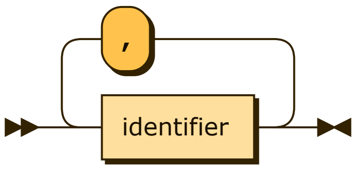
block5

block5 ::= 'begin' statement_list 'end'

referenced by:

- block4

variableid_list:



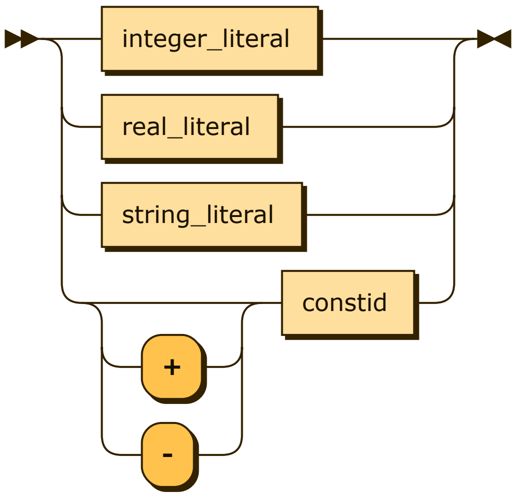
variableid_list

```
variableid_list :== identifier ( ',' identifier )*
```

referenced by:

- block3

constant:



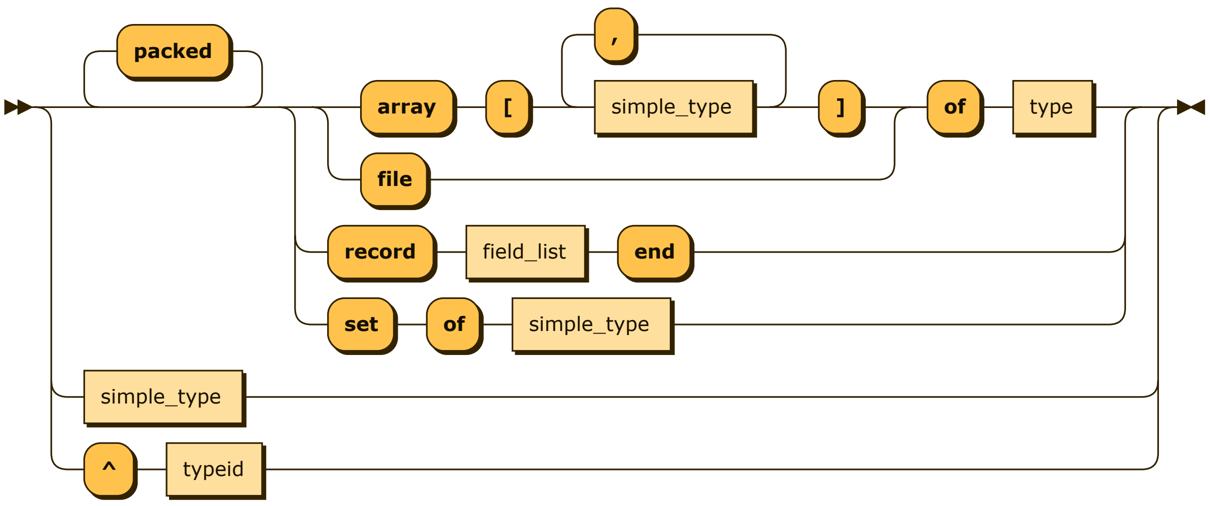
constant

```
constant ::=
integer_literal
    | real_literal
    | string_literal
    | ( '+' | '-' )?  constid
```

referenced by:

- block1
- case_label_list
- simple_type

type:



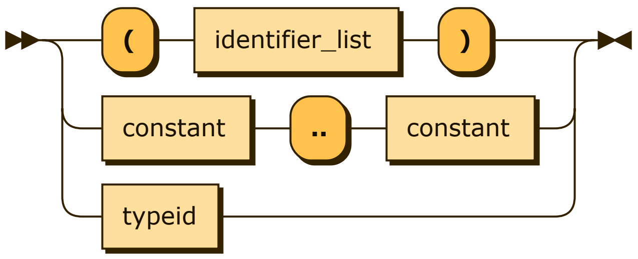
type

```
type ::= simple_type
    | 'packed'* ( ( 'array' '[' simple_type ( ',' simple_type )* ']' | 'file' )
'of' type | 'record' field_list 'end' | 'set' 'of' simple_type )
    | '^' typeid
```

referenced by:

- block2
- block3
- record_field
- type

simple_type:



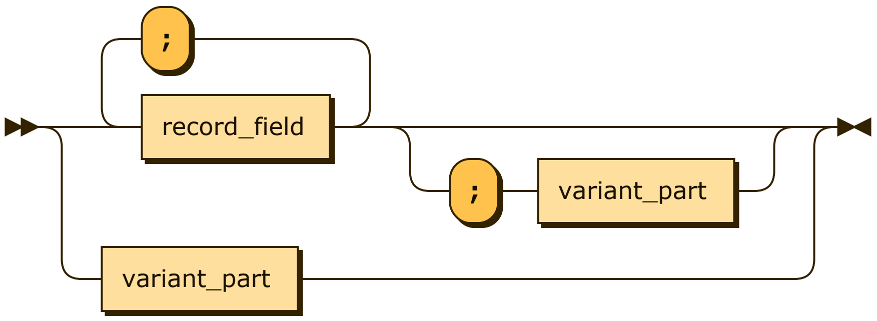
simple_type

simple_type ::= '(' identifier_list ')' | constant '..' constant | typeid

referenced by:

- type

field_list:



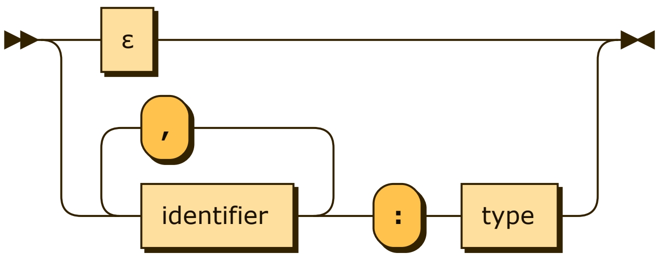
field_list

field_list ::= record_field (';' record_field)* (';' variant_part)? | variant_part

referenced by:

- type
- variant

record_field:



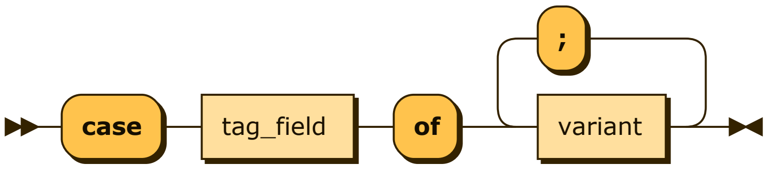
record_field

record_field ::= ε | identifier (',' identifier)* ':' type

referenced by:

- field_list

variant_part:



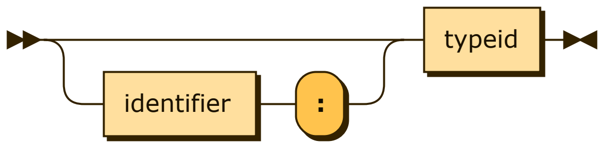
variant_part

variant_part ::= 'case' tag_field 'of' variant (';' variant)*

referenced by:

- field_list

tag_field:



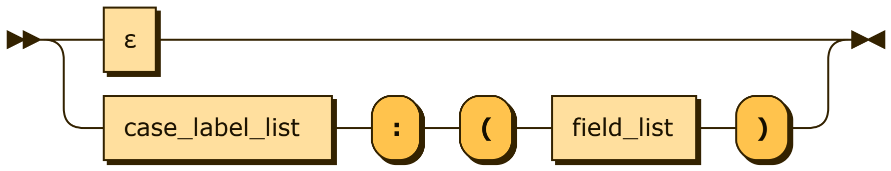
tag_field

tag_field ::= (identifier ':')? typeid

referenced by:

- variant_part

variant:



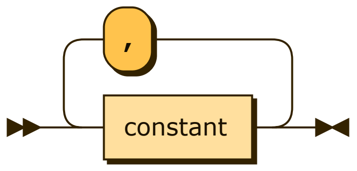
variant

variant ::= ε | case_label_list ':' '(' field_list ')'

referenced by:

- variant_part

case_label_list:



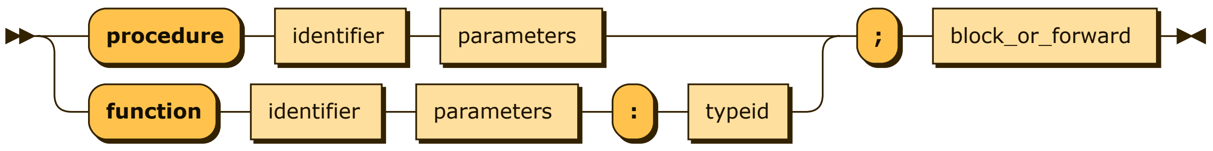
case_label_list

case_label_list ::= constant (',' constant)*

referenced by:

- case_element
- variant

proc_or_func:



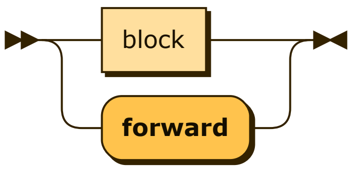
proc_or_func

proc_or_func ::= ('procedure' identifier parameters | 'function' identifier parameters ':' typeid) ';' block_or_forward

referenced by:

- block4

block_or_forward:



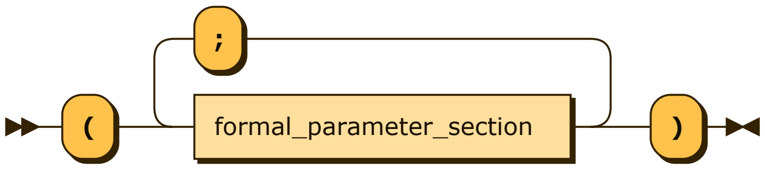
block_or_forward

block_or_forward ::= block | 'forward'

referenced by:

- proc_or_func

parameters:



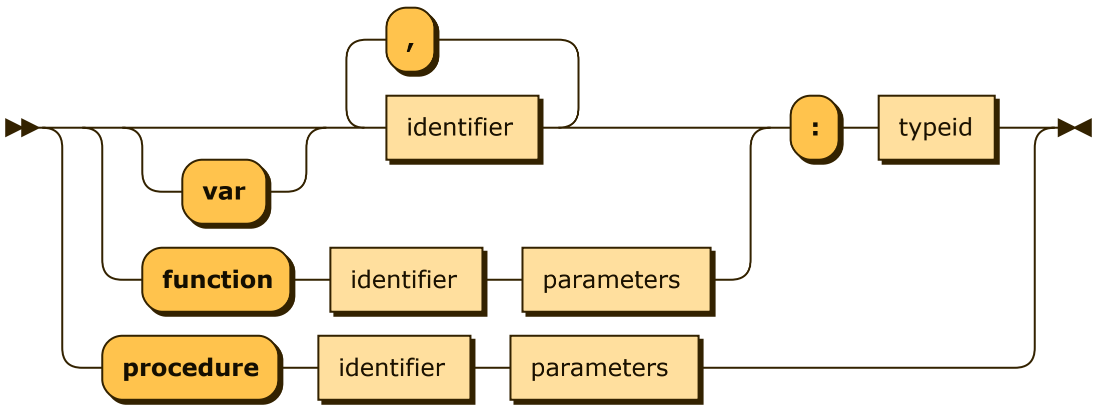
parameters

parameters ::= '(' formal_parameter_section (';' formal_parameter_section)* ')'

referenced by:

- formal_parameter_section
- proc_or_func

formal_parameter_section:



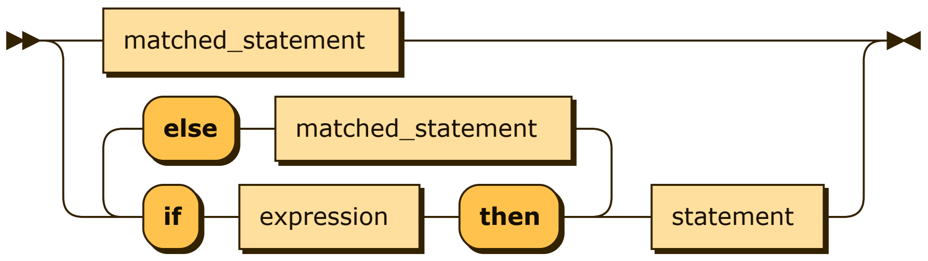
formal_parameter_section

formal_parameter_section ::= ('var'? identifier (',' identifier)* | 'function' identifier parameters) ':' typeid | 'procedure' identifier parameters

referenced by:

- parameters

statement:



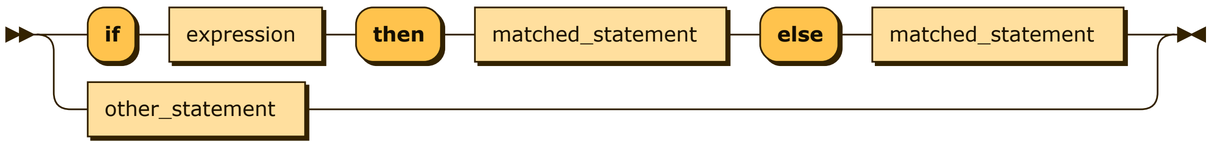
statement

statement ::= matched_statement | 'if' expression 'then' (matched_statement 'else' 'if' expression 'then')* statement

referenced by:

- case_element
- case_else
- other_statement
- statement
- statement_list

matched_statement:



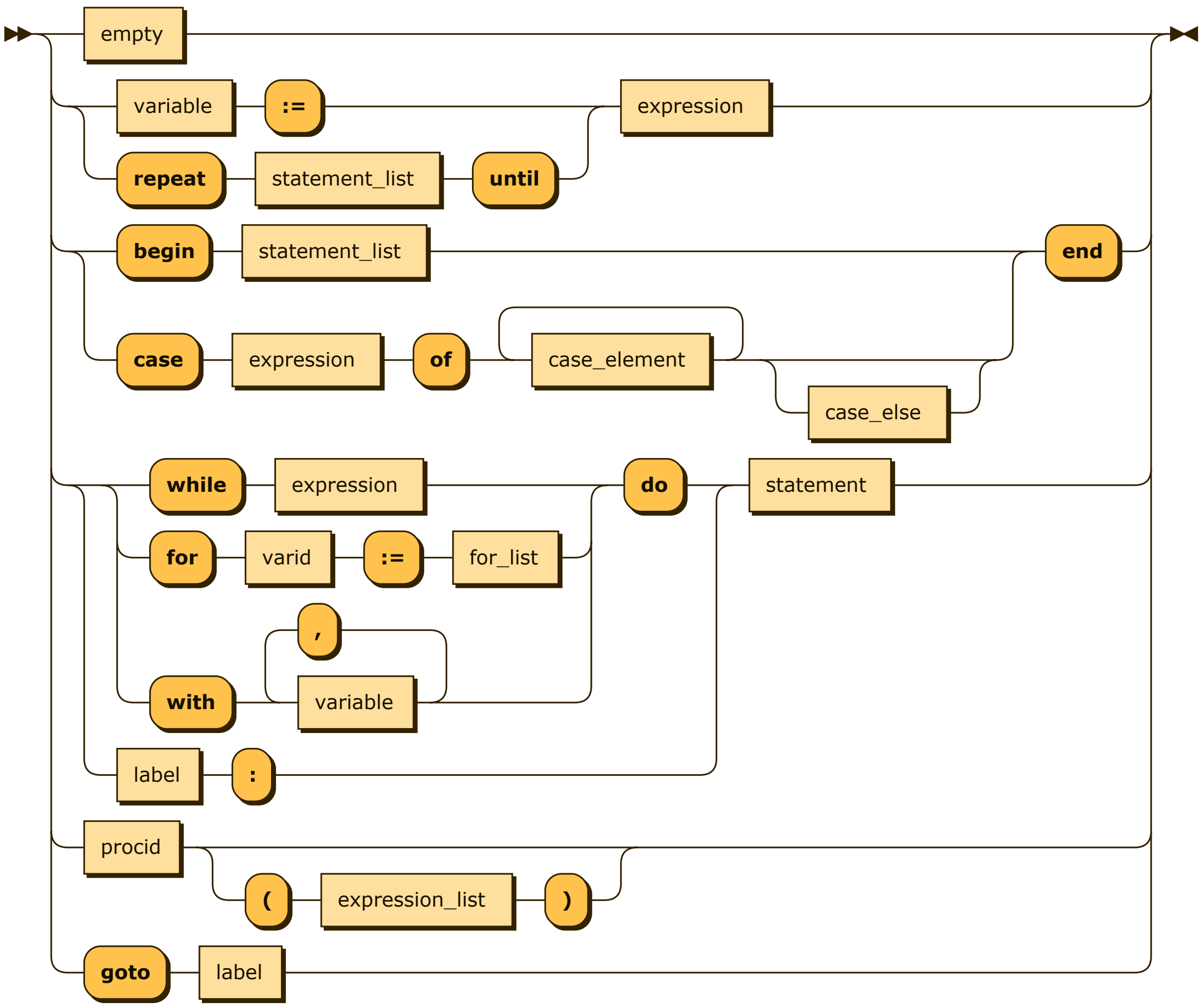
matched_statement

matched_statement ::= 'if' expression 'then' matched_statement 'else' matched_statement | other_statement

referenced by:

- matched_statement
- statement

other_statement:



other_statement

other_statement ::= empty | (variable ':=' | 'repeat' statement_list 'until') expression | ('begin' statement_list | 'case' expression 'of' case_element+ case_else?) 'end' | (('while' expression | 'for' varid ':=' for_list | 'with' variable (',' variable)*) 'do' | label ':') statement | procid ('(' expression_list ')')? | 'goto' label

referenced by:

- matched_statement

expression:

expression

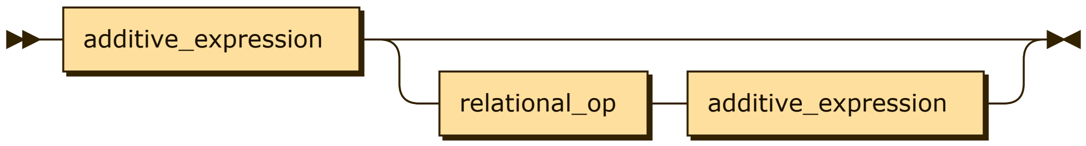
expression ::= relational_expression

referenced by:

- element
- expression_list
- for_list
- matched_statement

- other_statement
- primary_expression
- statement
- variable

relational_expression:



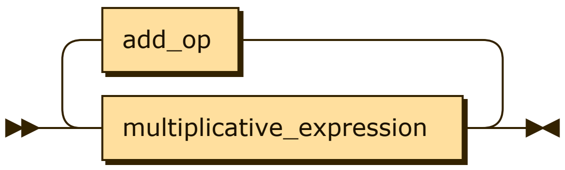
relational_expression

relational_expression ::= additive_expression (relational_op additive_expression)?

referenced by:

- expression

additive_expression:



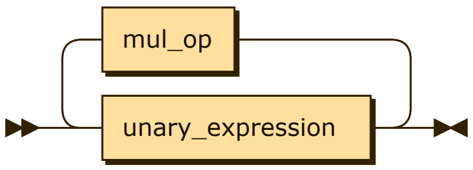
additive_expression

additive_expression ::= multiplicative_expression (add_op multiplicative_expression)*

referenced by:

- relational_expression

multiplicative_expression:



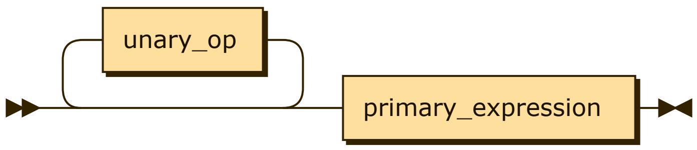
multiplicative_expression

multiplicative_expression ::= unary_expression (mul_op unary_expression)*

referenced by:

- additive_expression

unary_expression:



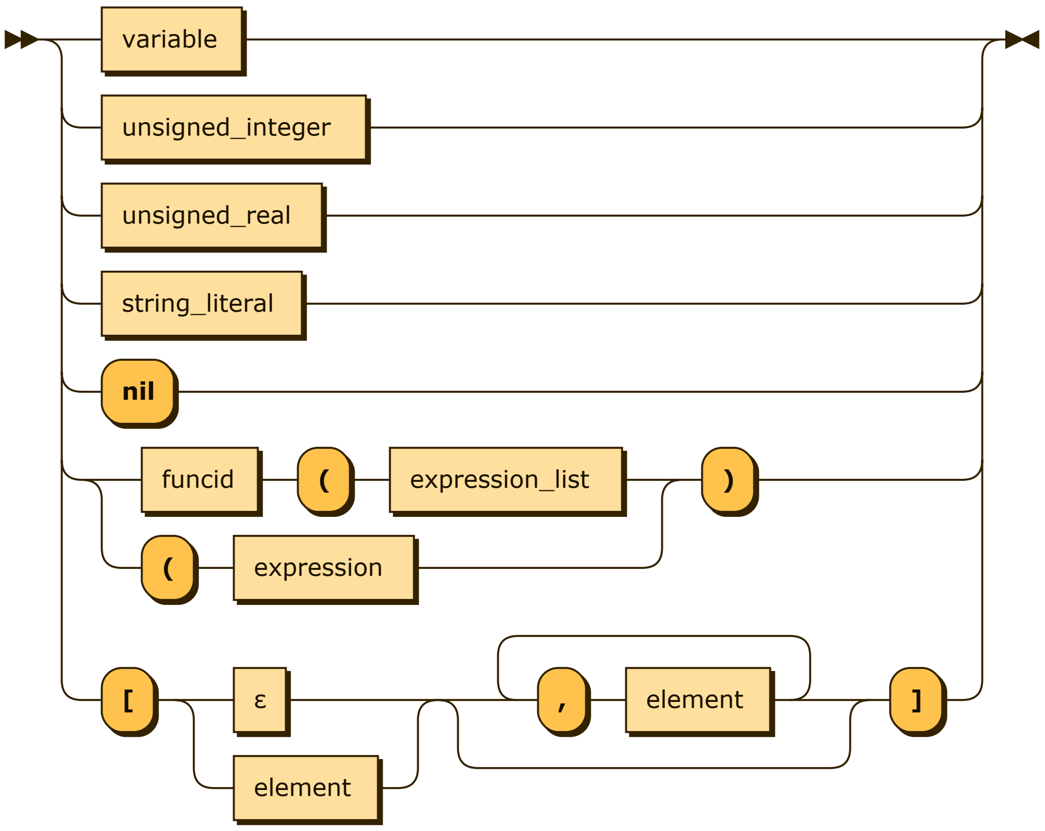
unary_expression

unary_expression ::= unary_op* primary_expression

referenced by:

- multiplicative_expression

primary_expression:



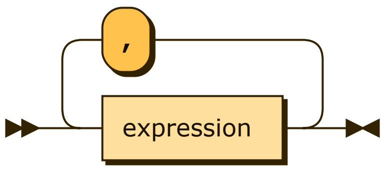
primary_expression

primary_expression ::= variable | unsigned_integer | unsigned_real | string_literal | 'nil' | (funcid '(' expression_list | '(' expression) ')' | '[' (ε | element) (',' element)* ']'

referenced by:

- unary_expression

expression_list:



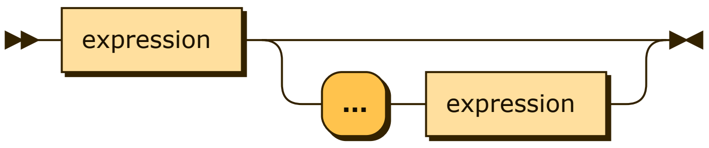
expression_list

expression_list ::= expression (',' expression)*

referenced by:

- other_statement
- primary_expression

element:



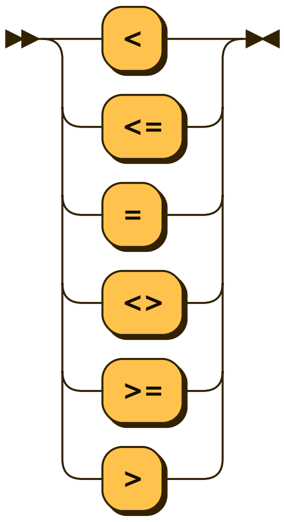
element

element ::= expression ('...' expression)?

referenced by:

- primary_expression

relational_op:



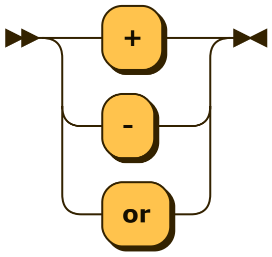
relational_op

relational_op ::= '<' | '<=' | '=' | '<>' | '>=' | '>'

referenced by:

- relational_expression

add_op:



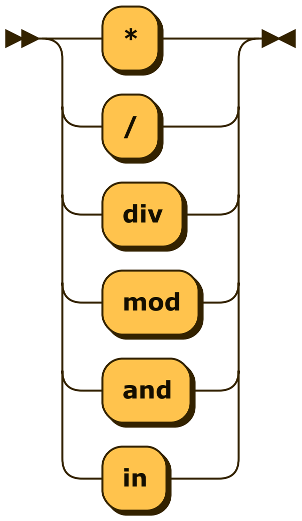
add_op

add_op ::= '+' | '-' | 'or'

referenced by:

- additive_expression

mul_op:



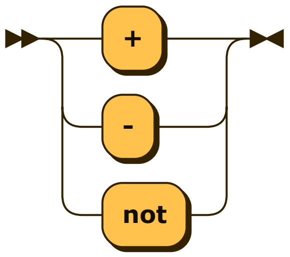
mul_op

mul_op ::= '*' | '/' | 'div' | 'mod' | 'and' | 'in'

referenced by:

- multiplicative_expression

unary_op:



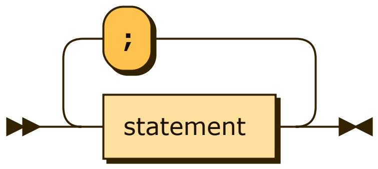
unary_op

unary_op ::= '+' | '-' | 'not'

referenced by:

- unary_expression

statement_list:



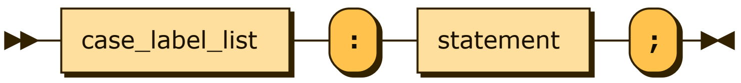
statement_list

statement_list ::= statement (';' statement)*

referenced by:

- block5
- other_statement

case_element:



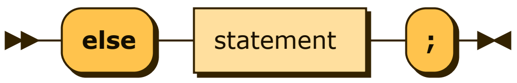
case_element

case_element ::= case_label_list ':' statement ';'

referenced by:

- other_statement

case_else:



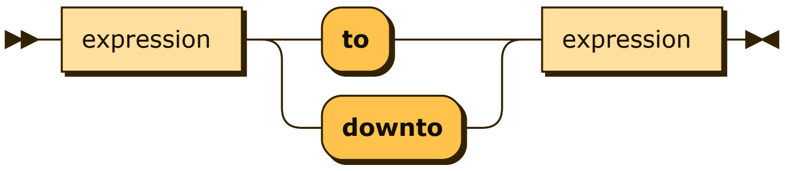
case_else

case_else ::= 'else' statement ';'

referenced by:

- other_statement

for_list:



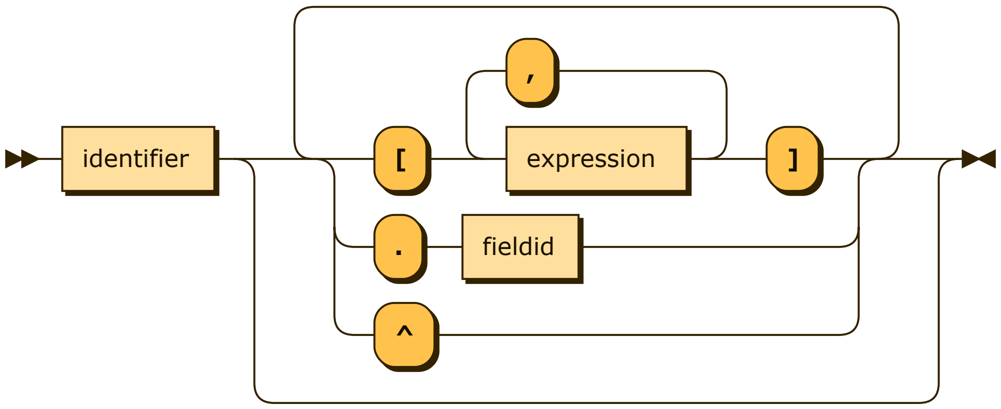
for_list

for_list ::= expression ('to' | 'downto') expression

referenced by:

- other_statement

variable:



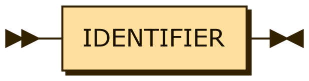
variable

variable ::= identifier ('[' expression (',' expression)* ']' | '.' fieldid | '^')*

referenced by:

- other_statement
- primary_expression

identifier:



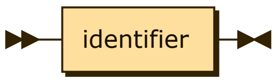
identifier

identifier ::= IDENTIFIER

referenced by:

- block1
- block2
- constid
- fieldid
- formal_parameter_section
- funcid
- identifier_list
- proc_or_func
- procid
- program
- record_field
- tag_field
- typeid
- variable
- variableid_list
- varid

funcid:



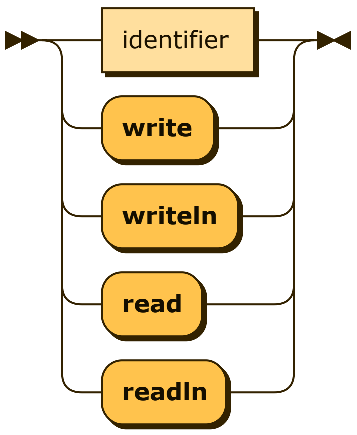
funcid

funcid ::= identifier

referenced by:

- primary_expression

procid:



procid

procid ::= identifier | 'write' | 'writeln' | 'read' | 'readln'

referenced by:

- other_statement

varid:

identifier

varid

varid ::= identifier

referenced by:

- other_statement

fieldid:

identifier

fieldid

fieldid ::= identifier

referenced by:

- variable

constid:

identifier

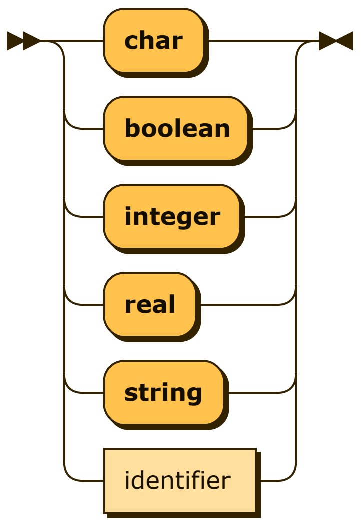
constid

constid ::= identifier

referenced by:

- constant

typeid:



typeid

typeid ::= 'char' | 'boolean' | 'integer' | 'real' | 'string' | identifier

referenced by:

- formal_parameter_section
- proc_or_func
- simple_type
- tag_field
- type

unsigned_integer:

INTEGER_LITERAL

unsigned_integer

unsigned_integer ::= INTEGER_LITERAL

referenced by:

- block
- primary_expression

unsigned_real:

REAL_LITERAL

unsigned_real

unsigned_real ::= REAL_LITERAL

referenced by:

- primary_expression

integer_literal:

integer_literal

integer_literal ::= INTEGER_LITERAL

referenced by:

- constant

real_literal:

real_literal

real_literal ::= REAL_LITERAL

referenced by:

- constant

string_literal:

string_literal

string_literal ::= STRING_LITERAL

referenced by:

- constant
- primary_expression

char_literal:

char_literal

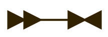
char_literal ::= CHAR_LITERAL

boolean_literal:

boolean_literal

boolean_literal ::= BOOLEAN_LITERAL

empty:



empty

empty ::=

referenced by:

- other_statement

3 Conclusão

Essa documentação descreve formalmente a gramática PascalM com precisão, auxiliando no desenvolvimento de compiladores, interpretadores ou ferramentas de análise estática.