⟨*S'*⟩ ::= ⟨*Program*⟩

⟨*Program*⟩ ::= ⟨*Statements*⟩

⟨*Statements*⟩ ::= ⟨*Statement*⟩
| ⟨*Statements*⟩ ⟨*Statement*⟩

⟨*Statement*⟩ ::= ⟨*Import*⟩
| ⟨*Input*⟩
| ⟨*Type*⟩
| ⟨*Signature*⟩
| ⟨*Grammar*⟩
| ⟨*ShortAlgebra*⟩
| ⟨*Algebra*⟩
| ⟨*PrefixAlgebra*⟩
| ⟨*ExtendedAlgebra*⟩
| ⟨*Instance*⟩

⟨*Import*⟩ ::= `IMPORT` `IDENTIFIER`

⟨*Input*⟩ ::= `INPUT` ⟨*Item*⟩

⟨*Type*⟩ ::= `TYPE` `IDENTIFIER` `ASSIGN` ⟨*Word*⟩

⟨*Signature*⟩ ::= `SIGNATURE` ⟨*SigName*⟩ ⟨*SigContent*⟩

⟨*SigName*⟩ ::= `IDENTIFIER` `LPAREN` ⟨*ListParam*⟩ `RPAREN`

⟨*SigContent*⟩ ::= `LBRACE` ⟨*SigElements*⟩ `RBRACE`

⟨*SigElements*⟩ ::= ⟨*SigElement*⟩
| ⟨*SigElement*⟩ ⟨*SigElements*⟩

⟨*SigElement*⟩ ::= `IDENTIFIER` ⟨*IdListParam*⟩ `SEMI`
| `CHOICE` ⟨*BrackListParam*⟩ `IDENTIFIER` `LPAREN` ⟨*BrackListParam*⟩ `RPAREN` `SEMI`

⟨*Grammar*⟩ ::= `GRAMMAR` ⟨*GrammarPreamble*⟩ ⟨*ParenListArgs*⟩ ⟨*GrammarContent*⟩
| `GRAMMAR` ⟨*GrammarPreamble*⟩ ⟨*error*⟩ ⟨*GrammarContent*⟩

⟨*GrammarPreamble*⟩ ::= `IDENTIFIER` `USES` `IDENTIFIER`

⟨*GrammarContent*⟩ ::= `LBRACE` ⟨*GrammarStatement*⟩ ⟨*GrammarRules*⟩ `RBRACE`

⟨*ParenListArgs*⟩ ::= `LPAREN` ⟨*ListArgs*⟩ `RPAREN`

⟨*GrammarStatement*⟩ ::= `TABULATED` `LBRACE` ⟨*Rhs*⟩ `RBRACE`
| ⟨*Empty*⟩

⟨*GrammarRules*⟩ ::= ⟨*GrammarRule*⟩
  | ⟨*GrammarRule*⟩ ⟨*GrammarRules*⟩

⟨*GrammarRule*⟩ ::= IDENTIFIER ASSIGN ⟨*Rhs*⟩ SEMI
  | IDENTIFIER ASSIGN ⟨*Rhs*⟩ WITH ⟨*Word*⟩ HASH IDENTIFIER SEMI
  | IDENTIFIER ASSIGN ⟨*Rhs*⟩ HASH IDENTIFIER SEMI

⟨*Rhs*⟩ ::= ⟨*RhsElem*⟩ PIPE ⟨*Rhs*⟩
  | ⟨*RhsElem*⟩ COMMA ⟨*Rhs*⟩
  | ⟨*RhsElem*⟩

⟨*RhsElem*⟩ ::= ⟨*FuncEval*⟩
  | LBRACE ⟨*Rhs*⟩ RBRACE

⟨*FuncEval*⟩ ::= ⟨*Word*⟩
  | ⟨*Word*⟩ ⟨*ParenListItems*⟩
  | ⟨*Word*⟩ ⟨*ParenListItems*⟩ WITH ⟨*FuncEval*⟩

⟨*ParenListItems*⟩ ::= LPAREN ⟨*ListItems*⟩ RPAREN
  | LPAREN RPAREN

⟨*Instance*⟩ ::= INSTANCE IDENTIFIER ASSIGN IDENTIFIER LPAREN ⟨*Expressions*⟩
    RPAREN SEMI

⟨*Expressions*⟩ ::= LPAREN ⟨*Expressions*⟩ RPAREN
  | IDENTIFIER
  | ⟨*Expressions*⟩ PLUS ⟨*Expressions*⟩
  | ⟨*Expressions*⟩ MINUS ⟨*Expressions*⟩
  | ⟨*Expressions*⟩ MULT ⟨*Expressions*⟩
  | ⟨*Expressions*⟩ DIV ⟨*Expressions*⟩
  | ⟨*Expressions*⟩ MOD ⟨*Expressions*⟩
  | ⟨*Expressions*⟩ PIPE ⟨*Expressions*⟩
  | ⟨*Expressions*⟩ SUCHTHAT IDENTIFIER

⟨*ShortAlgebra*⟩ ::= ALGEBRA IDENTIFIER AUTO IDENTIFIER SEMI

⟨*PrefixAlgebra*⟩ ::= ⟨*Word*⟩ ⟨*Algebra*⟩

⟨*Algebra*⟩ ::= ALGEBRA ⟨*AlgebraPreamble*⟩ ⟨*ParenListArgs*⟩ ⟨*AlgebraContent*⟩

⟨*ExtendedAlgebra*⟩ ::= ALGEBRA IDENTIFIER EXTENDS IDENTIFIER ⟨*AlgebraContent*⟩

⟨*AlgebraPreamble*⟩ ::= ⟨*Word*⟩ IMPLEMENTS IDENTIFIER

⟨*AlgebraContent*⟩ ::= LBRACE ⟨*AlgebraElements*⟩ RBRACE

⟨*AlgebraElements*⟩ ::= ⟨*AlgebraElement*⟩
| ⟨*AlgebraElement*⟩ ⟨*AlgebraElements*⟩

⟨*AlgebraElement*⟩ ::= ⟨*AlgebraSig*⟩ `LBRACE` ⟨*AlgebraStatements*⟩ `RBRACE`
| ⟨*AlgebraChoice*⟩ `LBRACE` ⟨*AlgebraStatements*⟩ `RBRACE`

⟨*AlgebraChoice*⟩ ::= `CHOICE` ⟨*BrackID*⟩ ⟨*Word*⟩ `LPAREN` ⟨*BrackID*⟩ `IDENTIFIER` `RPAREN`
| `IDENTIFIER` `CHOICE` ⟨*BrackID*⟩ ⟨*Word*⟩ `LPAREN` ⟨*BrackID*⟩ `IDENTIFIER` `RPAREN`

⟨*BrackID*⟩ ::= `LBRACK` ⟨*Word*⟩ `RBRACK`

⟨*AlgebraSig*⟩ ::= ⟨*Word*⟩ `IDENTIFIER` ⟨*ListTypesIncludeVoidParen*⟩

⟨*ListTypesIncludeVoid*⟩ ::= `IDENTIFIER`
| ⟨*ListTypes*⟩

⟨*ListTypes*⟩ ::= ⟨*Types*⟩
| ⟨*Types*⟩ `COMMA` ⟨*ListTypes*⟩

⟨*Types*⟩ ::= ⟨*Word*⟩ `IDENTIFIER`

⟨*AlgebraStatements*⟩ ::= ⟨*AlgebraStatement*⟩
| ⟨*AlgebraStatement*⟩ ⟨*AlgebraStatements*⟩

⟨*AlgebraStatement*⟩ ::= `IDENTIFIER` `IDENTIFIER` `SEMI`
| `IDENTIFIER` ⟨*ParenListItems*⟩ `SEMI`
| `IDENTIFIER` `ASSIGN` ⟨*ComplexExpression*⟩ `SEMI`
| `RETURN` ⟨*ComplexExpression*⟩ `SEMI`

⟨*ListComplexExpression*⟩ ::= ⟨*Empty*⟩
| ⟨*ComplexExpression*⟩
| ⟨*ComplexExpression*⟩ `COMMA` ⟨*ListComplexExpression*⟩

⟨*ComplexExpression*⟩ ::= `IDENTIFIER` `LPAREN` ⟨*ListComplexExpression*⟩ `RPAREN`
| `IDENTIFIER`
| `SCONST`
| `ICONST`
| `FCONST`
| `LBRACE` `IDENTIFIER` `LPAREN` ⟨*ListComplexExpression*⟩ `RPAREN` `RBRACE`
| `COMP_OP_LEFT` ⟨*ListItem2*⟩ `COMP_OP_RIGHT`
| `LPAREN` ⟨*ListComplexExpression*⟩ `RPAREN`
| ⟨*ComplexExpression*⟩ `PLUS` ⟨*ComplexExpression*⟩
| ⟨*ComplexExpression*⟩ `MULT` ⟨*ComplexExpression*⟩
| ⟨*ComplexExpression*⟩ `MINUS` ⟨*ComplexExpression*⟩
| ⟨*ComplexExpression*⟩ `DIV` ⟨*ComplexExpression*⟩
| ⟨*ComplexExpression*⟩ `MOD` ⟨*ComplexExpression*⟩

⟨*ListTypesIncludeVoidParen*⟩ ::= LPAREN ⟨*ListTypesIncludeVoid*⟩ RPAREN

⟨*ListParam*⟩ ::= ⟨*Word*⟩
| ⟨*Word*⟩ COMMA
| ⟨*Word*⟩ COMMA ⟨*ListParam*⟩

⟨*ListArgs*⟩ ::= ⟨*Word*⟩ ASSIGN ⟨*Word*⟩
| ⟨*Word*⟩ ASSIGN ⟨*Word*⟩ COMMA ⟨*ListArgs*⟩

⟨*ListItems*⟩ ::= ⟨*Item*⟩
| ⟨*Item*⟩ COMMA
| ⟨*Item*⟩ COMMA ⟨*ListItems*⟩

⟨*FollowUpIdentifier*⟩ ::= WITH ⟨*FuncEval*⟩
| ⟨*ParenListItems*⟩

⟨*Item*⟩ ::= IDENTIFIER
| IDENTIFIER ⟨*FollowUpIdentifier*⟩
| SCONST
| ICONST
| FCONST
| LBRACE IDENTIFIER ⟨*FollowUpIdentifier*⟩ RBRACE
| COMP_OP_LEFT ⟨*ListItem2*⟩ COMP_OP_RIGHT

⟨*ListItem2*⟩ ::= ⟨*Word*⟩
| ⟨*Word*⟩ COMMA
| ⟨*Word*⟩ COMMA ⟨*ListItem2*⟩

⟨*IdListParam*⟩ ::= IDENTIFIER ⟨*ParenListItems*⟩

⟨*BrackListParam*⟩ ::= LBRACK ⟨*ListParam*⟩ RBRACK

⟨*Word*⟩ ::= IDENTIFIER
| ⟨*FuncWords*⟩
| ⟨*ReservedWord*⟩

⟨*FuncWords*⟩ ::= ALL

⟨*ReservedWord*⟩ ::= ANSWER
| AUTO
| AXIOM
| CHOICE
| CLASSIFY
| ELSE
| EQUAL
| EXTENDS
| EXTERN

```
  | FOR
  | IF
  | IMPLEMENTS
  | OVERLAY
  | RETURN
  | SUCHTHAT
  | SYNOPTIC
  | TABULATED
  | TYPE
```

⟨*Empty*⟩ ::= ⟨¡*empty*⟩¿