**grammar**

Start symbol: Program

|  |  |
| --- | --- |
| Program | ::= DeclarationList |
| DeclarationList | ::= DeclarationList declaration  | Declaration |
| Declaration | ::= VarDeclaration  | OprDeclaration  | ε |
| VarDeclaration | ::= **Identifier: Type** **;**  | **Identifier: Type** = Literal**;**  | CollectionDeclaration |
| CollectionDeclaration | ::= **Identifier: col <Type> {** NumberLiteral **};**  | **Identifier: col** **<Type> {** **Identifier** **};**  | **Identifier: col** **<Type>** **=** CollectionLiteral**;** |
| OprDeclaration | ::= **Type** **opr** **Identifier** **(** IdList **)** Block **send** Expression **;** |
| Block | ::= **[** VarDeclarations StatementsList **]** |
| IdList | ::= **Identifier** IdListTail  | Literal IdListTail  | ε |
| IdListTail | ::= **,** **Identifier** IdListTail  |**,** Literal IdListTail  | ε |
| StatementsList | ::= Statement  | StatementsList Statement |
| Statement | ::= Expression **;**  | **?** **(** Expression **)** Block  | **until** **(** Expression **)** Block  | **out** **<=** Expression **;**  | **in** **=>** Expression **;**  | ε |
| Expression | ::= Primary  | Expression **Operator** Primary |
| Primary | ::= **Identifier**  | **Identifier** **(** ExpressionList **)** function call  | **Operator** Primary  | **Literal**  | **(** Expression **)** |
| Literal | ::= **NumberLiteral**  | **LetterLiteral**  | **StateLiteral**  | CollectionLiteral |
| CollectionLiteral | ::= **<** IdList **>** |
| ExpressionList | ::= Expression ExpressionListTail  | ε |
| ExpressionListTail | ::= **,** Expression ExpressionListTail  | ε |

|  |  |
| --- | --- |
| ***Tokens*** |  |
| **Identifier** | **Letter** ( **Letter** | **Digit**)\* |
| **NumberLiteral** | **Digit** (**Digit**)\* |
| **LetterLiteral** | **Letter** |
|  |  |
| **StateLiteral** | ::= **true**  | **false** |
| **Digit** | ::= **0** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** |
| **Letter** | := **a** | **b** | ... | **z** | **A** | **B** | ... |**Z** |
| **Operator** | ::= **+** | **-** | **\*** | **/** | **>** | **<** | **=** | **==** | **!**  | **&** | **|** | **--** | **<<** | **>>** | **//** | **‘** |
| **Type** | ::= **number**  | **letter**  | **state**  | **col**  | **void** |
| **opr** |  |
| **send** |  |
| **Until** |  |
| **Out** |  |
| **In** |  |
| **?** |  |
| **(** |  |
| **)** |  |
| **[** |  |
| **]** |  |
| **{** |  |
| **}** |  |
| **<** |  |
| **>** |  |
| **;** |  |
| **:** |  |
| **,** |  |