Context Free Grammar:

```
Program                         : MethodsList
                                | /* EMPTY */
MethodsList               : Method MethodsList
                                | Method
Method                    :     Type ID ( Parameters )
                                |      Type [ ] ID ( Parameters )
Parameters                : Formals Type ID
                                | Formals Type ID [ ]
                                | /* EMPTY */
Formals                   : Formals Type ID ,
                                | Formals Type ID [ ] ,
                                | /* EMPTY */
Type                      : INT
                                | REAL
                                | CHAR
Body                      : { Declarations Statements }
Declarations         : DeclarationsList Declaration
                                | /* EMPTY */
DeclarationsList: DeclarationsList Declaration
                                | /* EMPTY */
Declaration               :     Type ID
                                |      Type ID [ INT_CONST ]
                                |      Type ID = Expression
Variables                 :     , ID
                                |      , ID [ INT_CONST ]
                                |      , ID = Expression
                                | /* EMPTY */
Statements                : Statements Statement
                                | /* EMPTY */
IncDec                    : Location INCREASE_SIGN
                                | ArrayName INCREASE_SIGN
                                | INCREASE_SIGN Location
                                | INCREASE_SIGN ArrayName
                                | Location DECREASE_SIGN
                                | ArrayName DECREASE_SIGN
                                | DECREASE_SIGN Location
                                | DECREASE_SIGN ArrayName
ChangeAssignSymbol   : PLUS_EQUALS_SIGN
                                | MINUS_EQUALS_SIGN
```

```
                                  | TIMES_EQUALS_SIGN
                                  | DIVIDE_EQUALS_SIGN
SimpleStatement             : Assign
                                  |  AssignMultiple
                                  | IncDec
                                  | Location ChangeAssignSymbol Expression
                                  | ArrayName ChangeAssignSymbol Expression
                                  | BREAK
                                  | READ Location
                                  | READ TEXT , Location
                                  | PRINT Message
                                  | PRINTLN Message
Statement                   : SimpleStatement ;
                                  | RETURN Expression ;
                                  | IF Code1 ( Expression ) Statement
                                  |      IF Code1 ( Expression ) Statement ELSE
                                  |      WHILE
                                  |      REPEAT
                                  |      FOR
                                  | SimpleStatement UNLESS Expression ;
                                  | Block
                                  | ;
Message                           : Printable MoreMessage
MoreMessage                 : , Printable MoreMessage
                                  | /* EMPTY */
Printable                   : TEXT
                                  | Expression
Block                       : { Statements }
Assign                      : Location = Expression
                                  | Location = Assign
                                  | ArrayName = Expression
                                  | ArrayName = Assign
AssignMultiple         : Location , NestedAssign , Expression
                                  | ArrayName , NestedAssign , Expression
NestedAssign           : Location , NestedAssign , Expression
                                  | ArrayName , NestedAssign , Expression
                                  | Location = Expression
                                  | ArrayName = Expression
MethodName                  : ID
Location                    : ID
ArrayName                   : ID [ Expression ]
Expression                  : Expression OR AndExpression
```

```
                                        | AndExpression
AndExpression           : AndExpression AND RelationExpression
                                        | RelationExpression
RelationExpression      : AddExpression RelationOperator AddExpression
                                        | AddExpression
RelationOperator        : IS_LESS_OR_EQUAL
                                        | <
                                        | >
                                        | IS_GREATER_OR_EQUAL
                                        | IS_EQUAL
                                        | IS_NOT_EQUAL
AddExpression           : AddExpression AddOperator Term
                                        | Term
AddOperator                     : +
                                        | -
Term                            : Term MultiplyOperator Factor
                                        | Factor
                                        | NOT_SIGN Factor
MultiplyOperator        : *
                                        | /
                                        | %
Factor                          : ( Expression )
                                        | Location
                                        | ArrayName
                                        | INT_CONST
                                        | - INT_CONST
                                        | REAL_CONST
                                        | - REAL_CONST
                                        | TRUE
                                        | FALSE
                                        | CHAR_CONST
                                        | MethodName ( Actuals )
                                        | IncDec
Actuals                         : Arguments Expression
                                        | /* EMPTY */
Arguments                       : Arguments Expression ,
                                        | /* EMPTY */
```