

# Mini Java Grammar

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Program ::= MainClassDecl ClassDeclList

MainClassDecl ::= class ID { public static void main (String[ ] ID) { StmtList } }

ClassDeclList = ClassDecl ClassDeclList  
|  $\epsilon$

ClassDecl ::= class ID [extends ID] { ClassVarDeclList MethodDeclList }

ClassVarDeclList = ClassVarDecl ClassVarDeclList  
|  $\epsilon$

ClassVarDecl ::= Type ID;

MethodDeclList = MethodDecl MethodDeclList  
|  $\epsilon$

MethodDecl ::= public Type ID ( [Formal FormalList] ) { StmtList return Expr; }

FormalList = , Formal FormalList  
|  $\epsilon$

Formal ::= Type ID

Type ::= int | boolean | ID

StmtList = Stmt StmtList  
|  $\epsilon$

Stmt ::= if (Expr) BracketStmt else BracketStmt  
| while (Expr) BracketStmt  
| AtomicStmt

BracketStmt ::= { AtomicStmtList }  
| AtomicStmt

AtomicStmtList = AtomicStmt AtomicStmtList  
|  $\epsilon$

AtomicStmt ::= Type ID = Expr;  
| System.out.println(Expr);  
| ID = Expr;

$$\text{ExprList} = , \text{Expr ExprList} \\ | \epsilon$$

$$\text{Expr} ::= \text{LogicalOperand Expr'}$$

$$\text{Expr'} ::= || \text{LogicalOperand Expr'} \\ | \&\& \text{LogicalOperand Expr'} \\ | \epsilon$$

$$\text{LogicalOperand} ::= \text{EqualityOperand LogicalOperand'}$$

$$\text{LogicalOperand'} ::= == \text{EqualityOperand LogicalOperand'} \\ | != \text{EqualityOperand LogicalOperand'} \\ | \epsilon$$

$$\text{EqualityOperand} ::= \text{RelOperand EqualityOperand'}$$

$$\text{EqualityOperand'} ::= < \text{RelOperand EqualityOperand'} \\ | <= \text{RelOperand EqualityOperand'} \\ | >= \text{RelOperand EqualityOperand'} \\ | > \text{RelOperand EqualityOperand'} \\ | \epsilon$$

$$\text{RelOperand} ::= \text{AddOperand RelOperand'}$$

$$\text{RelOperand'} ::= + \text{AddOperand RelOperand'} \\ | - \text{AddOperand RelOperand'} \\ | \epsilon$$

$$\text{AddOperand} ::= \text{MulOperand AddOperand'}$$

$$\text{AddOperand'} ::= * \text{MulOperand AddOperand'} \\ | / \text{MulOperand AddOperand'} \\ | \epsilon$$

$$\text{MulOperand} ::= ! \text{UnaryOperand} \\ | - \text{UnaryOperand} \\ | \text{UnaryOperand}$$

$$\text{UnaryOperand} ::= ( \text{ParenOperand} ) \\ | \text{ParenOperand}$$

$$\text{ParenOperand} ::= \text{Value} . \text{ID} ( [\text{Expr ExprList}] ) \\ | \text{Value}$$

$$\text{Value} ::= \text{new ID} ( ) \\ | \text{ID} \\ | \text{this}$$

| Integer  
| null  
| true  
| false