

Bold - Non-Terminal

Not bold - Terminal

Parenthesis() in the grammar do **NOT** represent actual characters in the grammar; they are used to distinguish the grammars

Program -> (**Function Program**) | ϵ

Ident -> IDENT

Identifiers -> **Ident** | (**Ident** COMMA **Identifiers**)

Function -> FUNCTION **Ident** SEMICOLON BEGIN_PARAMS **Declarations**

END_PARAMS BEGIN_LOCALS **Declarations** END_LOCALS BEGIN_BODY **Statements**

END_BODY

Declarations -> (**Declaration** SEMICOLON **Declarations**) | ϵ

Declaration -> (**Identifiers** COLON ARRAY L_SQUARE_BRACKET NUMBER

R_SQUARE_BRACKET OF INTEGER) | (**Identifiers** COLON INTEGER)

Statements -> (**Statement** SEMICOLON **Statements**) | (**Statement** SEMICOLON)

Statement -> Var Assign **Expression** |

IF **bool_exp** THEN **Statements** ENDIF |

IF **bool_exp** THEN **Statements** ELSE **Statements** ENDIF |

WHILE **bool_exp** BEGINLOOP **Statements** ENDLOOP |

DO BEGINLOOP **Statements** ENDLOOP WHILE **bool_exp** |

READ **Vars** |

WRITE **Vars** |

BREAK |

RETURN **Expression**

Vars -> **Var** | (**Var** COMMA **Vars**)

Var -> **Ident** | (**Ident** L_SQUARE_BRACKET **Expression** R_SQUARE_BRACKET)

bool_exp -> **rAndExp** | (**rAndExp** OR **bool_exp**)

rAndExp -> **rExpN** | (**rExpN** AND **rAndExp**)

rExpN -> (NOT **rExp**) | **rExp**

rExp -> (**Expression** **Comp** **Expression**) |

TRUE |

FALSE |

L_PAREN **bool_exp** R_PAREN

Comp -> EQ |

NEQ |

GT |

LT |

GTE |

LTE

Expression -> **multExp** |

multExp ADD **Expression** |

multExp SUB **Expression**

Expressions -> **Expression** |

Expression COMMA **Expressions** |

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multExp -> **Term** |

Term MULT **multExp** |

Term DIV multExp |

Term MOD multExp

Term -> Var |

SUB Var |

NUMBER |

SUB NUMBER |

L_PAREN Expression R_PAREN |

SUB L_PAREN Expression R_PAREN |

Ident L_PAREN Expressions R_PAREN