## Attribute Grammar

### Attributes

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Symbol | Attribute Name | Java Type | Inherited/Synthesized | Description |
| VarDefinition | scope | ENUM {  GLOBAL,  LOCAL,  PARAMETER } | Inherited |  |
| Variable | definition | VarDefinition | Synthesized |  |
| FunctionDefinition | Builder | FunctionBuilder |  |  |
| FunctionCallSent | Definition |  |  |  |
| FunctionCallExpr | Definition |  |  |  |
| FieldDefinition | fieldOwner | StructType |  |  |

### Rules

|  |  |  |
| --- | --- | --- |
| Node | Predicates | Semantic Functions |
| intType:type → ε |  |  |
| doubleType:type → ε |  |  |
| charType:type → ε |  |  |
| voidType:type → ε |  |  |
| structType:type → name:string |  |  |
| arrayType:type → dimension:intConstant tipo:type |  |  |
| program → name:string types:structDefinition\* vars:varDefinition\* builders:string\* features:functionDefinition\* runCall:functionCallSent |  |  |
| structDefinition → name:structType fields:fieldDefinition\* |  |  |
| functionDefinition → name:string params:varDefinition\* returnType:type? vars:varDefinition\* sentences:sentence\* |  |  |
| functionCallSent:sentence → name:string args:expression\* |  |  |
| assignment:sentence → left:expression right:expression |  |  |
| loop:sentence → from:assignment\* until:expression body:sentence\* |  |  |
| ifElse:sentence → condition:expression trueBlock:sentence\* falseBlock:sentence\* |  |  |
| read:sentence → input:expression\* |  |  |
| print:sentence → input:expression\* |  |  |
| println:sentence → input:expression\* |  |  |
| return:sentence → value:expression? |  |  |
| intConstant:expression → value:string |  |  |
| realConstant:expression → value:string |  |  |
| charConstant:expression → value:string |  |  |
| variable:expression → name:string |  |  |
| castExpr:expression → castType:type value:expression |  |  |
| arithmeticExpr:expression → op1:expression operator:string op2:expression |  |  |
| logicalExpr:expression → op1:expression operator:string op2:expression |  |  |
| comparationExpr:expression → op1:expression operator:string op2:expression |  |  |
| minusExpr:expression → op:expression |  |  |
| notExpr:expression → op:expression |  |  |
| functionCallExpr:expression → name:string args:expression\* |  |  |
| fieldAccess:expression → root:expression field:string |  |  |
| arrayAccess:expression → array:expression index:expression |  |  |
| fieldDefinition → name:string tipo:type |  |  |
| varDefinition → name:string tipo:type |  |  |

Operators samples (cut & paste if needed):  
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### Auxiliary Data Structures

|  |  |  |
| --- | --- | --- |
| Symbol | Java Type | Description |
| variables | ContextMap<String, VarDefinition> | Conjunto de las variables declaradas |
| builders | List<String> | Lista de los nombres declarados en el bloque ‘create’, es decir, los constructores declarados (FunctionBuilder) |
| functions | Map<String, FunctionDefinition> | Conjunto de las funciones definidas |
| defTypes | Map<String, StructDefinition> | Conjunto de los structs (defTuple) declarados |