

Gramática do Pascal Simplificado (LALG)

<PROGRAM> ::= "program" <IDENTIFIER> ";" <PROGRAM-BODY> "."

<PROGRAM-BODY> ::= <DECLARATION> “begin” <COMMANDS> “end”

$$\langle \text{DECLARATION} \rangle ::= \langle \text{CONSTANTS-DECLARATION} \rangle \langle \text{VARIABLES-DECLARATION} \rangle \langle \text{PROCEDURES-DECLARATION} \rangle$$
$$\langle \text{CONSTANTS-DECLARATION} \rangle ::= \text{"const"} \langle \text{IDENTIFIER} \rangle \text{"="} \langle \text{NUMBER} \rangle \text{";" } \langle \text{CONSTANTS-DECLARATION} \rangle \mid \lambda$$
$$\langle \text{VARIABLES-DECLARATION} \rangle ::= \text{"var"} \langle \text{VARIABLES} \rangle \text{":"} \langle \text{VARIABLES-TYPE} \rangle \text{";" } \langle \text{VARIABLES-DECLARATION} \rangle \mid \lambda$$
$$\langle \text{VARIABLES} \rangle ::= \langle \text{IDENTIFIER} \rangle \langle \text{OTHER-VARIABLES} \rangle$$
$$\langle \text{OTHER-VARIABLES} \rangle ::= \text{" , " } \langle \text{VARIABLES} \rangle \mid \lambda$$
$$\langle \text{VARIABLES-TYPE} \rangle ::= \text{"real"} \mid \text{"integer"}$$

<PROCEDURES-DECLARATION> ::= “**procedure**” <IDENTIFIER> <PARAMETERS> “,”
 < PROCEDURE-BODY> <PROCEDURES-DECLARATION> | λ

$$\langle \text{PARAMETERS} \rangle ::= "(" \langle \text{PARAMETERS-LIST} \rangle ")" \mid \lambda$$

<PARAMETERS-LIST> ::= <VARIABLES> ":" <VARIABLES-TYPE> <OTHER-PARAMETERS>

$$\langle \text{OTHER-PARAMETERS} \rangle ::= \text{";" } \langle \text{PARAMETERS-LIST} \rangle \mid \lambda$$

<PROCEDURE-BODY> ::= <LOCAL-DECLARATIONS> “begin” <COMMANDS> “end” “;”

$$\langle \text{LOCAL-DECLARATIONS} \rangle ::= \langle \text{VARIABLES-DECLARATION} \rangle$$
$$\langle \text{ARGUMENTS-LIST} \rangle ::= \text{"("} \langle \text{ARGUMENTS} \rangle \text{"} \mid \lambda$$
$$\langle \text{ARGUMENTS} \rangle ::= \langle \text{IDENTIFIER} \rangle \langle \text{OTHER-IDENTIFIERS} \rangle$$
$$\langle \text{OTHER-IDENTIFIERS} \rangle ::= ":" \langle \text{ARGUMENTS} \rangle \mid \lambda$$
$$\langle \text{COMMANDS} \rangle ::= \langle \text{COMMAND} \rangle ";" \langle \text{COMMANDS} \rangle \mid \lambda$$

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<COMMAND> ::= "readln" "(" <VARIABLES> ")" |
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"writeln" "(" <VARIABLES> ")" |

“repeat” <COMMANDS> **“until”** <CONDITION> |

"while" "(" <CONDITION> ")" "do" <COMMANDS> "end"

"if" <CONDITION> **"then"** <COMMAND> <FALSE-CONDITION> |

<IDENTIFIER> “:=” <ATtribution>

$$\langle \text{ATTRIBUTE} \rangle ::= \langle \text{EXPRESSION} \rangle \mid \langle \text{ARGUMENTS-LIST} \rangle$$

“begin” <COMMANDS> “end”

$$\langle \text{CONDITION} \rangle ::= \langle \text{EXPRESSION} \rangle \langle \text{RELATION} \rangle \langle \text{EXPRESSION} \rangle$$
$$\langle \text{FALSE-CONDITION} \rangle ::= \text{"else"} \langle \text{COMMAND} \rangle \mid \lambda$$
$$\langle \text{RELATION} \rangle ::= "=" \mid "<" \mid ">=" \mid "<=" \mid ">" \mid "<"$$
$$\langle \text{EXPRESSION} \rangle ::= \langle \text{TERM} \rangle \langle \text{OTHER-TERMS} \rangle$$
$$\langle \text{TERM} \rangle ::= \langle \text{UNARY-OPERATOR} \rangle \langle \text{FACTOR} \rangle \langle \text{OTHER-FACTORS} \rangle$$
$$\langle \text{UNARY-OPERATOR} \rangle ::= "+" \mid "-" \mid \lambda$$
$$\langle \text{OTHER-TERMS} \rangle ::= \langle \text{SUM-OPERATORS} \rangle \langle \text{TERM} \rangle \langle \text{OTHER-TERMS} \rangle \mid \lambda$$
$$\langle \text{SUM-OPERATORS} \rangle ::= "+" \mid "-"$$
$$\langle \text{OTHER-FACTORS} \rangle ::= \langle \text{MULTIPLIER-OPERATORS} \rangle \langle \text{FACTOR} \rangle \langle \text{OTHER-FACTORS} \rangle \mid \lambda$$

<MULTIPLIER-OPERATORS> ::= "*" | "/"

$$\langle \text{FACTOR} \rangle ::= \langle \text{IDENTIFIER} \rangle \mid \langle \text{NUMBER} \rangle \mid \text{"("} \langle \text{EXPRESSION} \rangle \text{"}"}$$
$$\langle \text{NUMBER} \rangle ::= \langle \text{INTEGER-NUMBER} \rangle \mid \langle \text{REAL-NUMBER} \rangle$$